K. J. Somaiya College of Engineering, Mumbai-77

(A Constituent College of Somaiya Vidyavihar University)

Batch: G3	**Roll No.: 16010421063**
Experiment / assignment / tutorial No. 10	
Grade: AA / AB / BB / BC / CC / CD /DD	
Signature of the Staff In-charge with date	

TITLE: Application Oriented Program

AIM: To develop any application based program.

Expected OUTCOME of Experiment:

C01: Formulate a problem statement and develop the logic (algorithm/flowchart) for its solution.

C02: Apply basic concepts of C programming for problem solving.

C03: Illustrate the use of derived and structured data typessuch as arrays, strings, structures and unions

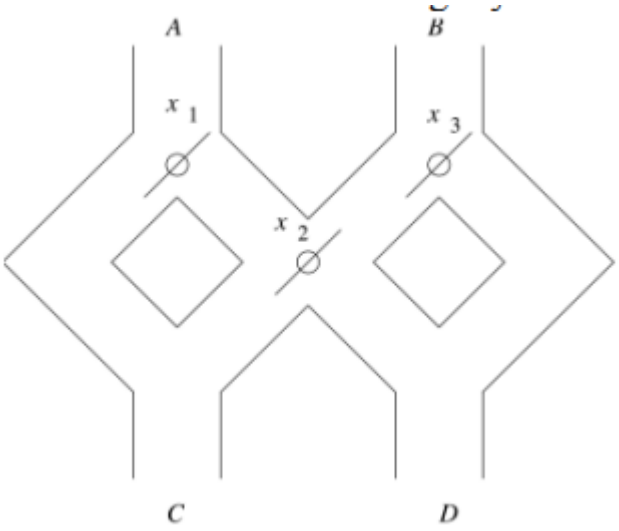
C04: Design modular programs using functions and demonstrate the concept of pointers and file handling.

Books/ Journals/ Websites referred:

1. Programming in C, second edition, Pradeep Dey and Manas Ghosh, Oxford University Press.
2. Programming in ANSI C, fifth edition, E Balagurusamy, Tata McGraw Hill.
3. Introduction to programming and problem solving , G. Michael Schneider ,Wiley India edition.
4. **http://cse.iitkgp.ac.in/~rkumar/pds-vlab/**

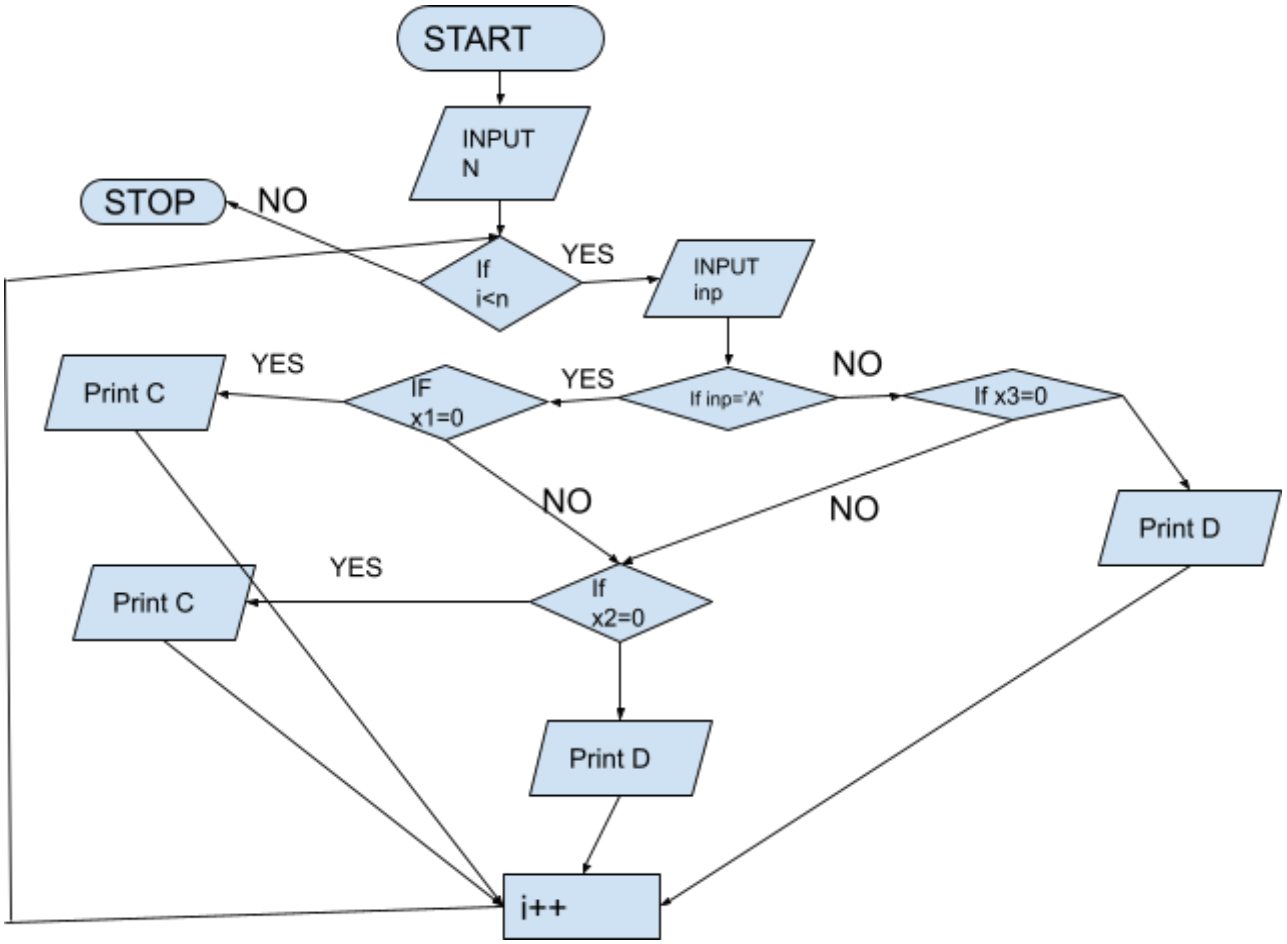
Problem Definition:

Consider the marble rolling toy as shown in figure:



A marble is dropped at A or B. Levers x1,x2 and x3 cause the marble to fall either to the left or to the right. Whenever a marble encounters a lever, it causes the lever to reverse the direction after the marble passes, so the next marble will take the opposite branch. Write a C program to accept an input sequence and generate the appropriate output sequence.

Flowchart:


START
INPUT N
STOP
NO
If i<n
YES
INPUT inp
Print C
YES
IF x1=0
YES
If inp='A'
NO
If x3=0
NO
NO
Print D
Print C
YES
If x2=0
Print D
i++

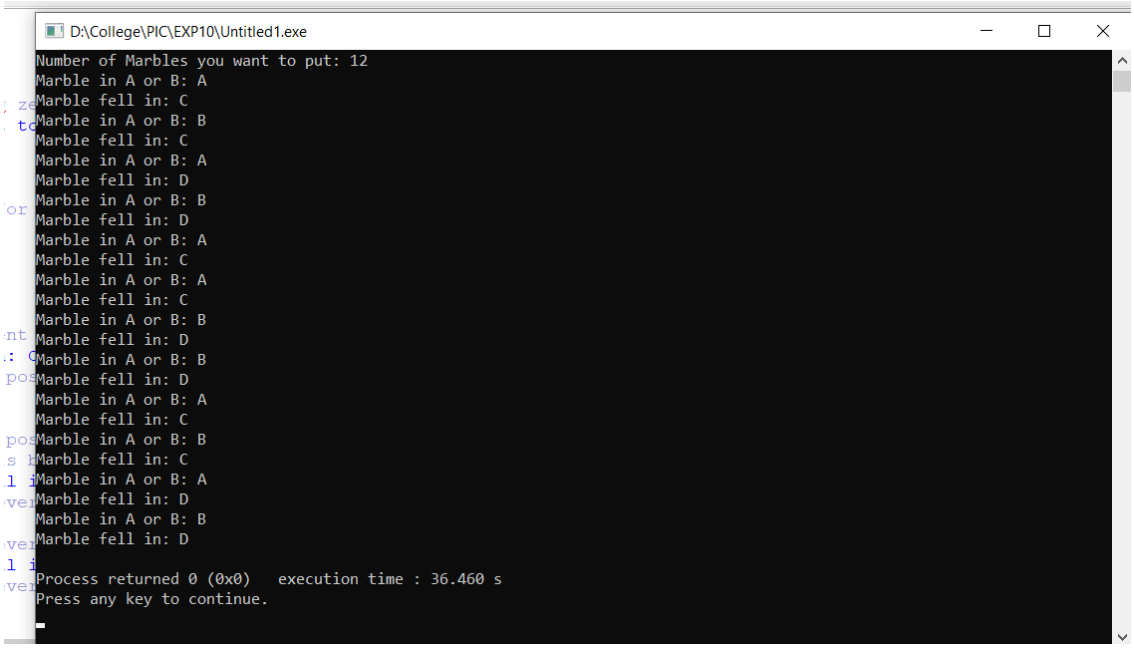
Implementation details:

```
#include<stdio.h>

int main()
{
    int x1=0,x2=0,x3=0; //Initialising zero for position '/'
    printf("Number of Marbles you want to put: ");
    int n;
    scanf("%d",&n);
    char inp;
    for (int i=0;i<n;i++)//Running a for loop for each marble
    {
        printf("Marble in A or B: ");
        scanf(" %c",&inp);
        if (inp=='A')
        {
            if(x1==0){//if lever is bent towards right it will
directly go into C
                printf("Marble fell in: C\n");
                x1=1;//changing lever position
            }
            else if(x1==1){
                x1=0;//changing lever position
                if(x2==0){//if lever is bent left it will go
into C
                    printf("Marble fell in: C\n");
                    x2=1;//changing lever position
                }
                else if(x2==1){//if lever is bent right it
will go into D
                    printf("Marble fell in: D\n");
                    x2=0;//changing lever position
                }
            }
        }
        else if (inp=='B')
        {
            if(x3==1){//if is bent towards right it will
directly go into D
```

```
                printf("Marble fell in: D\n");
                x3=0;//changing lever position
            }
            else if(x3==0){
                x3=1;//changing lever position
                if(x2==0){//if lever is bent left it will go
into C
                    printf("Marble fell in: C\n");
                    x2=1;//changing lever position
                }
                else if(x2==1){//if lever is bent left it will
go into D
                    printf("Marble fell in: D\n");
                    x2=0;//changing lever position
                }
            }
        }
    }
}
```

Output(s):



Conclusion:

Successfully solved the marble problem statement.

Date: _____ **Signature of faculty in-charge**