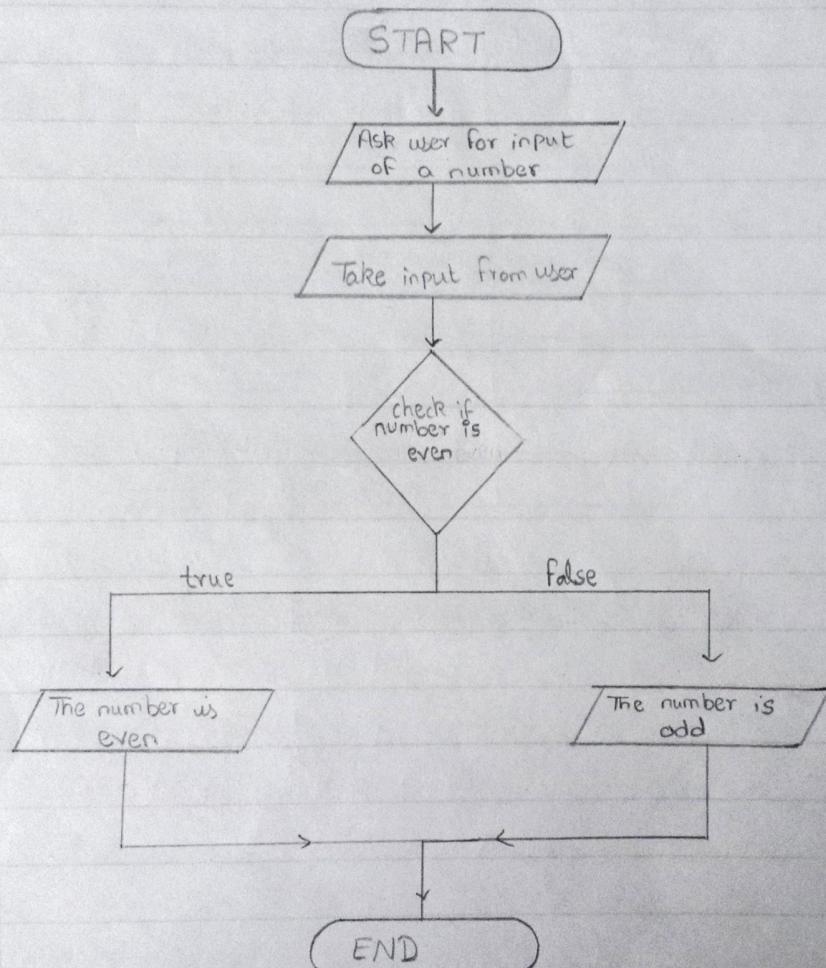


## Practical No. 02

Aim: Create, debug and run java programs based on decision making and branching.

Flowchart:



Flow chart : code 1

## Practical No. 02

Aim: Create, debug and run java programs based on decisions making and branching.

Theory:

What is branching?

→ When a break-of-flow occurs in a program and it jumps to another part of the code, it is called as branching. When branching is based on a condition, it is known as conditional branching.

When branching is not based on any conditions, it is known as unconditional branching.

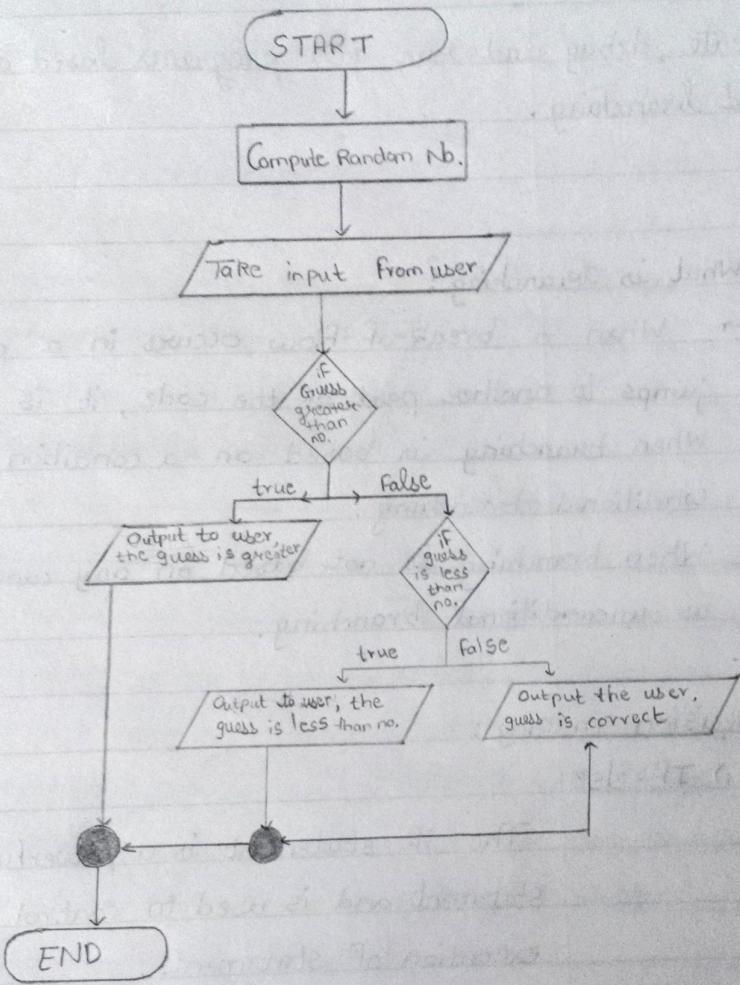
Decision making:i) IF - else

The if statement is a powerful decision making statement and is used to control the flow of execution of statements.

The if-else statement is the extension of the simple if statement.

If the test expression is true, then the true-block statement(s) immediately following if statement are executed.

Otherwise, the false block's statement(s) are executed.



Flow chart : code 2

Syntax:

```
if (condition){  
    // code statements  
} else {  
    // code statements  
}
```

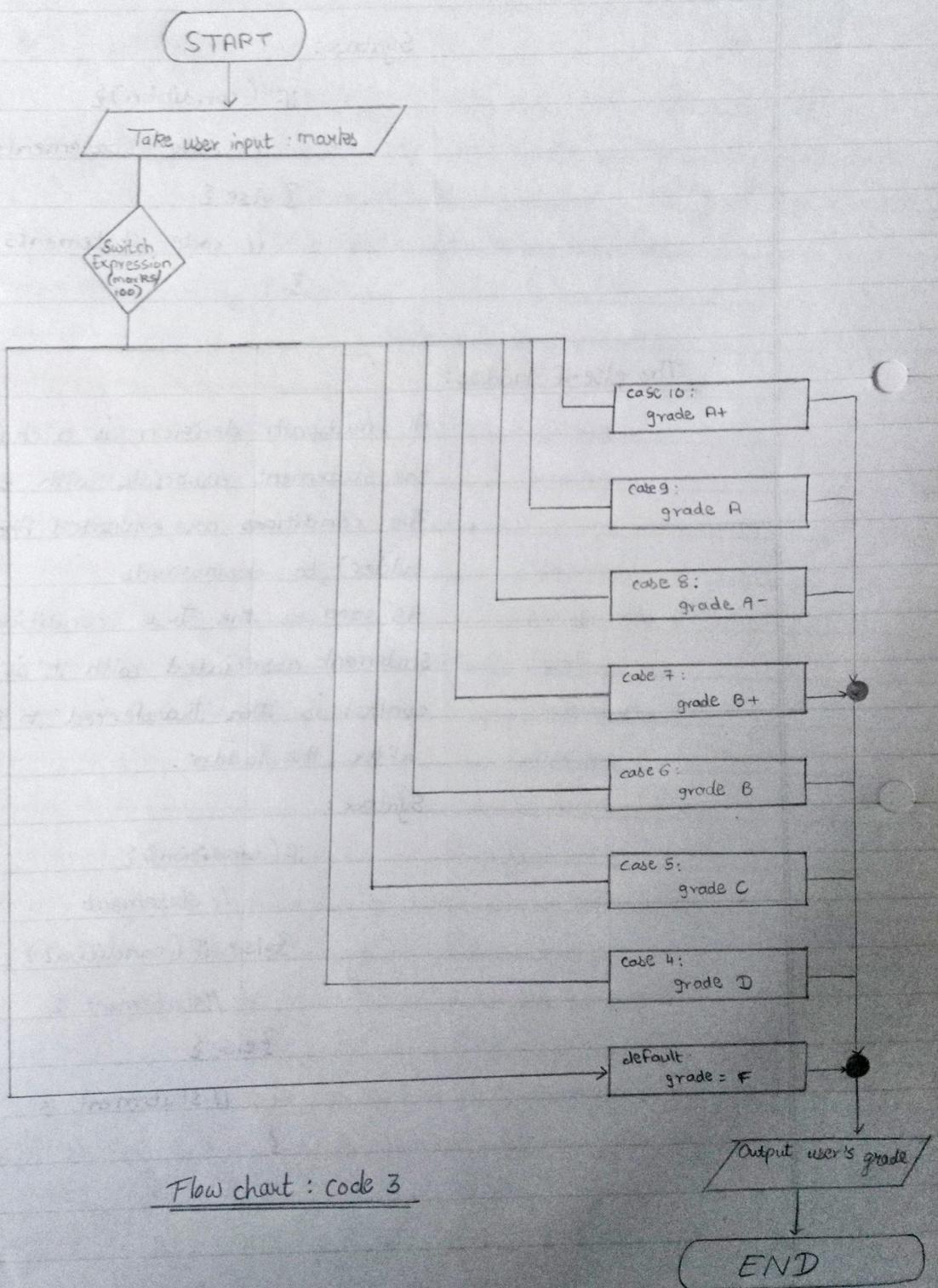
The else-if ladder:

A multipath decision is a chain of ifs in which the statement associate with each else is an if. The conditions are evaluated from the top (of the ladder), to downwards.

As soon as the true condition is found, the statement associated with it is executed and the control is transferred to the statement after the ladder.

Syntax :

```
if (condition){  
    // statement  
} else if (condition2){  
    //statement 2  
} else {  
    // statement 3  
}
```



The switch statement:

The switch statement tests the value of a given variable ,against a list of case values and when a match is found ,a block of statements associated with it is executed.

Syntax:

switch (expression) {

case 1 :

    statement 1;

    break;

case 2 :

    Statement 2;

    break;

default :

    Statement 3;

    break;

}

### Conclusion :

Hence, by performing this practical, I learnt about decision making, and branching. I also created, debugged and executed three java programs on the concepts of if-else, if-else ladder, and switch respectively.

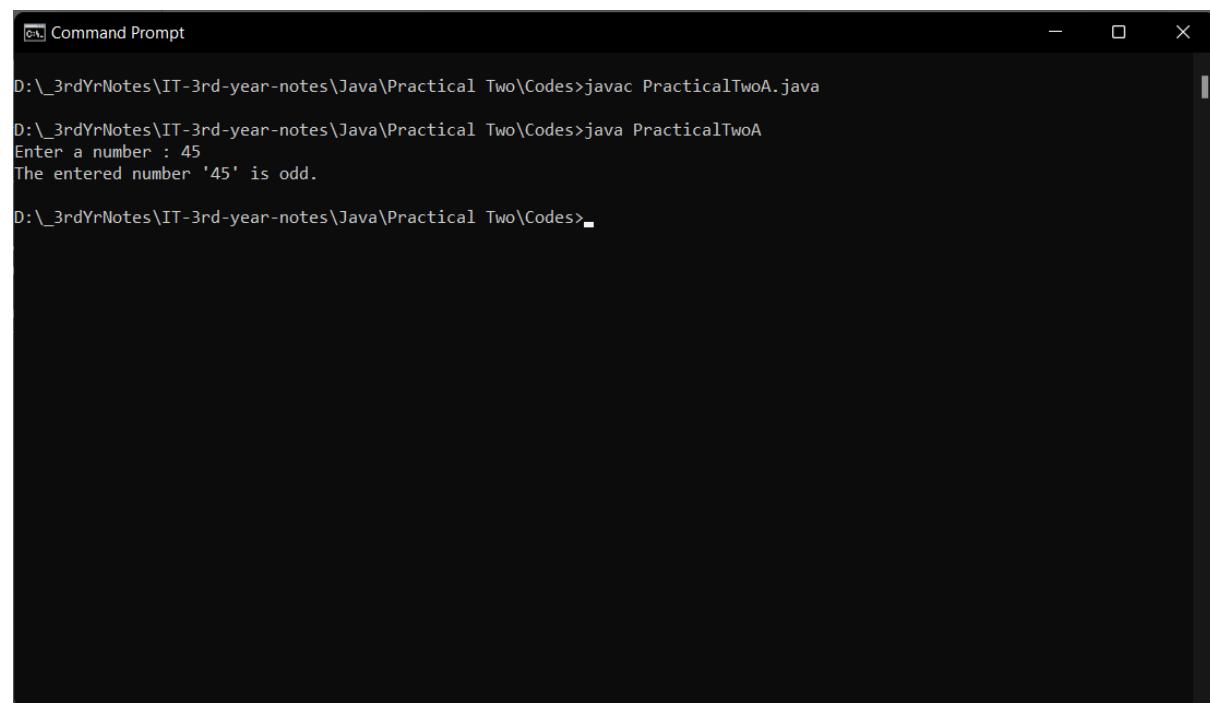
Code :

```
import java.util.Scanner;

class PracticalTwoA{

    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number : ");
        int number = sc.nextInt();
        if(number%2 == 0){
            System.out.println("The entered number '" + number + "' is even.");
        }else{
            System.out.println("The entered number '" + number + "' is odd.");
        }
    }
}
```

Output :



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The path "D:\\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>" is visible at the top. The user has run the command "javac PracticalTwoA.java", followed by "java PracticalTwoA". When prompted to enter a number, the user types "45". The output shows that the program correctly identifies "45" as an odd number.

```
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>javac PracticalTwoA.java
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>java PracticalTwoA
Enter a number : 45
The entered number '45' is odd.

D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>
```

Code :

```
import java.util.Scanner;
import java.util.Random;

class PracticalTwoB{

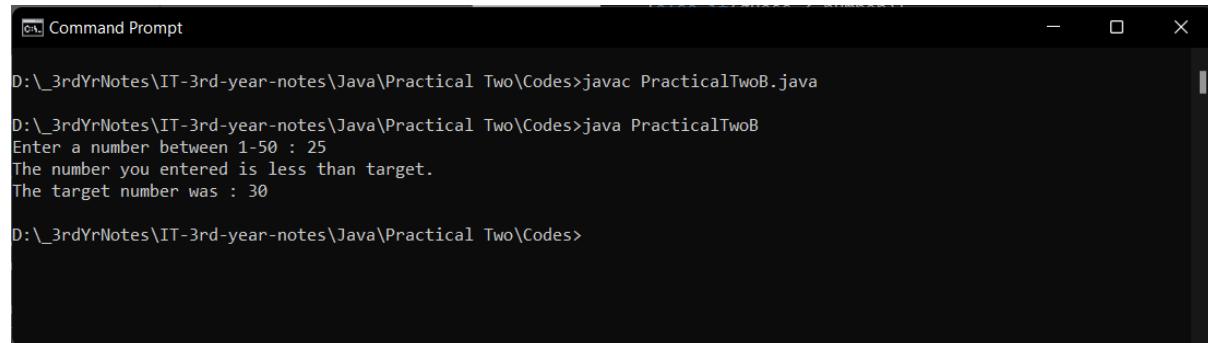
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        Random rand = new Random();
        int number = rand.nextInt(50) + 1;
        int guess;
        if(args.length == 0){
            System.out.print("Enter a number between 1-50 : ");
            guess = sc.nextInt();
        }else{
            guess = Integer.parseInt(args[0]);
        }

        if(guess > number){
            System.out.println("The number you entered is greater than target.");
        }else if(guess < number){
            System.out.println("The number you entered is less than target.");
        }else{
            System.out.println("The number you entered is equal to Target!");
        }

        System.out.println("The target number was : " + number);

    }
}
```

Output:



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The command line shows the path "D:\\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>" followed by the command "javac PracticalTwoB.java". The output of the compilation process is displayed below the command line. Then, the command "java PracticalTwoB" is run, which prompts the user to enter a number between 1-50. The user enters "25". The program then outputs "The number you entered is less than target." and "The target number was : 30".

```
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>javac PracticalTwoB.java
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>java PracticalTwoB
Enter a number between 1-50 : 25
The number you entered is less than target.
The target number was : 30
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>
```

Code :

```
import java.util.Scanner;

class PracticalTwoC{

    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        int marks = 0;
        if(args.length == 0 ){
            System.out.print("Enter marks (Out of 100) : ");
            marks = sc.nextInt();
        }else{
            try{
                marks = Integer.parseInt(args[0]);
            }catch(Exception e){
                marks = 0;
                System.out.println(e.toString());
            }
        }
        String grade;

        switch(marks/10){
            case 10:
                grade = "A+";
                break;
            case 9:
                grade = "A";
                break;
            case 8:
                grade = "A-";
                break;
            case 7:
                grade = "B+";
                break;
            case 6:
                grade = "B";
                break;
            case 5:
                grade = "C";
                break;
            case 4:
                grade = "D";
                break;
            default:
                grade = "F";
                break;
        }
    }
}
```

```
        System.out.println("Your grade with " + marks + " marks is " + grade + ".");  
    }  
}
```

**Output:**



The screenshot shows a Windows Command Prompt window titled 'Select Command Prompt'. The window displays the following text output:

```
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>javac PracticalTwoC.java  
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>java PracticalTwoC  
Enter marks (Out of 100) : 87  
Your grade with 87 marks is A-.  
  
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>java PracticalTwoC  
Enter marks (Out of 100) : 98  
Your grade with 98 marks is A.  
  
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>java PracticalTwoC  
Enter marks (Out of 100) : 33  
Your grade with 33 marks is F.  
  
D:\_3rdYrNotes\IT-3rd-year-notes\Java\Practical Two\Codes>
```

Conclusion:

Hence, by performing this practical, I learnt about decision making and branching. I also created, debugged and executed three java programs on the concepts of if-else, if-else ladder, and switch ~~sp.~~ respectively.