A COMPUTERISED HOUSE ALLOCATION SYSTEM

(A CASE STUDY OF NIGER STATE HOUSING CORPORATION)

BY

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This project work is submitted to the department of mathematics/computer science in partial fulfilment of the requirements for the award of POST GRADUATE DIPLOMA IN COMPUTER SCIENCE. FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA NIGER STATE

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CERTIFICATION

This is to certify that the project titled computerized house allocation system (A case study of Niger State Housing Corporation) is an original work undertaken by **AHMAD MUHAMMAD YABAGI (PGD/MCS/2000/2001/980 OF THE DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE. FUT/Minna.** This work has not been presented either in part or full elsewhere for the award of any degree.

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DEDICATION

I dedicate the project to my parent who supported me with prayers.

ACKNOWLEDGEMENT

ABSTRACT

Housing is of prime importance to man on account of its necessity, this issue of housing has always posed major problems.

The Niger State Housing Corporation was established with the aim of providing shelter to the generality of people. As we all know that management is the co-ordination of resources in the best way for organisation to achieve its objectives.

Human and physical resource's management system of a Building Industry involves allocation houses, and maintenance. Handling this operation manually has some problem such as slow response to information retrieval, Biasness and so on.

Resource allocation in the context of this project work is the generation of random numbers as an approach to allocation of House to applicants. Using Q-basic programming language, the program is designed in such a way that the Estate department supplied all the data on the way the house should be allocated, in percentages (%) to each category of applicant without bias.

TABLE OF CONTENTS

CHAPTER ONE
GENERAL INTRODUCTION

CHAPTER TWO
THE CASE STUDY

CHAPTER THREE

SYSTEM ANALYSIS DESIGN

CHAPTER FOUR

SOFTWARE DESIGN AND IMPLEMENTATION

CHAPTER FIVE

CONCLUSION

CHAPTER ONE

GENERAL INTRODUCTION

1.0 INTRODUCTION

A computer is essentially an electronic device which processes data supplied through any available input device into information which can be stored in its memory or communicated to the user vie any available output device, thus, an interface has to exist between the computer itself and the raw material, and to understand the information produced by processing the raw material.

Computer Technology has evolved through several generations. Each generation has affected data processing, because it has and will continue to have effect on man, job and the entire society.

When trying to figure out the various events, discoveries and invention, which had taken place up the success in the development of a modern day ultra fast computer required an intensive analysis of computational mathematics and other relevant fields of study.

1.1 HISTORY OF COMPUTER

Computer is an electronic machine which is capable of processing data in a wide variety of ways with an extremely high degree of speed and accuracy.

However, all the processes were hard and extremely difficult to keep an accurate record, one of the earliest calculating device created by man was ABACUS. This was attributed to Chinese around 1642, Edmud Gun then invented a forerunner of slide rule in 1620 which was used for the next two centuries to perform mathematical operations.

The development of the first real mechanical calculating device was built by a 19 year old Frenchman, called Blaise Pascal. He called the machine that could not only add and subtract numbers but can also multiply, divides and calculate square roots of numbers in 1674. This formed the basis of many mechanical calculators. By 1920 electromagnetic devices came into being. Since that time the technology used by the computer manufacturers to design and produce computer has accelerated and influenced by research trends in Artificial intelligence (AI), speech, processing, parallel architecture, pattern recognition and expert system (ES), with all these, computers are reduced to smaller sizes and has increased memory and storage capacity.

1.2 CLASSIFICATION OF COMPUTER

Computer comes in a wide variety of sizes, ranging from tiny hand held devices to some that are several meters in height and diameter. Here we classify computers by size, type of logic they use and by purpose.

1.2.1 CLASSIFICATION BY SIZE

Computers are divided into four categories:-

i.   Mainframe computers

ii.   Mini computers

iii.   Micro computers

iv.   Super computers

i.   **Mainframe computer:-** It is a large computer commonly used in business and industry, it is used to solve highly sophisticated problems and it has a large memory capacity and operate at a very high speed they can support multiple users and multiple functions.

ii.   **Mini computer:-** This type of computer has many of the capabilities of a mainframe computers, it is generally low price with smaller primary storage, though it supports a network of users terminals.

3

iii. **Micro computer:-** This type of computer often found in small business, classrooms and houses, they are less complex and execute programs at slower speed.

iv. **Super computer:-** They are the most powerful machines available in the mid-1980. The are very fast and most expensive, it has the capacity to process seismic data generated during crude oil seeking exploration.

1.2.2 CLASSIFICATION BY LOGIC

Computer's interims of logic can be classified into three main types:-

a. Analog computer

b. Digital computer

c. Hybrid computer

(a) **Analog computer:-** This type of computer performs its operation by measuring and comparing or relating physical phenomena. An analog computer processes data vary continuously.

(b) **Digital computer:-** It is the one which performs arithmetic operations and accesses logical decisions according to instruction coded to it in advance. Examples are calculators and microcomputers.

4

(c) Hydrid computer:- This is simply a combination of analog and digital computer systems into one. Hybrid computers are powerful computing devices.

1.2.3 CLASSIFICATION BY PURPOSE

Computers in terms of purpose are categories into two:-

(a) Special purpose:- This type of computer is designed for only one purpose, that is, to perform a specific operation examples, Speedometer e.t.c.

(b) General purpose:- This type of computer can perform many operations of any kind. Example, super computer

1.3 APPLICATION OF COMPUTER IN BUILDING INDUSTRY

Many building industries in Nigeria now has employed the use of computer to keep inventory of all building materials and equipment. Computer is used to printout or display information about any equipment or material in-stock, with the aid of a kind of an application software called "CAD", Computer Aided Design, the user is assisted in drawing, editing drawing raising bills of quantities, and so on.

The 3D-home architect is a kind of computer aided design with a user friendly graphical user interface (GUI) application with tools to assist the user in drawing or editing the drawings and raising bills of quantity with

the "WYSIWYG" features/characteristics. With this type of software an architect can create a complete floor plan for an entire home.

Once a complete floor plan is designed, one can produce spectacular three-dimensional view, it also produces objective intelligence, which creates walls, cabinet modules, doors, windows and other objects. This kind of application software (3D-Home) is also meant for the surveyors, architects, engineers, estate valuers, planners, interior decorators etc. Each of these professionals can adapt it to suit their immediate and personal use, it can also be used to perform the following functions:-

- Architectural drawings

- Electrical drawings

- Mechanical drawings

- Interior design

- Construction management

1.4 OBJECTIVE OF THE PROJECT

The objective of this study is to automate allocation of houses to all categories of applicant of houses owned by Niger State Housing Corporation. To minimize biasness and the effect of Nigeria factors in houses allocation. Maintain proper records of houses and occupants of all houses owned by Niger State Housing Corporation.

1.5 SIGNIFICANT OF THE STUDY

The benefits of an effective system of allocation of houses in the organisation are as follows:-

a. It is to increase efficiency

b. To improve the working condition of the staff and make them more productive.

c. To improve upon the quality of service to the public.

d. To generate a procedure for an orderly flow of relevant information for use in decision-making

As stated above, the problems encountered using balloting method will be solved using a computer. In this program, the officer in-charge of allocation or a management staff will be made to sit by the computer and be supplied with all the data for house allocation The computer is then operated and all data supplied into it, then it will generate random numbers, which will stand in place of the lucky allottees. This numbers are printed out immediately and issued out to the lucky winners. The randomly generated numbers will be in accordance with the numbers of houses for each category of applicant.

In addition, the computerized system offers many facilities for filing, storing and retrieving of information about any of the houses and the

allottee, within shortest possible time. This system as well offers the following:-

- Reduction in time spent in searching for data

- Reduction in space occupied by files

- Higher speed in processing information

- Better management information system

1.6 SCOPE OF THE STUDY

This project work is restricted to the physical resources of the corporation and the estate department in particular.

The program is house allocation, which is one of the functions of the department. In doing the allocation one needs to know the number of housing estates, number of houses and type of houses in each estate also number of applicants for each type of house, this exercise may be tedious and time consuming without the aid of a computer.

The programmer has chosen house allocation form among the large number of functions the estate department performs, because it is the one that has direct bearing with the public.

The department will supply data on the number of houses available for allocation from each housing estate to the following category of applicants:-

a. Corporation's staff (CSTF)

b. State indigene civil servants (SICS)

c. Non indigene civil servants (NICS)

d. Organisation (ORGS)

e. Individuals (INDD)

1.7 METHODOLOGY

There are several methods of gathering or collecting data. They include among others observation, sampling, questionnaires and interviewing.

The observation and interview methods are employed for this project work because of the desire to get not only a first hand information about how activities are carried out but also to observe how data are handled and processed. Though it may be necessary to apply two or more of these types of method.

The methods used for the collection of information for this study are:

(i)   Interview:- This is by far more common and most satisfactory way of obtaining information, as it gives direct way of discussion with the staff of the estate department.

(ii) Textbooks and Journals:- They provide a visual way of collecting data as they gave a better understanding of the subject.

CHAPTER TWO

NIGER STATE HOUSING CORPORATION

2.0 INTRODUCTION

Housing development in nation building has been one of the paramount concerns of policy makers in the country in recent time. Despite all efforts coupled with articulated, well-planned and excellent housing policies over the years, the housing delivery system paints a picture of dismal future. The unavailability of adequate finance and high cost of building materials have rendered all policies geared toward the development of the sector virtually unworkable.

The need to keep a pace with the recent development in the nation's housing sector has been paramount. There is no doubt that the housing sector is currently facing turbulent times. Construction sites are very few and far apart as corporate and individual resources continue on the down word side.

It is no gain saying that the quality and quantity of housing stock in the state is a barometer of measuring the standard of living, level of technology and civilization. Indeed, next to food, housing ranks next to man's basic needs. Its importance therefore cannot be over-emphasised.

Now many citizens have abandoned the dream of building their houses. The construction industry is fast grinding to a halt. Estate developers and mortgage financiers watch with bewilderment, the unfolding scenario in their industry.

Finance is of course, very crucial to the successful execution of any housing project. The national housing programme is fast becoming a paper tiger is no surprise, against the background of the current economic situation. And the problem of housing the citizens continues without a solution insight. In our cities and urban areas, the landlords are having field day as the salary earners groan under the excruciating rents.

It is equally clear that government can never produce the entire enormous financial wherewithal for the housing industry. Government should create the necessary tempo for the inflow of private capital into the housing industry.

The deteriorating condition in the housing industry calls for pragmatic decision on the part of the Federal Government, the major facilitator of the economy, in other to make the national housing policy work, for it is expected that a massive infection of capital into the national housing programme is urgently required to alleviate the housing problem.

2.1 HISTORY OF NIGER STATE HOUSING CORPORATION

The provision of shelter to all Nigerians and Nigerlites in particular is being given priority attention by the three tiers of government.

It is in the light of the foregoing that the Niger State Government established the Niger State Housing Corporation in 1979 that is three years after the creation of the state under the edict No. 5 of 1979. It is poised to face the challenge of providing residential accommodation in the new state.

2.1.1 STRUCTURE OF THE CORPORATION

Apart from the board of directors, at the apex of administration in the corporation is the general manager who reports directly to the board of directors. The general manager as the chief executive of the corporation sees to the day – today running of the organisation in conjunction with other members of the management team.

The public relations unit and audit unit are directly under the office of the general manager for effective discharge of duties. The corporation is further divided into five department and other sub unit namely:-

a. Administrative department:- Headed by the a director of personal/secretary. This department handle all matters affecting staff and general administration.

b. Works department:- Head by a director. This department is responsible for designing, drawing, bills of quality, supervision of projects etc.

c. Planning and survey department:- The department is headed by deputy director responsible for land matters, planning and surveying.

d. Finance and supply department: Headed by a deputy director. The department handles all financial matters of the corporation.

e. Estate department:- This department is headed by a deputy director and it is vested with responsibilities of management of the corporation's housing estate and other landed properties.

2.2 OBJECTIVE OF SETTING UP THE CORPORATION

The Niger State Housing Corporation has as it cardinal objective the provision of homes for the low, medium and high-income classes in the society. The corporation is charged with the responsibility for the planning, designing, construction and management of houses for acquisition and rental by members of the public and such other functions as the government may direct.

The corporation is also expected to advise the state government on the following housing related matters:-

a. To highlight the advantages of type of houses base on demand

b. To relate urban low and middle level income to appropriate prototype low cost residential accommodation that can easily be funded.

c. To enumerate to the government the various types of houses mostly on demand etc.

2.3 THE ESTATE DEPARTMENT AND ITS FUNCTIONS

The estate department of the Niger State Housing Corporation is one of the functional departments of the organisation. It is headed by a deputy director who is answerable to the general manager. The department is divided into three main units and further divided into subunit each main unit is headed by a principal officer.

The department is vested with the responsibility of management of the corporation's housing estates. It is its duty to acquire and allocate land and houses. It is the department that advices the management on the formulation and implementation of policies relating to the following:-

a. The general state of a property investment market.

b. Management of both developed and undeveloped landed properties of the corporation.

c. Operation of all the various housing estate

d. Land acquisition and compensation

e. Preparation of a feasibility and viability report of projects

f. Fund raising from banks and other financial institutions, closely in conjunction with the chief executive.

The department also provides consultancy services in housing related matters. It also collect rent from tenants in its various estates. All these are possible because the department has in its employment all the professional disciplines and support technical staff.

2.4   HOUSE ALLOCATION "THE TRADITIONAL METHODS"

The explosion population of applicants applying to own a house has been drawing much attention of the state government and the housing corporation in particular. Equally of interest has been the provision of adequate and affordable shelter for subsequent allocation of the few available ones to members of the public.

A study carried out few years ago has shown that the corresponding average demand by various applicant in Niger State is as follows:-

a. Low income groups – 48%

b. Middle income groups – 22.5%

c. Higher income groups - 12.5%

d. Individual groups –17%

16

The high demand by the low and middle income groups makes it difficult to allocate houses in the traditional way of "**FIRST COME FIRST SERVE**", hence the introduction of sale of forms. The management then set up an allocation committee within the management staff. The estate department then submit completed application forms to the committee who then screen the forms one offer the other thereafter they go into "**BALLOTTING**".

The two methods are full of bias as each member of the committee or members of the board of directors may have a candidate hence the allocation may not be free and fair.

2.5 WEAKNESSES OF THE TRADITIONAL METHOD

In the areas where manual operations are still in practice there exist a lot of problems such as:-

a. Lost of vital information

b. Insecurity of information data

c. Lost of application forms, etc.

The traditional method is full of biasness for example the committee members that may be chosen for the house allocation may have vested interest on a particular applicant, in some cases there is government interference that is they may highjack the programme to use it to favour their loyalist especially during the military regime.

Specifically the estate department is faced with major problem peculiar with the traditional method of house allocation, as listed below:-

(i)   Lack of proper storage medium for the housing estate records

(ii)   Lack of proper accounts record storage and security of each housing estate's financial analysis.

(iii) Unreliable records of information and data of the corporation and the estate department's system in particular.

ORGANOGRAM

```
                          ┌─────────────────────────┐
                          │  Deputy Director Estate │
                          └─────────────────────────┘
```

Principal Estate Officer	Principal Catering Officer	Principal Estate Officer

Revenue Clerk	H.E.O Valuation		Canteen	Guest House		S.E.O Documentation	H.E.O Site & Service

S.E.O Lands

Estate Officer

Estate Clerk

Chief Security Officer

Security Men
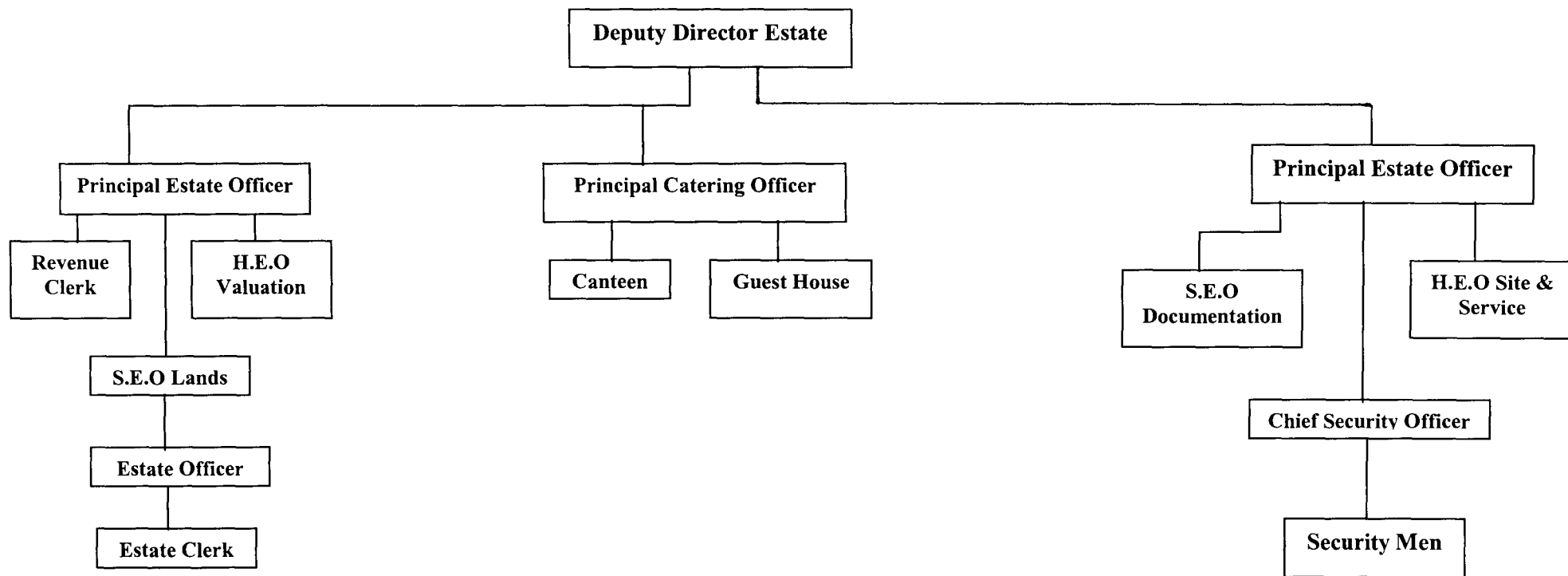
THE ORGANISATION CHART OF THE ESTATE DEPARTMENT OF NIGER

STATE HOUSING CORPORATION

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.0 DESIGN OF THE PROPOSED SYSTEM

In view of the problem enlisted earlier it is of paramount importance to design a system that could eliminate all the weaknesses identified in the course of the project and in addition to earmark a software package suitable for each activity for smooth operation of each unit in the system.

The software is intended to be designed in form of many drives where users could properly select from main menu, submenu, sub-submenu which implies that all facilities of the new system would be presented in a menu structure and others, to ease access to users and programmers of the computer within the department.

The design of any new system can be conveniently divided into four major parts, namely:-

(i)   **INPUT:-** Consideration of input can be influenced greatly by the needs of output. That is, the necessity for quick response from the system would determine the need for an online type of input.

Consideration will also be giving to the following:-

(a) Data collection method and validation.

(b) Type of input media available

(c) Volume of the input documents

(ii) **OUTPUT:-** It is necessary to consider what is required from the system before deciding how to go about producing it.

(iii) **FILES:-** This element is very much linked to input and output. Input is processed against the files to produce the necessary output. The following considerations are also given in designing files.

(a) Storage media

(b) Method of file organisation and access

(c) File security

(iv) **PROCEDURES:-** These are the steps, which unify the whole process, which link everything together to procedure the desired output. It will involve both computer and clerical procedure. They will start with the organisation of the source documents and end with the output document being distributed.

In a system design, the proposed project has to be evaluated. After looking at a broad alternative solution a short list of solution is to be kept. These solution can further be evaluated to find the following:-

(a) **TECHNICAL FEASIBILITY:-** To find out whether the technology needed is available and if available is it used.

(b) **OPERATIONAL FEASIBILITY:-** To ask whether the proposed solution can fit in with existing operation.

(c) **ECONOMIC FEASIBILITY:-** One then ask whether finances are available for implementing the proposed solution.

The system designer had made sure that the procedures and controls are carefully built into the system to ensure the integrity of the data and security of the system. Also flexibility of the design process is to be considered, that is the level to which the system is able to adapt to wide variety of changes.

3.1 REQUIREMENT

The new system is designed to work on standard microcomputer system and so the following items are necessary.

(a) **COMPUTER HARDWARE:-** A micro computer with a micro processor RAM of 16MB and floppy disk drive unit providing for a 3.5" diskette.

(b) **SYSTEM SOFTWARE:-** A window 95 operating system with Microsoft office must be installed.

(c) **PRINTED:-** A neat letter qualify feature and speed of about 1200 lines per minutes and maxim width of 132 characters per line is

recommended, specifically EPSON printer, LaserJet printer are required for production of reports and text.

(d) **UPS (Uninterrupted Power Supply):-** This is a facility which automatically provide power in case of power failure, to the computer and its environs for job continuity.

(e) **AIR CONDITIONER:-** This is met for cooling the environment.

3.2 COST AND BENEFIT ANALYSIS

A cost benefit analysis is necessary to determine economic feasibility of the proposed system. In its socio-economic view, it will bring the organisation to modern technological level of operation of worthy consideration, thus in terms of cost is financial implication while the benefit could be on the expected reach of performance and result of the system's positive achievement, hence the cost and benefit analysed below.

3.2.1 COST ANALYSIS

In order to determine the cost of operation under the existing system it is necessary to recognise the various ways in which cost may be incurred thus are categories as follows:-

(A)   DEVELOPMENT COST1.

1. 1^{NO}. Micro computer system @ ₦80,000.00   = ₦80,000.00

2. 2^{NO} Printer @ ₦ 45,000.00   = ₦ 90,000.00

3. 1^{NO} UPS @ ₦ 18,000.00   = ₦ 18,000.00

4. Installation cost   = ₦ 20,000.00

5. Training of personal   = ₦ 60,000.00

SUB-TOTAL (A)   =₦ 388,000.00

(B) OPERATING COST

1. One Programmer @ 8,000.00 Quarterly   =₦ 32,000.00

2. Installation of 1^{NO} Air conditioner @ 65,000.00   = ₦ 65,000.00

3. Computer papers, and consumables @ 250,000.00   =₦ 250,000.00

4. Utilities (say electricity and so on) @ 20,000.00   = ₦ 20,000.00

5. Miscellaneous expenses   = ₦ 30,000.00

SUB-TOTAL (B)   =₦ 397,000.00

GRAND TOTAL = A + B = 388,000.00+397,000.00

= ₦ 785,000.00

3.2.2 BENEFIT OF THE PROPOSED SYSTEM

The organisation will drive a lot of benefit from the newly design system which include:-

(a) Automated house allocation system

(b) Avoidance of existing system problem

(c) Better services

(d) Faster communication

(e) Easier retrieval of information

(f) Timely decision

(g) Efficiency and improvement of retrieval and storage of information.

3.3 CHANGE OVER PROCEDURE

The conversion of files from the old (existing) system to the new format and content required by the new system and setting up the converted files into the computer were all process which when finished (the change over) where the full replacement of all the existing procedures by the new ones has been carried out.

The change over could be effected to the new system by either of the following ways:-

(i) **Parallel change over:-** This is a type of method where both old and new systems are run concurrently, though it is expensive.

(ii) **Direct change over:-** This type of change over is one which the new system replaces the old system in one move. This method is potentially the least expensive but most risky.

(iii) **Pilot change over:-** In this method the changing over is carried out piece by piece. This method reduces the risks in the direct change over of the whole system.

All the methods mentioned above are good for system change over but for the proposed (New) system, the parallel method is recommended, as it suite the background of the conversion where file conversion and file set up can be performed at the same time with adherence within the change over. The storage, retrieval activities of data information are not affected in any way.

3.4 SYSTEM FLOW CHART

The system flow chart provides a broad overview of the processing operation that are to be accomplished. The password is required before the user can have access to the main menu. The programmer used flow chart since it is very easy to understand due to it diagrammatic nature.

```
                    ┌─────────┐
                   (   Start   )
                    └────┬────┘
                         │
                         ▼
                 ┌───────────────┐
                 │   Pass Word   │
                 └───────┬───────┘
                         │
                         ▼
                 ╱───────────────╲
                ╱    Choice of     ╲
                ╲      Estate      ╱
                 ╲───────┬───────╱
                         │
                         ▼
                 ╱───────────────╲
                ╱     Type of      ╲
                ╲     applicant    ╱
                 ╲───────┬───────╱
                         │
                         ▼
                 ╱───────────────╲
                ╱      Make        ╲
                ╲    allocation    ╱
                 ╲───────┬───────╱
                         │
                         ▼
                  ╱──────────────╲
                 ╱  Is allocation  ╲      NO
                 ╲ completed for the╱ ──────────►
                  ╲    Estate     ╱
                   ╲─────┬──────╱
                         │ YES
                         ▼
           NO    ╱──────────────╲
     ◄────────── ╲ Are Estate completed ╱
                  ╲─────┬──────╱
                         │ YES
                         ▼
                    ┌─────────┐
                   (    End    )
                    └─────────┘
```
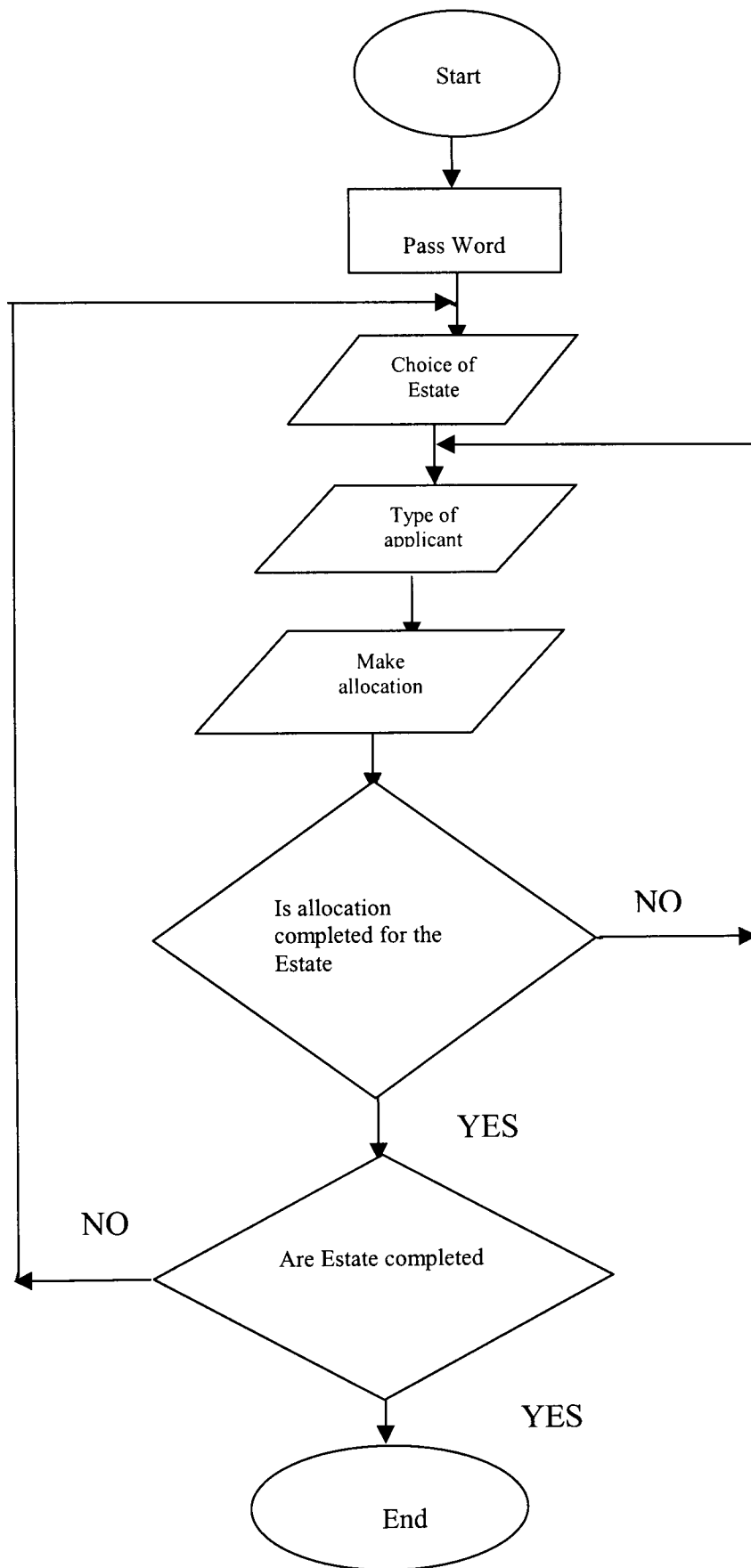
House allocation system processing flow chart.

CHAPTER FOUR

SOFTWARE DESIGN AND IMPLEMENTATION

4.0 PROGRAM DEVELOPMENT

Developing a good compute program is a task that requires careful and adequate planning. A good program is one that is efficient, user friendly, reliable, easily maintained, portable, cost effective, well documented and so on.

(i) **SPECIFICATION:-** The specification should contain details of what the program is expected to do and how to achieve this goal. At this stage, one also determine the required input data as well the output information.

(ii) **DESIGN:-** This stage defines an outline of how to solve the problem. This outline is usually in the form of an algorithm. An algorithm is a step by step method of solving a problems, and it can be implemented in many ways such a flow charts, pseudocodes, N-S diagram and simple English. The flow chart method was used for the purpose of this study.

(iii) **CODING:-** From the algorithm obtained at the design stage one can process to transform the outline into a form

understandable by the computer, this involves coding the algorithm in a suitable computer language.

(iv) **TESTING:-** After completing the coding the program is given a desk check or dry run. This involves inventing simple test data and manually going through the program to ascertain the result before typing into the computer.

However, by the time the proposed system has been tested and ensured that it could work as required and as carefully selected tested data were used in comparison with results obtained from previous run and were found to be the same, it is then concluded that the new system is working accordingly.

IMPLEMENTATION:- Program implementation implies making a program fully operational once it is ascertained that the program has been tested and found working to specification. This simply means that the program is applied to solve the problem outlined in the specification.

The program can be complied into an executable form and then installation diskette will be used to install the new program into the computer.

DOCUMENTATION:- Program documentation is the description of what a program does, how the task is achieved and how to use the program to solve problem say "house allocation" for the purpose of this study.

4.2 PROGRAMMING LANGUAGE

The programming language used for this study is Q-basic which is commonly used with an interpreter as it is more convenient to use because the interpreter executes program only once, not on like **FORTRAN, COBAL OR PASCAL** that uses compiler which execute program in two steps.

The good feature of Basic language is that it is readily available on most microcomputers hence; developing a Basic program can be achieved in little time with little effort and cost. There are different versions of Basic language. In 1976 Leintz made a comparison of early ten versions of the Basic language.

They were also available on a number of different time-sharing computer systems. Although, there are some similarities between them. Early versions of Basic were severely criticized because they do not contain facilities for the development of programs that exhibited good structure.

Consequently, many new additions and extensions to the language were made and different kinds of programs can now be written with the new extension of Basic language. The current enhancement to Basic are proceeding in the direction of improving its "user interface".

4.3 ANALYSIS OF THE PROGRAM

This chapter will analysis how the program runs, numbers generated randomly are viewed on the screen or printed out. It will serve as a manual to a new operator, to read before he can get access to house allocation.

From a careful study of this chapter one can get a firm command of three essentials, objective, allocation and control.

One will know what he want learn the rudiments of how to operate the program and to see how houses are allocated, estate by estate and category by category.

The computerized house allocation system is a menu driven application software. In every menu an option can be selected by entering the corresponding option number.

Starting the house allocation program using windows:-

Step 1. Start QBASIC by clicking "Start" button

Step 2. Point at "program"

Step 3. Click "Microsoft Qbasic"

But when using DOS:-

Step 1. Type 'CD/QB' and press enter key

Step 2. Type C:/QB> QBASIC and press enter key.

To run the program, press Alt + F and then press 'O' to open the program file.

Then press 'Alt + R' and then press enter key.

The house allocation program main menu is preceded by a password test in order to protect the data and guard against unauthorised users. Once valid password is supplied, the program main menu will be displayed. The main menu comprises the following menus:-

4.3.1 ESTATE FILE MAINTENANCE MENU:-

This menu has options as follows

1. Add new estate record

2. Update estate record

3. Delete estate record

4. View estate record

5. Quit

Option 1:- To add new record, type '1' and press enter key. The next is to enter the new estate code and then detail of the estate.

Option 2:- To update estate records, type '2' and press enter key, if the supplied estate code is valid then the user can now modify the existing record.

Option 3:- To delete any estate record type '3' and press enter key, then enter estate code, if such code is found, details of the estate will be displayed. Type 'Y' and press enter key to delete the current record, or 'N' not to delete.

Option 4:- To view estate record type '4' and press enter key. Estate records will be displayed on the screen one after the other enter 'Y' to continue or 'N' to stop.

4.3.2 HOUSE ALLOCATION PROCESSING MENU

This menu has two options, one for specification of percentage allocation to each of the five (5) categories of beneficiaries and another option for processing computation of all the allocation.

To specify percentage allocation type '1' and press enter key then enter percentage allocation, type '2' and press enter key. Without further human intervention, the system retrieves data from house database file and category database file and use them to accomplish the

processing/computation task, after success completion of this process, press any key to return to menu.

4.3.3 PRINT REPORT MENU

There are basically two type of report, they are: - Estate listing report and house allocation report. To print estate-listing report, type '1' and press enter key. To print house allocation report, type '2' and press enter key.

4.3.4 SIGNING OFF

Select the Quit option by entering the corresponding number and press enter key.

4.4 PROGRAM FILES

4.4.1 HOUSE DATABASE FILE: -

1. This database file contains records of all the estates and houses therein. Information such as estate name, type of house and number of houses are stored in this database file.

4.4.2 CATEGORY DATABASE FILE: -

2. Information about various category is of beneficiaries and percentage allocation for each category are stored in the category. Database file.

4.4.3 ESTATE REPORT FILE: -

3. This report file contains formatted copy of all the existing estate and their details ready for printing through the "estate listing report" option in the report menu.

4.4.4 ALLOCATION REPORT FILE:-

4. When all computation of allocations based on the data retrieved from the category database are completed; the results are stored in the allocation report file for printing through the "house allocation report" option in the report menu.

CHAPTER FIVE

5.0 THE NEED FOR A COMPUTER LITERATE SOCIETY

The computer system as already discussed in this project work, has the facilities of transferring and processing information at a very high and accurate speed, and that is why computer is needed in may aspects of our day to day activities.

Some aspects of the use of computers are as follows:-

(i) **BUILDING INDUSTRY:-** Computers are now used to keep inventory of building material and equipments it is used to make all kinds of engineering drawings with the aid of 3D-Home architect.

(ii) **FINANCE SECTOR:-** This sector comprises banking, insurance, securities and stock management. The automatic teller machines (ATMs) are the most visible of computerized banking system in Nigeria.

(iii) **OFFICE AUTOMATION:-** This refers to those computer based applications with office work, such as Fax-machine which is now common in offices and business centers, voice processing, that is

when you send a massage, your voice is made in form of digits and stored in a magnetic disk and can be retrieved later, and so on.

(iv) **HEALTH SECTOR:-** The computer has become a constant companion of both patients and medical personnel in most parts of the world.

The patient accounting system, updates patients records to reflect laboratory test and administered drugs.

5.1 LIMITATION

Using the method of generation of members randomly as being analysed in this project work, allocation of houses to various category of applicants becomes easier. However the programmer observed the following:-

i. If the number of applications is less than or equal number of percentage allocated for a particular category then it is automatic for those category of applicants.

ii. After the numbers has been generated randomly, the result can be moved directly to the print report menu. Without viewing it on the screen to avoid biasness and selfishness. (The operator may want to repeat the exercise if the number he has interest on did not appear).

iii.   The randomly generated numbers are not to be saved as on

file name is given to it, to avoid any alteration.

iv.   Mouse/Joystick cannot be used to run this program.

5.2   RECOMMENDATION.

It has become clear that in any organisation manual operation and control of its activities cannot meet up with the requirement of efficient and timeline execution of its project, mainly offices and houses. It has therefore become imperative for Niger State Housing Corporation to unequivocally accept the concept of computerization in house allocation and rendering other services to customers. The installation of the proposed system is to ensure maximum benefit as such it is recommended that the following be adopted:-

i.   **MANPOWER:-** There is need to review the manpower need of the department, the typist who are not computer literate should be trained to used word processor and some staff need be employed like an in-house programmer.

ii.   **SECURITY:-** Security of any computer room should be orderly stated to avoid both logical and physical problems hence should be applied to both corporation's staff and outsiders.

iii. **COMPUTER ENVIRONMENT:-** The system should be treated for efficient durable function therefore the normal air conditioner needed to keep the room cool at all times should be properly maintained.

iv. **RESEACH:-** This can be conducted further by including other departments like engineering, planning and so on.

5.3 CONCLUSION

Information is an important aspect in the resource allocation system of any organisation because it determines the efficiency of its services.

The estate department of Niger State Housing Corporation makes use of files for recording information of various houses and the occupants, and when there is need for an information about any house the files are traced manually one after the other.

The computerized system has provided many facilities such as reduction in space occupied by files reduction in time spent searching for data, hence searching is faster and accurate.

The purpose of this project work is to provide a lasting solution to the problem being encountered in house allocation by the Niger State Housing Corporation. The programmer was able to design the program is such away that house allocation can be conveniently carried out as

designed, with each applicant having equal opportunity of being selected

and the program can be use in any housing estate in terms of house

allocation.

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```
                NIGER STATE HOUSING CORPORATION
                       MINNA NIGER STATE
             COMPUTERISED HOUSE ALLOCATION SYSTEM

                   ESTATE FILE MAINTENANCE MENU
```

        1.   Add New Estate Record
        2.   Update Estate Record
        3.   Delete Estate Record
        4.   View Estate Records
        5.   Quit.

          Enter your choice...?

Written By: AHMAD MUHAMMAD YABAGI (PGD/MCS/2000/980)

NIGER STATE HOUSING CORPORATION
MINNA NIGER STATE
COMPUTERISED HOUSE ALLOCATION SYSTEM

ALLOCATION PROCESSING MENU

1.   Specify Percentage Allocation
2.   Process Allocations
3.   Quit.

Enter your choice...?

Written By: AHMAD MUHAMMAD YABAGI (PGD/MCS/2000/980)

NIGER STATE HOUSING CORPORATION
MINNA NIGER STATE
COMPUTERISED HOUSE ALLOCATION SYSTEM

REPORT MENU

1. Estates Listing Report
2. Print House Allocation Report
3. Quit.

Enter your choice...?

Written By: AHMAD MUHAMMAD YABAGI (PGD/MCS/2000/980)

```
ESTATE CODE      :      DK001
ESTATE NAME      :      DUTSEN KURA ESTATE
LOCATION         :      DUTSENKURA
HOUSE TYPE       :      3-BEDROOM
NO OF HOUSES     :       25
REMARK           :
```

CONTINUE ? (Y/N)?

H-TYPE	NUMBER	CORP.STAFF	IND.(C/S)	NON-IND	ORG.(C/S)	INDIVIDUALS
3-BEDROOM	25	2	10	2	6	4
2-BEDROOM	60	6	24	6	15	9
3-BEDROOM	10	1	4	1	2	2
4-BEDROOM	25	2	10	2	6	4
3-BEDROOM	8	1	3	1	2	1
4-BEDROOM	19	2	8	2	5	3
2-BEDROOM	55	6	22	6	14	8
3-BEDROOM	12	1	5	1	3	2
3-BEDROOM	260	26	104	26	65	39
2-BEDROOM	10	1	4	1	2	2
3-BEDROOM	50	5	20	5	12	8
2-BEDROOM	44	4	18	4	11	7
2-BEDROOM	25	2	10	2	6	4

NO. OF HOUSES   603

REPORT....

H-TYPE	NUMBER	CORP.STAFF	IND.(C/S)	NON-IND	ORG.(C/S)	INDIVIDUALS
3-BEDROOM	25	2	10	2	6	4

ESTATE NAME	HOUSE TYPE	LOCATION	NO. OF HOUSES
DUTSEN KURA ESTATE	3-BEDROOM	DUTSENKURA	25
ODUOYE HOUSING ESTATE	2-BEDROOM	123 QTRS	60
NIGER HOUSE ESTATE	3-BEDROOM	TUNGA	10
NIGER HOUSE ESTATE	4-BEDROOM	TUNGA	25
ZARUMAI HOUSING ESTATE	3-BEDROOM	ZARUMAI	8
ZARUMAI HOUSING ESTATE	4-BEDROOM	ZARUMAI	19
BOSSO LOWCOST	2-BEDROOM	BOSSO	55
PROGRESS COURT '84	3-BEDROOM	ZARUMAI	12
KRAMER ITALO ESTATE	3-BEDROOM	TUNGA	260
INTERM. HOUSING ESTATE	2-BEDROOM	TUNGA	10
INTERM. HOUSING ESTATE	3-BEDROOM	TUNGA	50
CO-OPERATIVE HOUSG.SCHEME	2-BEDROOM		44
TRADITIONAL HOUSG.SCHEME	2-BEDROOM		25

REPORT....

```basic
'*****************************************************
REM Program Computerised House Allocation System
REM For Niger State Housing Corporation, Minna
REM Written By: Ahmad Muhammad Yabagi
REM Reg.No: PGD/MCS/2000/2001/980
REM In partial fulfillment for the award of
REM Postgraduate Diploma in Maths/Computer Science
'*****************************************************
LET N = 50
DIM ESTCODE$(N), ESTNAME$(N), HSTYPE$(N), NOHOUSES%(N)
DIM LOCATION$(N), REMARK$(N)
DIM ASICS(N), ANICS(N), AOGRS(N), AINDD(N), ACSTF(N)

TITLE1$ = "          NIGER STATE HOUSING CORPORATION"
TITLE2$ = "       COMPUTERISED HOUSE ALLOCATION SYSTEM"
TITLE4$ = "                MINNA NIGER STATE"
GOTO pwd
'----------------------------------------------
ESTREPORT:
REM ESTATES REPORT MODULE

        TITLE3$ = "     ESTATES LISTING REPORT"
        OPEN "HOUSE.DAT" FOR INPUT AS #1
CLS
  LOCATE 1, 10: PRINT TITLE1$
  LOCATE 2, 20: PRINT TITLE3$
  LOCATE 2, 60: PRINT "DATE :"; DATE$
  FOR X = 1 TO 79: LOCATE 3, X: PRINT CHR$(196): NEXT
  LOCATE 4, 1: PRINT "ESTCODE"
  LOCATE 4, 10: PRINT "ESTATE NAME"
  LOCATE 4, 40: PRINT "HOUSE TYPE"
  LOCATE 4, 55: PRINT "LOCATION"
  LOCATE 4, 65: PRINT "NO. OF HOUSES"
  FOR X = 1 TO 79: LOCATE 5, X: PRINT CHR$(196): NEXT
  COL% = 1: ROW% = 6
'DO
        FOR J = 1 TO R
        INPUT #1, ESTCODE$, ESTNAME$, HSTYPE$, LOCATION$, NOHOUSES%,
REMARK$
        LOCATE ROW%, 1: PRINT ESTCODE$
        LOCATE ROW%, 10: PRINT ESTNAME$
        LOCATE ROW%, 40: PRINT HSTYPE$
        LOCATE ROW%, 55: PRINT LOCATION$
        LOCATE ROW%, 70: PRINT NOHOUSES%
        ROW% = ROW% + 1
        NEXT J

'LOOP UNTIL (EOF(1))
5
FOR X = 1 TO 79: LOCATE ROW%, X: PRINT CHR$(196): NEXT
LOCATE 23, 1: PRINT "END OF REPORT...."
SLEEP
CLOSE
GOTO REPORTMENU
'----------------------------------------------


ALLOCREPORT:
REM PRINT HOUSE ALLOCATION REPORT MODULE
            GTOTAL% = 0
        TITLE3$ = "     HOUSE ALLOCATION REPORT"
```

```
            OPEN "ALLOCREP.DAT" FOR INPUT AS #1
CLS
  LOCATE 1, 10: PRINT TITLE1$
  LOCATE 2, 20: PRINT TITLE3$
  LOCATE 2, 60: PRINT "DATE :"; DATE$
  FOR X = 1 TO 79: LOCATE 3, X: PRINT CHR$(196): NEXT
  LOCATE 4, 1: PRINT "ESTCODE"
  LOCATE 4, 9: PRINT "H-TYPE"
  LOCATE 4, 20: PRINT "NUMBER"
  LOCATE 4, 27: PRINT "CORP.STAFF"
  LOCATE 4, 38: PRINT "IND.(C/S)"
  LOCATE 4, 48: PRINT "NON-IND"
  LOCATE 4, 58: PRINT "ORG.(C/S)"
  LOCATE 4, 68: PRINT "INDIVIDUALS"
  FOR X = 1 TO 79: LOCATE 5, X: PRINT CHR$(196): NEXT
  COL% = 1: ROW% = 6
DO
        FOR J = 1 TO R
        INPUT #1, ESTCODE$, HSTYPE$, NOHOUSES%, ACSTF, ASICS, ANICS,
AOGRS, AINDD
        LOCATE ROW%, 1: PRINT ESTCODE$
        LOCATE ROW%, 9: PRINT HSTYPE$
        LOCATE ROW%, 22: PRINT NOHOUSES%
        LOCATE ROW%, 30: PRINT ACSTF
        LOCATE ROW%, 40: PRINT ASICS
        LOCATE ROW%, 50: PRINT ANICS
        LOCATE ROW%, 60: PRINT AOGRS
        LOCATE ROW%, 73: PRINT AINDD
        ROW% = ROW% + 1: GTOTAL% = GTOTAL% + NOHOUSES%
        NEXT

LOOP UNTIL (EOF(1))
115
FOR X = 1 TO 79: LOCATE ROW%, X: PRINT CHR$(196): NEXT
LOCATE 20, 1: PRINT "TOTAL NO. OF HOUSES "; GTOTAL%
LOCATE 23, 1: PRINT "END OF REPORT...."
SLEEP
CLOSE
'------------------------------------------------

GOTO REPORTMENU
'------------------------------------------------
DISPLAYREC:
REM DISPLAY  ESTATE RECORDS MODULE
        OPEN "HOUSE.DAT" FOR INPUT AS #2
'DO
        FOR J = 1 TO R
  CLS
'   LOCATE 1, 20: PRINT TITLE1$
  LOCATE 1, 15: PRINT TITLE2$
  LOCATE 2, 25: PRINT "DISPLAYING ESTATE RECORDS"; ""
  FOR X = 10 TO 70: LOCATE 3, X: PRINT CHR$(196): NEXT
  FOR X = 10 TO 70: LOCATE 22, X: PRINT CHR$(196): NEXT
  LOCATE 5, 20: PRINT "ESTATE CODE     :"
  LOCATE 6, 20: PRINT "ESTATE NAME     :"
  LOCATE 7, 20: PRINT "LOCATION        :"
  LOCATE 8, 20: PRINT "HOUSE TYPE      :"
  LOCATE 9, 20: PRINT "NO OF HOUSES    :"
  LOCATE 10, 20: PRINT "REMARK          :"
INPUT #2, ESTCODE$, ESTNAME$, HSTYPE$, LOCATION$, NOHOUSES%, REMARK$
        LOCATE 5, 44: PRINT ESTCODE$
```

```
                LOCATE 6, 44: PRINT ESTNAME$
                LOCATE 7, 44: PRINT LOCATION$
                LOCATE 8, 44: PRINT HSTYPE$
                LOCATE 9, 44: PRINT NOHOUSES%
                LOCATE 10, 44: PRINT REMARK$
                LOCATE 23, 20: INPUT "CONTINUE ? (Y/N)"; YN$
                IF UCASE$(YN$) = "N" THEN GOTO 4
         NEXT J
        'LOOP UNTIL (EOF(2))
        4
        LOCATE 23, 20: PRINT "END OF DISPLAY.  PRESS ANY KEY..."
        SLEEP
        CLOSE
        GOTO MAINTMENU
        '-----------------------------------------------
        DELETEREC:
        REM DELETE ESTATE RECORDS MODULE
                OPEN "HOUSE.DAT" FOR INPUT AS #2

                FOR K = 1 TO R
                'WHILE NOT EOF(2)
                'K = K + 1
                INPUT #2, ESTCODE$(K), ESTNAME$(K), HSTYPE$(K), LOCATION$(K),
        NOHOUSES%(K), REMARK$(K)
                'WEND
                NEXT K
                CLOSE #2
                I = 1
        DO
                CLS
        '  LOCATE 1, 20: PRINT TITLE1$
          LOCATE 1, 15: PRINT TITLE2$
          LOCATE 2, 26: PRINT "DELETING ESTATE RECORDS"; ""
          FOR X = 10 TO 70: LOCATE 3, X: PRINT CHR$(196): NEXT
          FOR X = 10 TO 70: LOCATE 22, X: PRINT CHR$(196): NEXT
          LOCATE 5, 20: PRINT "ESTATE CODE     :"
          LOCATE 6, 20: PRINT "ESTATE NAME     :"
          LOCATE 7, 20: PRINT "LOCATION        :"
          LOCATE 8, 20: PRINT "HOUSE TYPE      :"
          LOCATE 9, 20: PRINT "NO OF HOUSES    :"
          LOCATE 10, 20: PRINT "REMARK          :"
                LOCATE 5, 44: PRINT ESTCODE$(I)
                LOCATE 6, 44: PRINT ESTNAME$(I)
                LOCATE 7, 44: PRINT LOCATION$(I)
                LOCATE 8, 44: PRINT HSTYPE$(I)
                LOCATE 9, 44: PRINT NOHOUSES%(I)
                LOCATE 10, 44: PRINT REMARK$(I)
                LOCATE 23, 20: INPUT "DELETE ABOVE RECORD ? (Y/N)"; YN$
                IF UCASE$(YN$) = "Y" THEN GOTO 15
                IF I = K THEN 1010
                I = I + 1
        LOOP

        IF EOF(2) THEN 1010
        15
        I = DELETED
        LOCATE 23, 20: PRINT "PLS. WAIT...                DELETING RECORD!"
        OPEN "HOUSE.DAT" FOR OUTPUT AS #1
                FOR J = 1 TO K
                    IF J <> DELETED THEN
```

```
                WRITE #1, ESTCODE$(J), ESTNAME$(J), HSTYPE$(J),
LOCATION$(J), NOHOUSES%(J), REMARK$(J)
            END IF
        NEXT
        CLOSE #1
1010
LOCATE 23, 20: PRINT "END OF FILE!    PRESS ANY KEY..."
SLEEP
CLOSE
GOTO MAINTMENU
'----------------------------------------------


ADDREC:
REM ADD ESTATE RECORD MODULE
        TITLE3$ = "          ADDING NEW ESTATE RECORD"
        OPEN "HOUSE.DAT" FOR APPEND AS #1
CLS
LOCATE 1, 20: PRINT TITLE1$
LOCATE 2, 20: PRINT TITLE2$
LOCATE 3, 20: PRINT TITLE3$
FOR X = 10 TO 70: LOCATE 4, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 22, X: PRINT CHR$(196): NEXT
LOCATE 5, 20: PRINT "ESTATE CODE    :"
LOCATE 6, 20: PRINT "ESTATE NAME    :"
LOCATE 7, 20: PRINT "LOCATION       :"
LOCATE 8, 20: PRINT "HOUSE TYPE     :"
LOCATE 9, 20: PRINT "NO OF HOUSES   :"
LOCATE 10, 20: PRINT "REMARK          :"
        LOCATE 5, 44: INPUT mCODE$
FOR J = 1 TO N - 1
IF ESTCODE$(J) = mCODE$ THEN
    COLOR 19
    LOCATE 23, 20: PRINT "ESTATE CODE ALREADY EXISTS. PRESS ANY KEY..."
    SLEEP: COLOR 7: GOTO 7
END IF
NEXT
        LOCATE 6, 44: INPUT ESTNAME$
        LOCATE 7, 44: INPUT LOCATION$
        LOCATE 8, 44: INPUT HSTYPE$
        LOCATE 9, 44: INPUT NOHOUSES%
        LOCATE 10, 44: INPUT REMARK$
ESTCODE$ = mCODE$
LOCATE 23, 20: INPUT "WRITE RECORD ON FILE? (Y/N)"; YN$
IF UCASE$(YN$) = "Y" THEN
WRITE #1, ESTCODE$, ESTNAME$, HSTYPE$, LOCATION$, NOHOUSES, REMARK$
END IF
7
CLOSE
LOCATE 23, 20: INPUT "DO YOU WANT TO ADD ANOTHER ? (Y/N)"; YN$
IF UCASE$(YN$) = "Y" THEN GOTO ADDREC
IF UCASE$(YN$) = "N" THEN GOTO MAINTMENU
'----------------------------------------------
pwd:
OPEN "data.pas" FOR INPUT AS #1
INPUT #1, pw$: CLOSE #1
100
CLS : LOCATE 12, 20: PRINT "Enter password"
COLOR 4, 4
LOCATE 12, 35: INPUT p$:   COLOR 19, 0
IF UCASE$(p$) <> pw$ THEN
```

```
                LOCATE 14, 20: PRINT "Invalid Password, press any key..."
                SLEEP: LOCATE 14, 20: PRINT SPC(40);
                COLOR 7, 0: GOTO 100
END IF
GOTO mmn
'------------------------------------
REM UPDATE HOUSE RECORD MODULE
UPDATEREC:

                TITLE3$ = "          UPDATING ESTATE RECORD"
                'OPEN "HOUSE.DAT" FOR APPEND AS #2
FLAG% = 0
CLS
LOCATE 1, 20: PRINT TITLE1$
LOCATE 2, 20: PRINT TITLE2$
LOCATE 3, 27: PRINT TITLE3$
FOR X = 10 TO 70: LOCATE 4, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 22, X: PRINT CHR$(196): NEXT
LOCATE 5, 20: PRINT "ESTATE CODE      :"
LOCATE 6, 20: PRINT "ESTATE NAME      :"
LOCATE 7, 20: PRINT "LOCATION         :"
LOCATE 8, 20: PRINT "HOUSE TYPE       :"
LOCATE 9, 20: PRINT "NO OF HOUSES     :"
LOCATE 10, 20: PRINT "REMARK            :"
LOCATE 5, 44: INPUT mCODE$
FOR J = 1 TO N - 1
IF ESTCODE$(J) = mCODE$ THEN
            LOCATE 5, 46: PRINT ESTCODE$(J)
            LOCATE 6, 46: PRINT ESTNAME$(J)
            LOCATE 7, 46: PRINT HSTYPE$(J)
            LOCATE 8, 46: PRINT LOCATION$(J)
            LOCATE 9, 46: PRINT NOHOUSES%(J)
            LOCATE 10, 46: PRINT REMARK$(J)

            ''''''''''''''''''''''''''''''''''''''
            mCODE$(J) = ESTCODE$(J)
            mESTNAME$(J) = ESTNAME$(J)
            mHSTYPE$(J) = HSTYPE$(J)
            mLOCATION$(J) = LOCATION$(J)
            mNOHOUSES(J) = NOHOUSES%(J)
            mREMARK$(J) = REMARK$(J)
            LOCATE 6, 44: INPUT mESTNAME$(J)
            IF mESTNAME$(J) <> "" THEN ESTNAME$(J) = mESTNAME$(J)
            LOCATE 7, 44: INPUT mHSTYPE$(J)
            IF mHSTYPE$(J) <> "" THEN HSTYPE$(J) = mHSTYPE$(J)
            LOCATE 8, 44: INPUT mLOCATION$(J)
            IF mLOCATION$(J) <> "" THEN LOCATION$(J) = mLOCATION$(J)
            LOCATE 9, 44: INPUT mNOHOUSES(J)
            IF mNOHOUSES%(J) <> 0 THEN NOHOUSES%(J) = mNOHOUSES%(J)
            LOCATE 10, 44: INPUT mREMARK$(J)
            IF mREMARK$(J) <> "" THEN REMARK$(J) = mREMARK$(J)
        FLAG
   END IF
NEXT J
IF FLAG% = 0 THEN
    COLOR 19
    LOCATE 23, 20: PRINT "ESTATE CODE NOT FOUND !  PRESS ANY KEY..."
    SLEEP: COLOR 7: GOTO 9
END IF

LOCATE 23, 20: INPUT "UPDATE STAFF RECORD ? (Y/N)"; YN$
```

```
IF UCASE$(YN$) = "N" THEN GOTO 9
IF UCASE$(YN$) = "Y" THEN
                  OPEN "HOUSE.DAT" FOR OUTPUT AS #1
         FOR J = 1 TO N - 1
WRITE #1, ESTCODE$(J), ESTNAME$(J), HSTYPE$(J), LOCATION$(J),
NOHOUSES%(J), REMARK$(J)
         NEXT J
END IF
9
CLOSE
LOCATE 23, 20: INPUT "DO YOU WANT TO UPDATE ANOTHER ? (Y/N)"; YN$
IF UCASE$(YN$) = "Y" THEN GOTO UPDATEREC
IF UCASE$(YN$) = "N" THEN GOTO MAINTMENU
GOTO MAINTMENU

'----------------------------------------
REM SPECIFY PERCENTAGE ALLOCATION PROGRAM MODULE
SPECIFY:
         TITLE3$ = "    SPECIFYING PERCENTAGE ALLOCATION"
         OPEN "CATEGORY.DAT" FOR OUTPUT AS #1
CLS
LOCATE 1, 20: PRINT TITLE1$
LOCATE 2, 20: PRINT TITLE2$
LOCATE 3, 25: PRINT TITLE3$
FOR X = 10 TO 70: LOCATE 4, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 22, X: PRINT CHR$(196): NEXT
LOCATE 5, 20: PRINT "Enter percentage allocation to the following:-"
LOCATE 6, 20: PRINT "e.g. Enter  5   for   5%"
LOCATE 9, 20: INPUT "HOUSING CORPORATION STAFF               :"; CSTF
LOCATE 10, 20: INPUT "NIGER STATE INDIGENS (CIVIL SERVANTS) :"; SICS
LOCATE 11, 20: INPUT "NON INDIGENS (CIVIL SERVANTS)         :"; NICS
LOCATE 12, 20: INPUT "ORGANISATIONS/PARASTATALS             :"; OGRS
LOCATE 13, 20: INPUT "INDIVIDUALS                          :"; INDD
TOT% = CSTF + SICS + NICS + OGRS + INDD
LOCATE 14, 57: PRINT STR$(TOT%) + "%"
LOCATE 23, 20: INPUT "WRITE RECORD ON FILE? (Y/N)"; YN$
IF UCASE$(YN$) = "Y" THEN
WRITE #1, CSTF, SICS, NICS, OGRS, INDD
END IF
CLOSE #1
GOTO COMPMENU

'----------------------------------------
REM COMPUTATION/PROCESSING OF HOUSE ALLOCATION PROGRAM MODULE
COMPUTE:
CLS
LOCATE 10, 20: PRINT "PLS. WAIT...  PROCESSING HOUSE ALLOCATION"
         OPEN "CATEGORY.DAT" FOR INPUT AS #1
         OPEN "ALLOCREP.DAT" FOR OUTPUT AS #2
         OPEN "HOUSE.DAT" FOR INPUT AS #3
         K = 0
         WHILE NOT EOF(3)
         FOR K = 1 TO R
         K = K + 1
         INPUT #3, ESTCODE$(K), ESTNAME$(K), HSTYPE$(K), LOCATION$(K),
NOHOUSES%(K), REMARK$(K)
         WEND
         NEXT K
         CLOSE #3
         I = 1
```

```
        ' GET DATA
        INPUT #1, CSTF, SICS, NICS, OGRS, INDD

        FOR J = 1 TO K
                ACSTF(J) = CSTF / 100 * NOHOUSES(J)
                ASICS(J) = SICS / 100 * NOHOUSES(J)
                ANICS(J) = NICS / 100 * NOHOUSES(J)
                AOGRS(J) = OGRS / 100 * NOHOUSES(J)
                AINDD(J) = INDD / 100 * NOHOUSES(J)
        NEXT
        FOR K = 1 TO J
        WRITE #2, ESTCODE$(K), HSTYPE$(K), NOHOUSES%(K),
CINT(ACSTF(K)), CINT(ASICS(K)), CINT(ANICS(K)), CINT(AOGRS(K)),
CINT(AINDD(K))
        NEXT K
        LOCATE 10, 10: PRINT "PROCESSING OF HOUSE ALLOCATION IS
SUCCESSFUL, PRESS ANY KEY."
        SLEEP: CLOSE : GOTO COMPMENU

'----------------------------------------
REM HOUSE ALLOCATION SYSTEM REPORT MENU
REPORTMENU:
CLS
LOCATE 4, 15: PRINT TITLE1$
LOCATE 5, 15: PRINT TITLE4$
LOCATE 6, 15: PRINT TITLE2$
LOCATE 8, 30: PRINT "     REPORT MENU"
COLOR 2
LOCATE 11, 24: PRINT "1"
COLOR 7
LOCATE 11, 25: PRINT ".  Estates Listing Report"
COLOR 2
LOCATE 12, 24: PRINT "2"
COLOR 7
LOCATE 12, 25: PRINT ".  Print House Allocation Report"
COLOR 2
LOCATE 13, 24: PRINT "3"
COLOR 7
LOCATE 13, 25: PRINT ".  Quit."
LOCATE 4, 10: FOR X = 10 TO 70: LOCATE 9, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 3, X: PRINT CHR$(220): NEXT
FOR X = 10 TO 70: LOCATE 17, X: PRINT CHR$(220): NEXT
COLOR 11
LOCATE 23, 17: PRINT "Written By: AHMAD MUHAMMAD YABAGI
(PGD/MCS/2000/980)"
COLOR 14
LOCATE 18, 25: INPUT "Enter your choice..."; C%
COLOR 7
IF C% < 1 OR C% > 3 THEN
        LOCATE 21, 20: PRINT "Invalid Number ! Press any key..."
        SLEEP: GOTO REPORTMENU
END IF
IF C% = 3 THEN
        GOTO mmn
END IF
'IF C% = 4 THEN GOTO REPORT
'GOTO OPENORSECRETE
IF C% = 1 THEN GOTO ESTREPORT
IF C% = 2 THEN GOTO ALLOCREPORT
'---------------------------------------------
```

```
'-----------------------------------------
REM PROCESSING OF ALLOCATION MENU
COMPMENU:
CLS
LOCATE 4, 15: PRINT TITLE1$
LOCATE 5, 15: PRINT TITLE4$
LOCATE 6, 15: PRINT TITLE2$
LOCATE 8, 24: PRINT "   ALLOCATION PROCESSING MENU"
COLOR 2
LOCATE 11, 24: PRINT "1"
COLOR 7
LOCATE 11, 25: PRINT ".  Specify Percentage Allocation"
COLOR 2
LOCATE 12, 24: PRINT "2"
COLOR 7
LOCATE 12, 25: PRINT ".  Process Allocations"
COLOR 2
LOCATE 13, 24: PRINT "3"
COLOR 7
LOCATE 13, 25: PRINT ".  Quit."
LOCATE 4, 10: FOR X = 10 TO 70: LOCATE 9, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 3, X: PRINT CHR$(220): NEXT
FOR X = 10 TO 70: LOCATE 17, X: PRINT CHR$(220): NEXT
COLOR 11
LOCATE 23, 17: PRINT "Written By: AHMAD MUHAMMAD YABAGI
(PGD/MCS/2000/980)"
COLOR 14
LOCATE 18, 25: INPUT "Enter your choice..."; C%
COLOR 7
IF C% < 1 OR C% > 3 THEN
        LOCATE 21, 20: PRINT "Invalid Number ! Press any key..."
        SLEEP: GOTO COMPMENU
END IF
IF C% = 3 THEN
        GOTO mmn
END IF
'IF C% = 4 THEN GOTO REPORT
'GOTO OPENORSECRETE
IF C% = 1 THEN GOTO SPECIFY
IF C% = 2 THEN GOTO COMPUTE
'-------------------------------------------------

REM ESTATE FILE MAINTENANCE MENU
MAINTMENU:
CLS
LOCATE 4, 15: PRINT TITLE1$
LOCATE 5, 15: PRINT TITLE4$
LOCATE 6, 15: PRINT TITLE2$
LOCATE 8, 25: PRINT "  ESTATE FILE MAINTENANCE MENU"
COLOR 2
LOCATE 11, 24: PRINT "1"
COLOR 7
LOCATE 11, 25: PRINT ".  Add New Estate Record"
COLOR 2
LOCATE 12, 24: PRINT "2"
COLOR 7
LOCATE 12, 25: PRINT ".  Update Estate Record"
COLOR 2
LOCATE 13, 24: PRINT "3"
COLOR 7
LOCATE 13, 25: PRINT ".  Delete Estate Record"
```

```
COLOR 2
LOCATE 14, 24: PRINT "4"
COLOR 7
LOCATE 14, 25: PRINT ".  View Estate Records"
COLOR 2
LOCATE 15, 24: PRINT "5"
COLOR 7
LOCATE 15, 25: PRINT ".  Quit."
LOCATE 4, 10: FOR X = 10 TO 70: LOCATE 9, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 3, X: PRINT CHR$(220): NEXT
FOR X = 10 TO 70: LOCATE 19, X: PRINT CHR$(220): NEXT
COLOR 11
LOCATE 23, 17: PRINT "Written By: AHMAD MUHAMMAD YABAGI
(PGD/MCS/2000/980)"
COLOR 14
LOCATE 18, 25: INPUT "Enter your choice..."; C%
COLOR 7
IF C% < 1 OR C% > 5 THEN
        LOCATE 21, 20: PRINT "Invalid Number ! Press any key..."
        SLEEP: GOTO MAINTMENU
END IF
IF C% = 5 THEN
        GOTO mmn
END IF
'IF C% = 4 THEN GOTO REPORT
'GOTO OPENORSECRETE
IF C% = 1 THEN GOTO ADDREC
IF C% = 2 THEN GOTO UPDATEREC
IF C% = 3 THEN GOTO DELETEREC
IF C% = 4 THEN GOTO DISPLAYREC


'--------------------------------------

REM HOUSE ALLOCATION SYSTEM MAIN MENU
mmn:
COLOR 7, 6, 4
CLS
LOCATE 4, 15: PRINT TITLE1$
LOCATE 5, 15: PRINT TITLE4$
LOCATE 6, 15: PRINT TITLE2$
LOCATE 8, 20: PRINT "            PROGRAM MAIN-MENU"
COLOR 2
LOCATE 11, 24: PRINT "1"
COLOR 7
LOCATE 11, 25: PRINT ".  ESTATE FILE MAINTENANCE"
COLOR 2
LOCATE 12, 24: PRINT "2"
COLOR 7
LOCATE 12, 25: PRINT ".  PROCESSING OF ALLOCATION"
COLOR 2
LOCATE 13, 24: PRINT "3"
COLOR 7
LOCATE 13, 25: PRINT ".  PRINT REPORT"
COLOR 2
LOCATE 14, 24: PRINT "4"
COLOR 7
LOCATE 14, 25: PRINT ".  QUIT"
LOCATE 4, 10: FOR X = 10 TO 70: LOCATE 9, X: PRINT CHR$(196): NEXT
FOR X = 10 TO 70: LOCATE 3, X: PRINT CHR$(220): NEXT: R = 13
FOR X = 10 TO 70: LOCATE 17, X: PRINT CHR$(220): NEXT
COLOR 11
```

```
LOCATE 23, 17: PRINT "Written By: AHMAD MUHAMMAD YABAGI
(PGD/MCS/2000/980)"
COLOR 14
LOCATE 18, 25: INPUT "Enter your choice..."; C%
COLOR 7
IF C% < 1 OR C% > 4 THEN
        LOCATE 21, 20: PRINT "Invalid Number ! Press any key..."
        SLEEP: GOTO mmn
END IF
IF C% = 4 THEN
  CLS
  LOCATE 10, 15: PRINT "PROGRAM TERMINATED BY THE USER,  PRESS ANY
KEY...."
  END
mnu:
END IF
'IF C% = 4 THEN GOTO REPORT
'GOTO OPENORSECRETE
IF C% = 1 THEN GOTO MAINTMENU
IF C% = 2 THEN GOTO COMPMENU
IF C% = 3 THEN GOTO REPORTMENU
'******************************* EOP ********************
```