

**TITLE PAGE**

**A COMPUTERISED RESOURCES ALLOCATION  
( BEDSPACE ALLOCATION )**

A PROGRAM DESIGN AND PROGRAM

*By*

**SUMBABI UMORU**

PGD/ MCS /96 /97/252

**A PROJECT SUBMITTED TO THE DEPARTMENT OF  
MATHEMATICS AND COMPUTER SCIENCE  
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE  
AWARD**

*OF*

**POST GRADUATE DIPLOMA IN COMPUTER SCIENCE.  
THE FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA  
NIGER STATE**

SEPTEMBER, 2001.

# APPROVAL PAGE

This project has been read and approved as meeting the partial requirement for the award of post graduate Diploma in computer science, of the Department of Mathematics and Computer Science, Federal University of Technology, Minna.

---

RESEARCH PROJECT  
SUPERVISOR

---

DATE

---

HEAD OF DEPARTMENT

---

DATE

---

DEAN SSSE

---

DATE

---

EXTERNAL EXAMINER

---

DATE

# **DEDICATION**

This research project is dedicated to my wife MRS MARTHA SUMBABI and to my daughter Ruth SUMBABI. I appreciate their co-operation during the course of this program.

# ACKNOWLEDGEMENT

I thank almighty God for the successful accomplishment of my Post Graduate Diploma program in Federal University of Technology, Minna, for providing me with the energy and endurance needed to withstand the pressures of academic endeavours. Mal. Audu Isah the supervisor of this project, has effected a remarkably efficient and prompt corrections. I extend my sincere gratitude to you sir. I express my gratitude to the Head of Department, Dr. S.A Reju.

I am indeed grateful to all lecturers who in one way or the other assisted to see the success of this project.

finally express my sincere appreciation to my friends especially Mallam Abdulraman Sirajo, colleagues and others, who in no small amount have contributed in one way or the other in seeing to the completion of this project.



# **ABSTRACT**

Resources allocation in the context of this work is the generation of random numbers as an approach to allocation of resources, precisely, the allocation of bedspace to the students. Using basic programming language the program is so designed such that as the student affair unit supplies the data on the way they want the bedspace to be allocated school by school, level by level and according to sex. This program is programmed to carry out the bedspace allocation un bias.

# TABLE OF CONTENT

<b>TABLE OF CONTENT.</b>	<b>PAGE</b>
Title page	i
Approval page	ii
Dedication	iii
Acknowledgement	iv
Abstract	v
Table of content	vi-vii
 <b>CHAPTER ONE</b>	
<b>INTRODUCTION</b>	
1.1 Background of the study	1
1.2 Purpose of the study	2
1.3 Scope and limitation of the study	2
1.4 Significance of the study	3
1.5 Defination of terms used	5
 <b>CHAPTER TWO</b>	
<b>LITERATURE REVIEW</b>	
2.1 Introduction	7
2.2 Resources allocation	7
2.3 Basic programing language	8
 <b>CHAPTER THREE</b>	
<b>PROGRAM METHODOLOGY</b>	
3.1 Program files	11
3.2 Algorithm (flow chart)	13

## **CHAPTER FOUR**

### **ANALYSIS OF THE PROGRAM STUDY**

4.1 Analysis of the program / study	16
-------------------------------------	----

## **CHAPTER FIVE**

### **FINDIING RECOMMENDATION AND CONCLUSION.**

5.1 Findings	28
--------------	----

5.2 Recommendations	29
---------------------	----

5.3 Conclusion	31
----------------	----

<b>Bibliography</b>	<b>32</b>
---------------------	-----------

<b>APPENDIX I : Bedspace.Fi l Program</b>	<b>34</b>
---	-----------

**II: DISK**

# CHAPTER ONE

## GENERAL INTRODUCTION

### 1.1 BACK GROUND OF THE STUDY.

Computer which is known to some as the “mind tool” is an electric device which accept and process data by following a set of instruction (program) to produce an accurate and efficient result (information) Ayo, C.K (1994).

Early recorded history reveals examples of local hand – operated devices such as the ABACUS. This ancient calculating instrument has been used for the past 200 years. Other devices used in the early history of computation are; astrolables, Nappies bones, Analytical engine etc, useful in such activities as commerce, multiplying and dividing and navigation. About 1950, advances in electronics paved the way for a “computer Revolution” of explosive growth and fruitfulness. This wiped, the narrow concepts of what computers are and what they can do in the minds of the people because their use have been revised and extend. Today computer are automatic fast, flexible, and inexpensive, with a wide range of capabilities, all to a previously unimaginable degree. Over the years, it has been demonstrated that computers can be programmed to carry out very logical complex task for example computation of results, admission process, resource allocation etc, which produces a remarkable proficiency.

Resources allocation in the context of this research work is the generation of random numbers as an approach to allocation of resources. Precisely the allocation of hostel accommodation, a case study of the Federal Polytechnic, Bida.

## **1.2 PURPOSE OF THE STUDY**

The purpose of this research work is to provide a more efficient method of Bedspace allocation to the student s in the Federal Polytechnic, Bida and any other institution having similar problem of bedspace allocation.

The following objectives are pursued;

- (i) To obtain data on student population (i.e. those who applied for a bed) and the numbers of bedspace available.
- (ii) To match the student population with the available bed space via (randomization).
- (iii) To ensure that every student from various schools applied for a bedspace have equal opportunity of being selected to occupy a bedspace.

## **1.3 SCOPE AND LIMITATION OF THE STUDY**

The program which is bedspace allocation is written in basic programing language, which is an all –purpose programing language.

The students affairs division supplies the data on the numbers of the bedspace to be allocated to students school by school, level by level and according to sex. The

schools are; School of Business and management Studies (SBAM); School of Applied Art and Science (SAAS); School of Engineering Technology (SET); and School of Environmental Studies (SES). (see Appendix 2).

The students are made to apply for a bedspace in which application forms are issued out school by school, level by level and according to sex. It is the numbers of bedspace allocated to the students according to school, level and sex that will be supplied to the program in the computer, similarly, the numbers of those who applied for a bedspace according to schools, level and sex will be supplied into the program in which the computer will now generate randomly in accordance with the numbers of bedspace available for that school, at that level and for a particular sex without repeating any number.

It is important to note that the (spill –over and prep students) are exempted from this exercise, one of the reason could be that the pre- ND students have not fully join the full ND program and the spill overs are no longer regular students.

#### **1.4 SIGNIFICANCE OF THE STUDY**

This project will do a great work in helping the Federal Polytechnic on bedspace allocation to its students school by school, level by level and according to sex. This will go a long way in solving the problems encountered using balloting method. The balloting method is bias for this reason; if for instance in the school of

business and management, fifty bedspace is made available for all HND II students, there suppose to be fifty pieces of papers with the inscription “yes” while others with the inscription “No”.

The officer in charge of the balloting box can decide to drop only thirty pieces of papers having yes inscription while the remaining twenty bed space will be owned by the balloting officer who may decide to sale those bedspace to the students and make his own money. That is why students who went for balloting do say that in the whole school of BAM HND II students only fine students picked “yes” where are the remaining yes?

That is why this program has been designed to solve the problems encountered in balloting. In this program, the students executive or representative will be made to sit before the computer and all the data for bedspace allocation are made available before everybody. The computer is operated and all data are supplied into it, it then generates numbers randomly which will stand for those students that are lucky. These numbers are immediately printed out and issued out to them as the result, and those who are successful will see their application form numbers appearing on the notice board. And those who did not see their numbers will take it in good fate. The numbers randomly generated will be in accordance with the number of bedspace allocated to that school at that level and for the sex concern.

## **1.5 DEFINITION OF TERMS**

**ABACUS:** - An instrument for making calculation by sliding counters along rods or groove.

**ASTROLABLE:** - An instrument for observing the position of celestial bodies

**BASIC:** - Acronym for beginners all -purpose symbolic instructional code. Basic is a computer programming language developed at Dartmouth college as an instruction tools in teaching fundamental programming concepts.

**BYTE:** An element of data which is composed of eight bits plus a parity bit, and represent either one alphabetic or special character two decimal digits or eight binary bits.

**CAL:** - Acronym for computer aided learning. This is the general term used to describe virtually any learning activities that are promoted by a computer or in which a computer is involved.

**COMMAND:** - A pulse, signal, word or series of letters that tells a computer to start, stop or continue an operation in an instruction.

**COMPILER:** - A compiler program that translates a program written in a problem-oriented language into a program of instruction similar to, or in, the language of the computer.

**CRT:** An acronym for cathode ray tube.

**DRIVE:** A device that holds and manipulates magnetic media so that the central processing unit (CPU) can read data from or write data to them.



**FILE:** A collection of related data or programs that is treated as a unit by the computer.

**FLOWCHART:** These are flow diagrams that describe sequence of data – handling operations performed within a computer.

**FUNCTION KEYS:** Specific keys on the keyboard that, when pressed instruct the computer to perform a particular operation. The function of the keys is determined by the application program being used.

**INTER-PRINTER:** A program that reads, translates and executes a user's program, such as one written in the basic language, one line at a time. A compiler on the other hand, reads and translate the entire user's program before executing it.

**PROGRAM:** A series of instruction or statements in a form acceptable to a computer, designed to cause the computer to execute a series of operations.

**BED:** A piece of furniture, or other arrangement, on which to sleep.

**SPACE:** In that context of this project is an un-occupied place or area.

**SBAM:** School of Business and Management.

**RANDOM NUMBERS:** Collection of numbers that are generated from the sample.

# CHAPTER TWO

## LITERATURE REVIEW

### 2.1 INTRODUCTION

The purpose of this chapter is to review literatures that are related to the study.

### 2.2 RESOURCE ALLOCATION

Population explosion in institution of higher learning and related topics have been drawing much attention of scholars and researchers in recent times. Equally of interest has been the issue of provision of adequate facilities in our higher institution and allocation of the few available resources to meet the needs of the students. Most especially the allocation of hostel accommodation to students.

Ndibunwa, et al (1994) who carried out a statistical analysis of students admission in Federal Polytechnics Bida from 1990- 93 at ND and HND level, observed that the rate at which students were admitted into the ND and HND program was on the increase annually and as result there has been a problem of how the few available resources could be shared among the thickly Pilation of the students precisely the allocation of bedspace.

Jaiye Yemi, et al (1994) also in their research work on statistical survey on housing facilities in Federal Polytechnic, Bida reported that there was inadequate provision of accommodation and other facilities for students of the Polytechnic.

They suggested that, improvement on the sorry state of affairs by providing more accommodations and other facilities for the student, will solve the problem of accommodation and it will go a long way to enhance students performance academically and otherwise.

In this project work, effort will be made on finding out the best method for resource allocation with a focus on allocation of bedspace using Q Basic programing through the technique of random generation of numbers.

### **2.3 BASIC PROGRAMMING LANGUAGE**

Basic has become a popular programing language; it is also an example of a language translator that operates in an interpretive fashion. The language is available in most computer system, as Philip Baker (1987) pointed out “ In many micros a basic interpreter is often built into ROM (read only memory) and so is immediately available as soon as the computer is powered – up. Other micros provide access to basic through the use of disc – based programs that can be loaded into the computers memory before it is used. In larger computers, the basic system is usually provided as standard programing tools that is part of the computer’s software library.

Basic programming is mostly used in computer-assisted learning (CAL). The area being used for application of this CAL techniques are mathematics, science and engineering. Basic today is being used as an aid for the teaching of mathematics at the secondary school level (using a micro computer), which has been, describe by old know (1984). He gave several points about the relevance of basic as a tool for problem solving of CAL. Which include.

1. The belief that mathematicians should adopt to using computers.
2. That certain mathematical problems are not easily solved (or insoluble) without a computer, and
3. That the high – resolution colour graphics on a cathode ray tube (CRT) is a useful way of displaying the nature and behaviours of mathematical functions.

Harkens and Morice (1975) also believe that “the logic of computer programming makes it a useful dicipline in the teaching of problem solving in engineering in addition to its direct utility as a calculation device”.

There are different versions of basic language. Leintz (1976) made a comparison of ten early versions of the basic language. There were also available on a number of different time shaving computer systems. Although there were some similarities between them, there were also many differences. This observation, coupled with the worry that significant differences between basic dialects might hamper program portability, added considerable support to the growing feeling that some form of standardization discussions were undertaking by the American National

Standard Institution (ANSI, 1978) who formulated recommendation for a standard 'minimal' basic subset. This standard (known as X 3.60) contained a list of features and recommendations to which (for acceptability) all basic dialects of the language should comply.

Early versions of basic were severely criticized because they did not contain facilities for the development of the 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 (for example QBASIC is an extension of basic programming language). Current enhancements to basic are proceeding in the direction of improving its "user interface" for example at present, there is much interest in the use of windows, pull down menus, and mouse interaction.

# CHAPTER THREE

## (PROGRAM METHODOLOGY)

### 3.1 PROGRAM FILES

The program is made up of three files namely Q BASIC EXE, BEDSPACE. BAT, and BEDSPACE FIL, and all of which are in a subdirectory named TAWARI and necessary for the running of the program.

#### 3.1.1 Q BASIC, EXE.

This is a software designed by (Microsoft Corporation). It is the “brain behind the operation “ with 7,856 bytes. Q basic language is a simply, easy to learn, easy to use computer programing language with English like statements and mathematical notations. One can write both simple and complex programs and also be able to modify existing software that is written in Q basic.

The programmer select Q basic which is one of the many versions of Basic programming language and an interpreter program and not PASCAL, COBOL, or FORTRAN that needs a compiler program before being run due to the following reasons.

1. Interpreter are often more convenient to use than compilers, because with an interpreter the program is executed in one step, where as with compiler, we need two steps – translation and execution.

2. Interpreters are very useful for debugging purposes, but with a compiler, the whole program must be error free before it can be executed to obtain any result.
3. Composition requires that both source program and object programs be stored while for interpreters there is no object program stored, only the source program has to be stored. This feature often makes interpreters preferable to compilers for very small computers (Kola, 1997).

### **3.1.2. BEDSPACE. BAT**

This is a batch file, which loads Q BASIC EXE. Program into the computer memory and then run the BEDSPACE. FIL file, which contains programs written in Q BASIC. It has 79 bytes of space and can easily be viewed by typing the DOS command: TYPE BED SPACE. BAT (regardless of capital or small letters). The following output is seen on the screen if the command is issued at the TAWARI subdirectory:

```
ECHO OFF
```

```
CLS
```

```
ECHO please wait-----
```

```
CLS
```

```
Q BASIC BEDSPACE. FIL.
```

### **3.1.3 BEDSPACE FIL**

This is the Q basic program file carefully written by the programmer. It contains 7,856 bytes of space. The flow chart on (18x) best illustrate how the

programed. Further more, chapter four contains the analysis of the program and the print out of the BEDSPACE FIL file is shown on (Appendix 1)

### **3.2 ALGORITHM (FLOW CHART)**

According to Adewale (1997) “An algorithm is a finite set or sequence of instructions or operation for carrying out a specific procedures task”. An Algorithm can involve arithmetic, algebraic, logical and other types of procedures and illustrations.

In general, algorithms can be represented by one of the following:

1. pseudocodes
2. N. s (Nassi – shneiderman) diagram
3. Flow chart
4. English language or
5. Formulae

The programmer used flow chart since it is very easy to understand due to its diagrammatic nature. The following are some of the symbols used in the flow – chart;



START / STOP

INPUT/OUTPUT  
SYMBOL

PROCESSING  
OPERATION

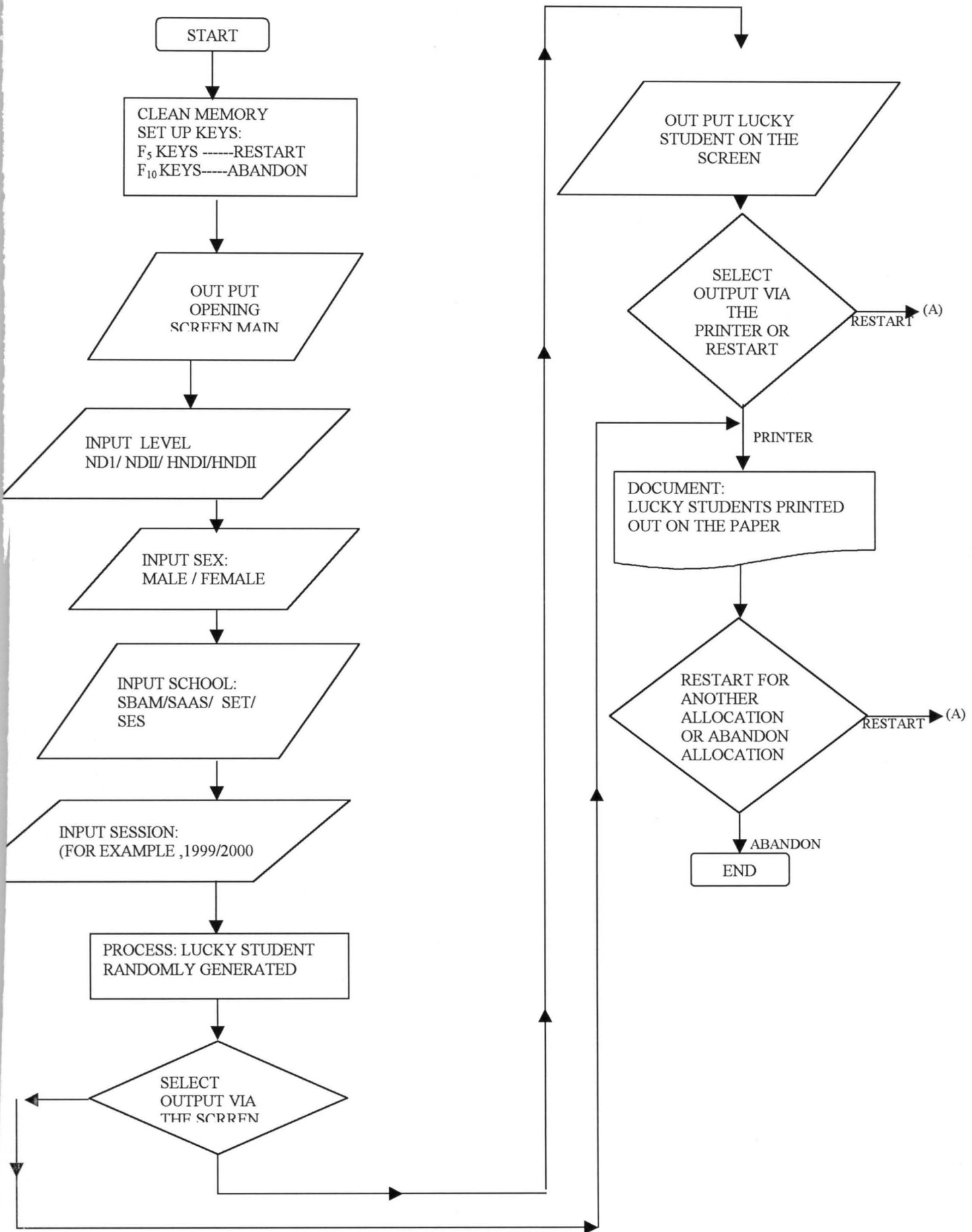
DOCUMENT  
(OUTPUT PAPER)

DECISION  
BOX



FLAWS-LINES

# BEDSPACE.FIL FLOWCHART



# CHAPTER FOUR

## (ANALYSIS OF THE PROGRAM)

This chapter will analyse how the program is runned, numbers randomly generated and are viewed on the screen / printed out . It will serve as the basis (program instruction booklet) which is a new operator needs to read before he goes into BEDSPACE ALLOCATION. From one careful reading of the chapter, we will gain a firm command of the three essentials, objectives, control and allocation. We will know what we want, learn the rudiments of how to operate the program and to see how the Bedspace are allocated, school by school, level by level and according to sex.

After booting the computer, we then type CD/ TAWARI and press enter key to change to TAWARI subdirectory if we are using drive C (HARD DISK)or slot in the disk which contains the program into its appropriate drive and then change to TAWARI subdirectory. Type “BEDSPACE” (all commands typed are regardless of upper or lower case letter) and press enter key for the program to be loading into the computer memory. “ Please wait-----! Appears at the top left side of the screen and after some seconds the screen clears and the following output is seen on the screen with some sounds: first Fig 4.1 appears on the screen.

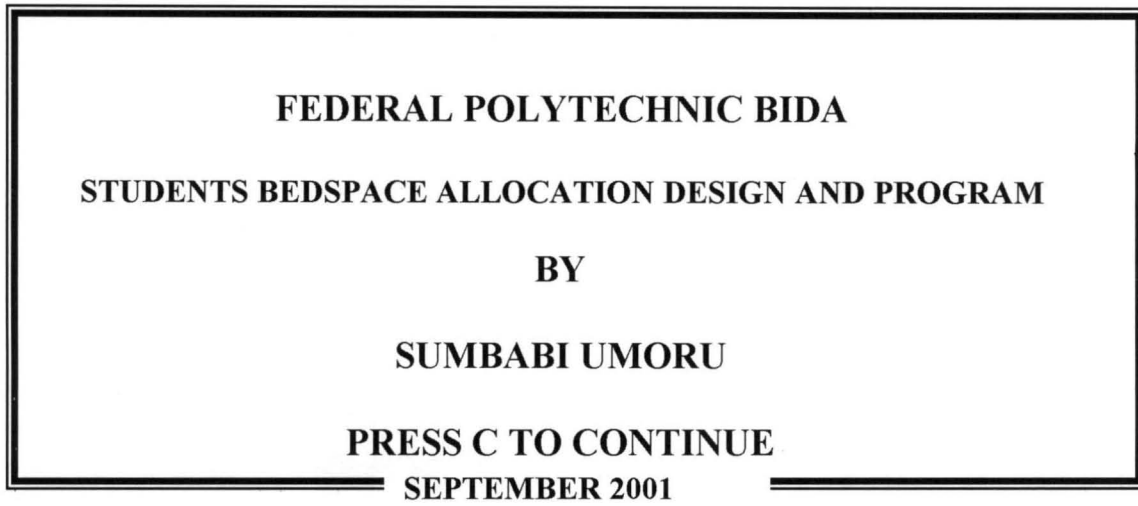


Fig. 4.1 (the main menu that introduces the operator to bedspace allocation)

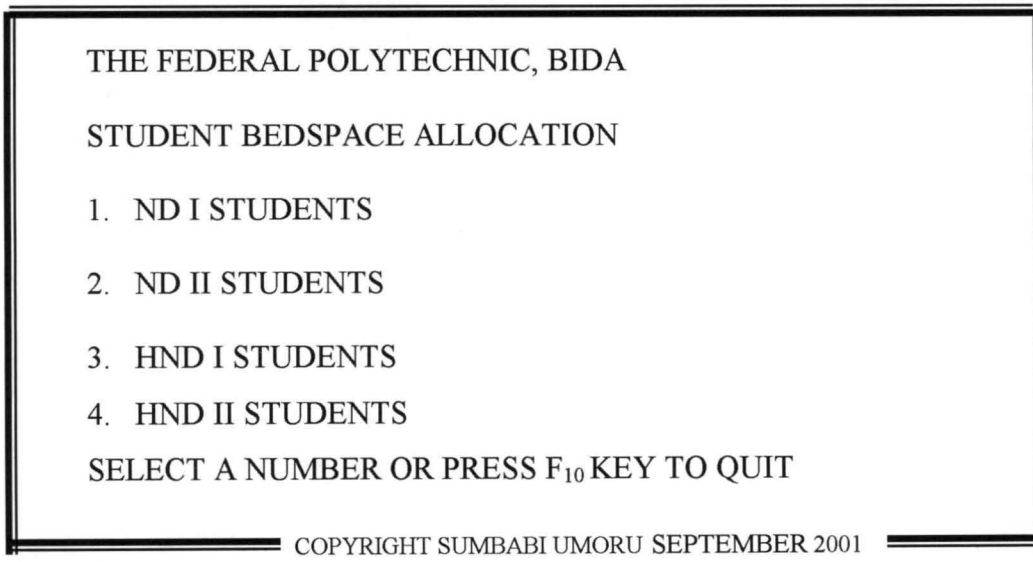


Fig 4.2 (students by level main menu)

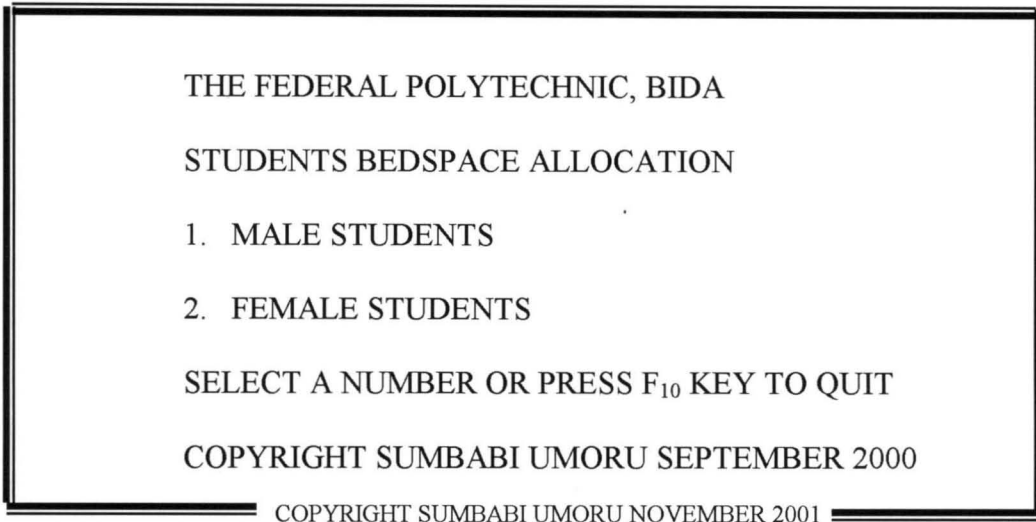


Fig 4.3 (students by sex)

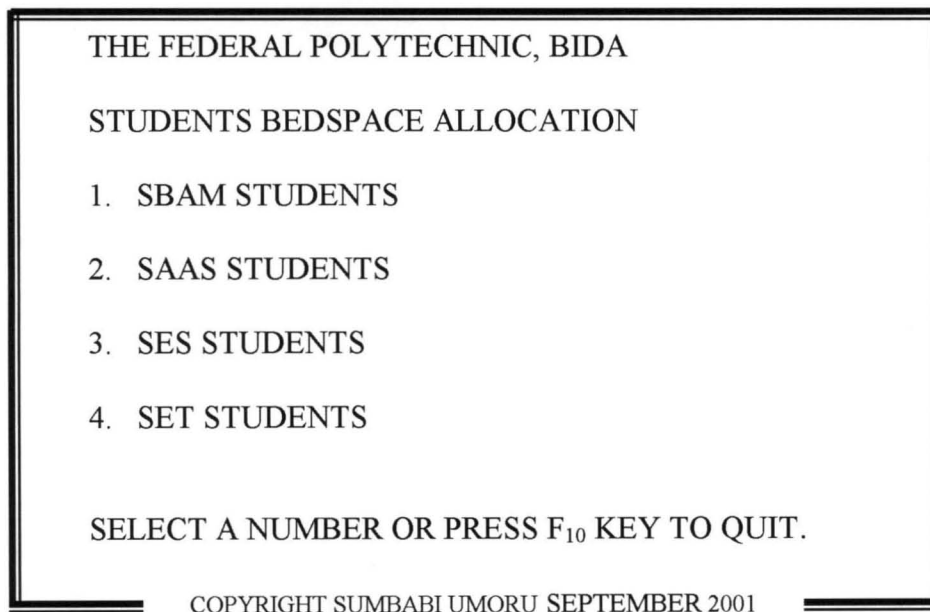


Fig 4.4 (students by schools)

THE FEDERAL POLYTECHNIC, BIDA

STUDENTS BEDSPACE ALLOCATION

SESSION (e.g. 1989/99, 1999/2000)?

COPYRIGHT SUMBABI UMORU SEPTEMBER 2001

Fig 4.5 (Input session and press enter key)

```
THE FEDERAL POLYTECHNIC, BIDA  
STUDENTS BEDSPACE ALLOCATION  
HOW MANY BEDSPACE AVAILABLE FOR SBAM  
AND I MALE STUDENT?  
HOW MANY ND I MALE STUDENTS  
APPLY FROM SBAM ?  
COPYRIGHT SUMBABI UMORU SEPTEMBER 2001
```

Fig 4.6 (input number of bedspace available school by school and according to sex .press enter key. Then input number of students that apply for a bedspace school by school and according to sex. Press enter key

```
THE FEDERAL POLYTECHNIC, BIDA  
STUDENTS BEDSPACE ALLOCATION  
1 LIST STUDENTS ON THE SCREEN  
3. PRINT OUT LUCKY STUDENTS FROM THE PRINTER  
SELECT A NUMBER OR PRESS F10 KEY TO QUIT  
COPYRIGHT SUMBABI UMORU SEPTEMBER 2001
```

Fig 4.7 (the numbers has been randomly generated and selection is to be made as to whether the computer should list the numbers of the lucky students on the screen or to print the numbers of the lucky students on the printer).

THE FEDERAL POLYTECHNIC, BIDA

STUDENTS BEDSPACE ALLOCATION

1999 / 2000 SESSIONAL

SCHOOL OF BAM ND I MALE STUDENTS

S/NO	PPPL N0
1	12
2	25
3	17
4	44
5	4
6	1
7	50
8	16
9	31



10	38
11	60
12	54
13	43
14	23
15	21
16	22
17	35
18	59
19	56
20	58
21	62
22	33
23	65
24	48
25	67
26	24
27	2
28	32
29	10
30	13

PRESS C TO CONTINUE

THE FEDERAL POLYTECHNIC, BIDA

STUDENTS BEDSPACE ALLOCATION

1999 /2000 SESSION

SCHOOL OF BAM ND I MALE

S/ NO.    APPL. NO

31            55

32            47

33            6

34            39

35            9

36            30

37            3

38            15

39            45

40            66

41	68
42	42
43	34
44	40
45	46
46	64
47	18
48	61
49	5

PRESS C TO CONTINUE.

COPYRIGHT SUMBABI UMORU NOVEMBER 2001

Fig 4.8 (number of lucky SBAM ND I students bedspace allocation is being listed on the scree). That is a sample of a randomly generated numbers by the computer. As only 49 bedspace is available for SBAM ND I MALE STUDENTS and 70 students applied for a bedspace and out of the 70 numbers that applied for a bedspace, the computer generates 49 numbers randomly.

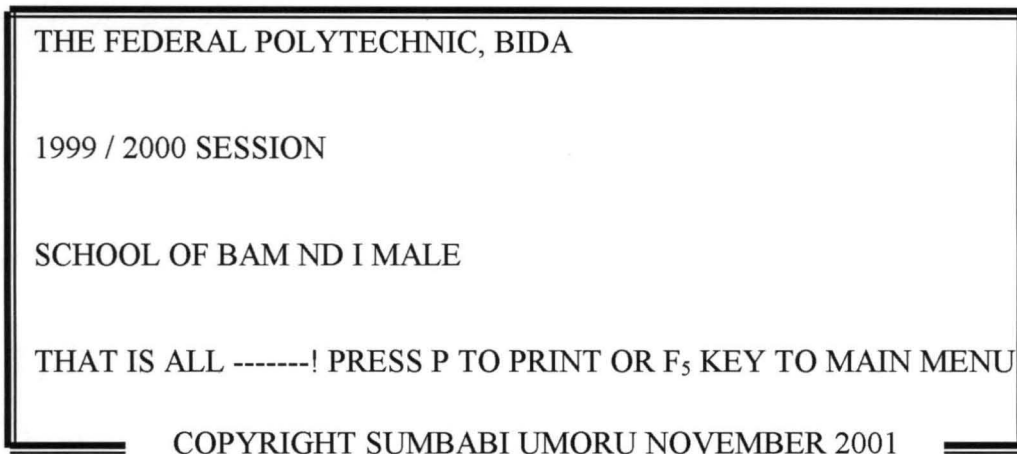


Fig 4.9 (for now press p to print or F<sub>5</sub> key to main menu).

For more explanation on how the programme is being run for the Bedspace allocation, it is important to note that throughout this programme pressing F<sub>5</sub> key at any time when we are running the programme will take us to the main menu and similarly pressing F<sub>10</sub> key at anytime when running the programme will take us back to TAWARI subdirectory where we have to type TAWARI and press Enter key before we can run the programme again.

We then press F<sub>5</sub> for the main menu, which is just as shown in Fig. 4.2. Therefore, Fig 2 – Fig 9 shows how the programme is being run. In figure 4.2 we are given four options as to which of the ND or HND level you want to carry out the allocation of bedspace.

The selection is made by pressing any of the numbers on the key board or pressing F<sub>10</sub> key to quit.

Next, if any number is selected (for example 1) Fig 4.3 appears on the screen it gives two options of either the bedspace allocation to be carried out is for the male students or for the female students. Pressing 1 implies we are allocating Bedspace to the male students and 2 implies for female students (pressing 1 for example for male)

Next Fig .4.4 appears on the screen showing students school by school. Here we have four options to choose by pressing any of the numbers on the key board indicating the school we are allocating Bedspace to. (press 1 for example) on the key board to mean we are allocating Bedspace to school of BAM ND1 MALE STUDENTS.

Next fig .4.4 appears on the screen where the session is inputted as shown in fig .4.3. Pressing Enter key, appears fig.4.5 where the number of available bedspace for that level particular sex is inputted; (say 49 Bedspace) pressing Enter key appears another question to supply the number of students that apply for a bedspace from school of BAM ND 1 MALE STUDENTS. Inputting the number (say 70 students applied) press Enter key, then the computer will now randomly generate 49 numbers out of the 70 numbers of students that applied without repeating any number.

Fig.45 now appears on the screen as Enter key is pressed and the number has been randomly generated. Here there are two options either the number of the lucky students to be listed on the screen or printed out from the printer. Pressing

1 on the key board, next the screen will display all the numbers of the lucky students from school of BAM ND 1 MALE STUDENTS who have secured a bedspace. On the screen, similarly, pressing 2 will give the computer the command to print all the randomly generated numbers from the printer. (as in Fig 4.8)

# CHAPTER FIVE

## (FINDINGS, RECOMMENDATIONS, AND CONCLUSION)

### 5.1 FINDINGS

Using the method of random generation of numbers as being analysed in this project work, allocation of Bedspace to students becomes easier and it gives every student equal opportunity of being selected as against the balloting method that is bias. However the programmer observes that (1) If the numbers that applied is less or equal to the number of bedspace available for that school it is automatic for all students.

- (2) After the numbers has been randomly generated, the result can be moved directly to the printer by pressing 2 on the key board without viewing it on the screen to avoid selfish interest. (i.e. if the operator has interest on any number and if that number did not appear on the screen he may want to repeat the exercise again).
- (3) The generation of numbers is not to be repeated twice but to be done only once and the result to be printed on a hard cover to placed on the students' notice board.
- (4) The randomly generated numbers is not to be saved as no file name is given to it. The reason why file name for it to be saved is not given, it is to avoid any alteration due to selfish interest.

## 5.2 RECOMMENDATION

There are many things we could have added to the programme to make it more better than what it is now, but due to some reasons, we just have to make it as it is now.

The programmer therefore, comes out with the following recommendations:

(1) Other programmers who are willing to write and improve on this program can do so. Some of its limitations include among other things.

(a) Joystick / mouse cannot be used to run this program.

(b) The randomly generated numbers could have been given a file name for it to be saved, but due to the reason given in my findings made it not possible so as to make this method more better than the bias method of balloting.

(2) There are different kinds of programs, and one can easily design a program. The programmer therefore, advises other who are willing to design programs to think of programs

(a) That shall motivate other programmer as to think of other program to designed

(b) That shall lead to problem solving.

(c) That shall be very educative, and



(d) That can make people to have the best method of solving their problems (i.e. Bedspace allocation).

### **5.3 CONCLUSION**

The purpose of this program is to solve the problem being encountered in allocating a bedspace to students in the Federal Polytechnic, Bida and any other institution having similar problem. The programmer was able to design the program in such a way that Bedspace allocation can be conveniently carried out school-by-school, level-by-level and according to sex with equal opportunity of being selected and the program can be used in any institution of learning in allocation of resources (Bedspace).

# **BIBLIOGRAPHY**

- 1 ANSI (1978): American National Standard Institutes inc, 1430 Broadway,  
New york, Ny 10018
2. Badamosi (1997): lecture given to P.G.D. Computer Science, Unpublished.
3. Banet, B. (1979): computer and early training; Calculations/ computers vol.  
3, p.17
4. Barker .P., (1987): Author Languge for CAL Macmillan Education LTD,  
London.
5. Bowden, B.v., (1953): Faster than thought, pitman, London
6. Christensen, B.R (1981): programming language for beginners:  
  
The global challenge; computer Bulletin. Series II, issue  
29, pp. 20 and 22.
7. Harkness, R.H. and Morice, P.B (1975):  
  
The computer in the teaching of engineering science. North  
Holland, Amsterdam.
8. Leintz .B.O (1976): A comparative Evaluation of version of BASIC:  
communications of the ACM. 19(4), 175 - 181
9. Oldknow, A. (1984): Learning Mathematics with Micro – computers in E.  
Ramsden (Ed), micro computers in education 2, Ellis Harwood, chicchester,  
pp.131 – 150.

10. O. Shea, T., and self J. (1988): Learning and Teaching with computers, Great Britain: The Harvester press LTD.
11. Wilkins, C.L. et al (1975): Digital Electronics and Laboratory Experiments, plenum, New York.
12. Kola, R. (1998): Lecture note given to PGD Computer science, Unpublished

```

REM ***** FEDERAL POLYTECHNIC BIDA *****
REM *
REM * STUDENTS BED SPACE ALLOCATION *
REM *
REM * DESIGN AND PROGRAM *
REM *
REM * BY *
REM *
REM * SUMBABI UMORU TAWARI *
REM *
REM ***** SEPTEMBER, 2001 *****
KEY OFF
CLS : RESET: CLEAR
GOSUB 160
GOTO 320
ON KEY(5) GOSUB 1700
ON KEY(10) GOSUB 1800
KEY(5) ON
KEY(10) ON
RETURN
REM *****MAIN MENU*****
MM = 0: GOTO 431
CLS : AB$ = CHR$(21)
COLOR 12: FOR I = 6 TO 75: LOCATE 2, I: PRINT AB$: NEXT I
FOR I = 3 TO 23: LOCATE I, 6: PRINT AB$; AB$: NEXT I
FOR I = 3 TO 23: LOCATE I, 74: PRINT AB$; AB$: NEXT I
COLOR 6: LOCATE 4, 63: PRINT DATE$
COLOR 25: LOCATE 6, 25: PRINT "THE FEDERAL POLYTECHNIC, BIDA."
COLOR 14: LOCATE 8, 25: PRINT "STUDENTS BED SPACE ALLOCATION"
IF MM THEN 430 ELSE 400
COLOR 12: FOR I = 6 TO 19: LOCATE 23, I: PRINT AB$: NEXT I
COLOR 5: LOCATE 23, 22: PRINT "COPYRIGHT SUMBABI UMORU TAWARI (SEPTEMBER,2
COLOR 12: FOR I = 68 TO 75: LOCATE 23, I: PRINT AB$: NEXT I
RETURN
MM = 1: GOSUB 330
MM = 0: LOCATE 10, 30: PRINT "DESIGN AND PROGRAM"
LOCATE 12, 38: PRINT "BY"
COLOR 18: LOCATE 14, 29: PRINT "SUMBABI UMORU TAWARI"
COLOR 4: LOCATE 16, 32: PRINT "SEPTEMBER,2001"
COLOR 12: FOR I = 6 TO 75: LOCATE 23, I: PRINT AB$: NEXT I
COLOR 21: LOCATE 21, 10: PRINT "PRESS C TO CONTINUE THE ALLOCATION OR F10
GOUND 100, 1: A$ = INKEY$
IF A$ = "C" OR A$ = "c" THEN 440 ELSE 438
REM *****SELECT LEVEL*****
GOSUB 330
COLOR 18: LOCATE 11, 30: PRINT 1; : COLOR 6: PRINT "ND I STUDENTS"
COLOR 18: LOCATE 13, 30: PRINT 2; : COLOR 6: PRINT "ND II STUDENTS"
COLOR 18: LOCATE 15, 30: PRINT 3; : COLOR 6: PRINT "HND I STUDENTS"
COLOR 18: LOCATE 17, 30: PRINT 4; : COLOR 6: PRINT "HND II STUDENTS"
COLOR 18: LOCATE 21, 22: PRINT "SELECT A NUMBER OR PRESS F10 KEY TO QUIT"
COLOR 6: PLAY "MB"
LOCATE 4, 9: PRINT TIME$
GOUND 100, 1
A$ = INKEY$: BA = VAL(A$)
IF BA = 1 THEN 590
IF BA = 2 THEN 600
IF BA = 3 THEN 610
IF BA = 4 THEN 620 ELSE 520
A$ = "ND I": GOTO 630
A$ = "ND II": GOTO 630
A$ = "HND I": GOTO 630
A$ = "HND II": GOTO 630
*****SEX OF STUDENTS*****

```

```

COLOR 18: LOCATE 12, 30: PRINT 1; : COLOR 6: PRINT "MALE STUDENTS"
COLOR 18: LOCATE 14, 30: PRINT 2; : COLOR 6: PRINT "FEMALE STUDENTS"
COLOR 18: LOCATE 21, 22: PRINT "SELECT A NUMBER OR PRESS F10 KEY TO QUIT"
COLOR 6: PLAY "MB"
LOCATE 4, 9: PRINT TIME$
SOUND 100, 1
B$ = INKEY$: AB = VAL(B$)
IF AB = 1 THEN 740
IF AB = 2 THEN 750 ELSE 690
SEX$ = "MALE STUDENTS": GOTO 760
SEX$ = "FEMALE STUDENTS": GOTO 760
REM *****SELECT SCHOOL *****
GOSUB 330
COLOR 18: LOCATE 11, 30: PRINT 1; : COLOR 6: PRINT "SBAM STUDENTS"
COLOR 18: LOCATE 13, 30: PRINT 2; : COLOR 6: PRINT "SAAS STUDENTS"
COLOR 18: LOCATE 15, 30: PRINT 3; : COLOR 6: PRINT "SES STUDENTS"
COLOR 18: LOCATE 17, 30: PRINT 4; : COLOR 6: PRINT "SET STUDENTS"
COLOR 18: LOCATE 21, 22: PRINT "SELECT A NUMBER OR PRESS F10 KEY TO QUIT"
COLOR 6: PLAY "MB"
LOCATE 4, 9: PRINT TIME$
SOUND 100, 1
C$ = INKEY$: CA = VAL(C$)
IF CA = 1 THEN 910
IF CA = 2 THEN 920
IF CA = 3 THEN 930
IF CA = 4 THEN 940 ELSE 840
SC$ = "SCHOOL OF BAM": GOTO 950
SC$ = "SCHOOL OF SAAS": GOTO 950
SC$ = "SCHOOL OF SES": GOTO 950
SC$ = "SCHOOL OF SET": GOTO 950
REM *****SESSION*****
GOSUB 330
COLOR 6: LOCATE 11, 15: INPUT "SESSION (e.g. 1999/2000, 2000/2001)"; SS$
IF LEN(SS$) = 9 THEN 990 ELSE BEEP: GOTO 970
REM ***** BEDSPACE AVAILABLE & NUMBER OF STUDENTS THAT APPLY *****
GOSUB 330
COLOR 12: LOCATE 11, 10: PRINT "HOW MANY BEDSPACE AVAILABLE FOR "; SC$; "
LOCATE 13, 10: PRINT SEX$; : COLOR 6: INPUT BSA
IF BSA < 1001 THEN 1040 ELSE BEEP: GOTO 1020
COLOR 12: LOCATE 16, 10: PRINT "HOW MANY "; L$; " "; SEX$; " APPLY FROM "
COLOR 6: INPUT NSA
IF BSA < NSA THEN 1070 ELSE GOTO 1442
LOCATE 19, 35: COLOR 29: PRINT "PLEASE WAIT ...!"
RANDOMIZE TIMER
REM *****LUCKY STUDENTS RANDOMLY GENERATED *****
FOR I = 1 TO 5: SOUND 500, 10: SOUND 400, 10: NEXT I
DIM A(BSA): AJ = BSA: AK = NSA
FOR I = 1 TO AJ
A(I) = INT(RND * AK)
IF A(I) = 0 THEN 1130
IF A(I) > 0 THEN 1160 ELSE 1190
FOR W = 1 TO (I - 1)
IF A(I) = A(W) THEN 1130 ELSE 1180
NEXT W
NEXT I
REM***** PRINT AND LPRINT LUCKY STUDENTS *****
GOSUB 330
COLOR 18: LOCATE 11, 20: PRINT 1; : COLOR 6: PRINT "LIST STUDENTS ON THE
COLOR 18: LOCATE 13, 20: PRINT 2; : COLOR 6: PRINT "PRINT OUT LUCKY STUD
COLOR 18: LOCATE 21, 22: PRINT "SELECT A NUMBER OR PRESS F10 KEY TO QUIT
COLOR 6: PLAY "MB"
9. PRINT TIME$

```

```

0 IF BA = 1 THEN 1335
0 IF BA = 2 THEN 1450 ELSE 1260
0 REM *****LUCKY STUDENTS ON THE SCREEN *****
1 CLS : LOCATE 2, 27: COLOR 12: PRINT "THE FEDERAL POLYTECHNIC, BIDA"
2 COLOR 13: LOCATE 3, 27: PRINT "STUDENTS BEDSPACE ALLOCATION"
9 LOCATE 4, 32: COLOR 7: PRINT SS$; " SESSION"
0 COLOR 27: LOCATE 5, 25: PRINT SC$; " "; L$; " "; SEX$
0 COLOR 6: LOCATE 6, 3: PRINT "S/N APPL. NO. ": RETURN
5 GOSUB 1310
0 K = 6: FOR I = 1 TO AJ: K = K + 1
0 LOCATE K, 3: PRINT I; " "; A(I): N = 15
0 FOR M = 1 TO 30: IF I = 15 * M THEN 1380 ELSE 1370
0 NEXT M: GOTO 1420
0 COLOR 21: LOCATE 23, 20: PRINT "PRESS C TO CONTINUE ....";
0 COLOR 6: A$ = INKEY$
0 IF A$ = "C" OR A$ = "c" THEN 1410 ELSE GOTO 1390
0 K = 6: GOSUB 1310
0 NEXT I
0 LOCATE 23, 12: PRINT "THAT IS ALL ...! PRESS P TO PRINT OR F5 KEY TO MAIN
0 A$ = INKEY$
1 IF A$ = "P" OR A$ = "p" THEN 1450 ELSE 1440
2 CLS : GOSUB 1310
3 COLOR 12: LOCATE 12, 20: PRINT "IT'S AUTOMATIC ...! FOR ALL THE STUDENTS.
4 FOR I = 1 TO 111111: NEXT I
5 DIM A(NSA): AJ = NSA: FOR I = 1 TO AJ: A(I) = I: NEXT I: GOTO 1200
0 REM *****LUCKY STUDENTS ON THE PRINTER *****
0 CLS : LOCATE 10, 20: COLOR 12: PRINT "HAVE YOU SET THE PRINTER AND READY
0 COLOR 21: LOCATE 19, 20: PRINT "PRESS P TO PRINT OR F5 KEY FOR MAIN MENU.
0 COLOR 6: A$ = INKEY$
0 IF A$ = "P" OR A$ = "p" THEN 1500 ELSE 1480
0 CLS : COLOR 26: PRINT "PRINTING ...!": Pg = 0: GOTO 1530
5 Pg = Pg + 1: LPRINT TAB(19); "-"; Pg; "-"
5 LPRINT TAB(10); "THE FEDERAL POLYTECHNIC, BIDA"
7 LPRINT TAB(10); "STUDENTS BEDSPACE ALLOCATION"
8 LPRINT TAB(15); SS$; " SESSION"
0 LPRINT TAB(8); SC$; " "; L$; " "; SEX$
0 LPRINT TAB(3); "S/N APPL. NO.": RETURN
0 GOSUB 1505
0 FOR I = 1 TO AJ: K = 4
0 LPRINT TAB(4); I; " "; A(I)
0 FOR M = 1 TO 30: IF I = 30 * M THEN 1580 ELSE 1570
0 NEXT M: GOTO 1620
0 COLOR 21: LOCATE 23, 20: PRINT "CHECK PAPER AND PRESS C TO CONTINUE..."
0 COLOR 6: A$ = INKEY$
0 IF A$ = "C" OR A$ = "c" THEN 1610 ELSE 1590
0 GOSUB 1505
0 LPRINT : NEXT I
0 CLS : LOCATE 23, 20: PRINT "THAT IS ALL ...! PRESS F5 KEY FOR MAIN MENU..
0 A$ = INKEY$
0 GOTO 1640
0 REM *****RESTART THE ALLOCATION*****
0 RETURN 10
0 REM *****ABANDON BEDSPACE ALLOCATION *****
0 CLS : COLOR 12: LOCATE 12, 10: PRINT "BYE NOW FROM STUDENTS BEDSPACE ALLO
0 COLOR 6: RESET: SYSTEM

```