Level 1 Practice Programs

1. **Write a program to take user input for the age of all 10 students in a class and check whether the student can vote depending on his/her age is greater or equal to 18.**

```java
import java.util.Scanner;
public class Vote{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        int[] ages = new int[10];
        //Using for loop and taking input
        for(int i = 0; i < ages.length; i++){
            System.out.print("Enter the age of student " +(i+1)+ " : ");
            ages[i] = input.nextInt();
        }

            //Using for loop and conditional statements
            for(int i = 0; i < ages.length; i++){
                int age = ages[i];
                if(age < 0){
                    System.out.println("Invalid age.");
                }
                else if(age >= 18){
                    System.out.println("Student with the age " +age+ " can vote.");
                }
                else{
                    System.out.println("Student with the age " +age+ " cannot vote.");
                }
            }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac Vote.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java Vote
Enter the age of student 1 : 16
Enter the age of student 2 : 23
Enter the age of student 3 : 22
Enter the age of student 4 : 14
Enter the age of student 5 : 18
Enter the age of student 6 : 19
Enter the age of student 7 : 6
Enter the age of student 8 : -9
Enter the age of student 9 : 15
Enter the age of student 10 : 26
Student with the age 16 cannot vote.
Student with the age 23 can vote.
Student with the age 22 can vote.
Student with the age 14 cannot vote.
Student with the age 18 can vote.
Student with the age 19 can vote.
Student with the age 6 cannot vote.
Invalid age.
Student with the age 15 cannot vote.
Student with the age 26 can vote.
```

2. **Write a program to take user input for 5 numbers and check whether a number is positive, negative, or zero. Further for positive numbers check if the number is even or odd. Finally compare the first and last elements of the array and display if they equal, greater or less.**

```java
import java.util.Scanner;
public class CheckingNumber{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Using arrays to take input
        int[] numbers = new int[5];
        for(int i = 0; i < numbers.length; i++){
            System.out.print("Enter number " +(i+1)+ " : ");
            numbers[i] = input.nextInt();
        }

        //Conditional Statements
        for(int i = 0; i < numbers.length; i++){
            int number = numbers[i];
            if(number > 0){
                System.out.println("The number " +number+ " is a positive number.");
                if (number % 2 == 0){
                    System.out.println("The number " +number+ " is an even number.");
                }else{
                    System.out.println("The number " +number+ " is an odd number.");
                }
            }
            else if(number < 0){
                System.out.println("The number " +number+ " is a negative number.");
            }
            else{
                System.out.println("The number " +number+ " is zero.");
            }
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac CheckingNumber.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java CheckingNumber
Enter number 1 : 9
Enter number 2 : 0
Enter number 3 : 6
Enter number 4 : -7
Enter number 5 : 5
The number 9 is a positive number.
The number 9 is an odd number.
The number 0 is zero.
The number 6 is a positive number.
The number 6 is an even number.
The number -7 is a negative number.
The number 5 is a positive number.
The number 5 is an odd number.
```

3. **Create a program to print a multiplication table of a number.**

```java
import java.util.Scanner;
public class MulTable{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Taking input
        System.out.print("Enter a number : ");
        int n = input.nextInt();

        //Creating an array
        int[] mulTable = new int[10];

        //Calculation
        for(int i = 1; i <= 10; i++){
            mulTable[i-1] = n*i;
        }

        //Printing output
        for(int i = 1; i <= 10; i++){
            System.out.println(n+ " x " +i+ " = " +mulTable[i-1]);
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac MulTable.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java MulTable
Enter a number : 7
7 x 1 = 7
7 x 2 = 14
7 x 3 = 21
7 x 4 = 28
7 x 5 = 35
7 x 6 = 42
7 x 7 = 49
7 x 8 = 56
7 x 9 = 63
7 x 10 = 70
```

4. **Write a program to store multiple values in an array up to a maximum of 10 or until the user enters a 0 or a negative number. Show all the numbers as well as the sum of all numbers.**

```java
import java.util.Scanner;
public class SumOfNum{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Declaring variables
        double[] num = new double[10];
        double total = 0.0;
        int index = 0;

        //Using while loop
        while (true){
            System.out.print("Enter a number : ");
            double x = input.nextDouble();

            //Using conditional statement
            if(x <= 0 || x == 10){
                break;
            }

            num[index] = x;
            index++;
        }

        //Using for loop and printing output
        System.out.println("You entered the following number : ");
        for (int i = 0; i < index; i++){
            System.out.println(num[i]);
            total += num[i];
        }
        System.out.println("The total sum : " +total);
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac SumOfNum.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java SumOfNum
Enter a number : 9
Enter a number : 5
Enter a number : 7
Enter a number : 3
Enter a number : 78
Enter a number : 45
Enter a number : 10
You entered the following number :
9.0
5.0
7.0
3.0
78.0
45.0
The total sum : 147.0
```

5. **Create a program to find the multiplication table of a number entered by the user from 6 to 9 and display the result.**

```java
import java.util.Scanner;
public class MulTable6To9{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Taking user input and storing it in an array
        System.out.print("Enter a number : ");
        int n = input.nextInt();
        int[] mul_res = new int[4];

        //Using for loop and printing output
        for(int i = 6; i <= 9; i++){
            mul_res[i-6] = n*i;
            System.out.println(n+ " * " +i+ " = " +mul_res[i-6]);
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac MulTable6To9.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java MulTable6To9
Enter a number : 7
7 * 6 = 42
7 * 7 = 49
7 * 8 = 56
7 * 9 = 63
```

6. **Create a program to find the mean height of players present in a football team.**

```java
import java.util.Scanner;
public class Height{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Delcaring an array
        double[] height = new double[11];
        double sum = 0;

        //Taking user input and using for loop
        for(int i = 0; i < 11; i++){
            System.out.print("Enter height of player " +(i+1)+ " : ");
            height[i] = input.nextDouble();
            sum += height[i];
        }

        //Printing output
        double mean_height = sum/11;
        System.out.println("The mean height of the team is : " +mean_height);
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac Height.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java Height
Enter height of player 1 : 45
Enter height of player 2 : 63
Enter height of player 3 : 12
Enter height of player 4 : 37
Enter height of player 5 : 16
Enter height of player 6 : 79
Enter height of player 7 : 52
Enter height of player 8 : 64
Enter height of player 9 : 18
Enter height of player 10 : 42
Enter height of player 11 : 60
The mean height of the team is : 44.36363636363637
```

7. **Create a program to save odd and even numbers into odd and even arrays between 1 to the number entered by the user. Finally, print the odd and even numbers array.**

```java
import java.util.Scanner;
public class OnE{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Taking user input
        System.out.print("Enter a number : ");
        int n = input.nextInt();

        //Conditional Statements
        if(n < 1){
            System.out.println("Enter a natural number.");
            return;
        }

        //Declaring arrays
        int even = n/2;
        int odd = (n+1)/2;
        int[] evenN = new int[even];
        int[] oddN = new int[odd];
        int evenIndex = 0, oddIndex = 0;

        //Using for loop
        for(int i = 1; i <= n; i++){
            if(i%2==0){
                evenN[evenIndex++] = i;
            } else{
                oddN[oddIndex++] = i;
            }
        }

        //Printing output
        System.out.print("Even numbers : ");
        for(int i = 0; i<evenIndex; i++){
            System.out.print(evenN[i] + " ");
        }
        System.out.println();
        System.out.print("Odd numbers : ");
        for(int i = 0; i<oddIndex; i++){
            System.out.print(oddN[i] + " ");
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac OnE.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java OnE
Enter a number : 30
Even numbers : 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Odd numbers : 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29
```

8. **Create a program to find the factors of a number taken as user input, store the factors in an array, and display the factors.**

```java
import java.util.Scanner;
public class Factors{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Taking user input
        System.out.print("Enter a number : ");
        int n = input.nextInt();

        //Declaring an array
        int[] factors = new int[n];
        int index = 0;

        //Using for loop
        for(int i = 1; i <= n; i++){
            if(n % i ==0){
                factors[index++] = i;
            }
        }

        //Printing output
        System.out.println("Factors of " +n+ " are : ");
        for(int i = 0; i < index; i++){
            System.out.println(factors[i]);
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac Factors.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java Factors
Enter a number : 36
Factors of 36 are :
1
2
3
4
6
9
12
18
```

9. **Working with Multi-Dimensional Arrays. Write a Java program to create a 2D Array and Copy the 2D Array into a single dimension array.**

```java
import java.util.Scanner;
public class MDA{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Taking user input
        System.out.print("Enter the number of rows : ");
        int r = input.nextInt();
        System.out.print("Enter the number of columns : ");
        int c = input.nextInt();

        //Declaring array
        int[][] matrix = new int[r][c];
        int[] array = new int[r*c];
        int index = 0;

        //Taking input of the elements and performing the multi dimensional arrays
        System.out.println("Enter the matrix elements : ");
        for(int i = 0; i < r; i++){
            for(int j = 0; j < c; j++){
                matrix[i][j] = input.nextInt();
                array[index++] = matrix[i][j];
            }
        }

        //Printing output
        System.out.println("1D Array : ");
        for(int n : array){
            System.out.print(n+ " ");
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac MDA.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java MDA
Enter the number of rows : 3
Enter the number of columns : 2
Enter the matrix elements :
5
4
8
6
1
2
1D Array :
5 4 8 6 1 2
```

10. **Write a program FizzBuzz, take a number as user input and if it is a positive integer loop from 0 to the number and save the number, but for multiples of 3 save "Fizz" instead of the number, for multiples of 5 save "Buzz", and for multiples of both save "FizzBuzz". Finally, print the array results for each index position in the format Position 1 = 1, …, Position 3 = Fizz,...**

```java
import java.util.Scanner;
public class FizzBuzz{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        //Taking user input
        System.out.print("Enter a positive number : ");
        int n = input.nextInt();

        //Conditional Statement
        if(n <= 0){
            System.out.println("Enter a positive number.");
            return;
        }

        //Declaring String array
        String[] result = new String[n+1];

        //Using for loop
        for(int i = 0; i <= n; i++){
            if(i%3==0 && i%5==0){
                result[i] = "FizzBuzz";
            }
            else if(i%3 == 0){
                result[i] = "Fizz";
            }
            else if(i%5 == 0){
                result[i] = "Buzz";
            }
            else{
                result[i] = String.valueOf(i);
            }
        }

        //Printing output
        for(int i = 0; i < n; i++){
            System.out.println("Position " +i+ " = " +result[i]);
        }
    }
}
```

```
C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>javac FizzBuzz.java

C:\Users\Shounak Roy\Desktop\JAVA\Topic 3- Arrays\Level 1>java FizzBuzz
Enter a positive number : 20
Position 0 = FizzBuzz
Position 1 = 1
Position 2 = 2
Position 3 = Fizz
Position 4 = 4
Position 5 = Buzz
Position 6 = Fizz
Position 7 = 7
Position 8 = 8
Position 9 = Fizz
Position 10 = Buzz
Position 11 = 11
Position 12 = Fizz
Position 13 = 13
Position 14 = 14
Position 15 = FizzBuzz
Position 16 = 16
Position 17 = 17
Position 18 = Fizz
Position 19 = 19
```