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.**

Hint =>

a. Define an array of 10 integer elements and take user input for the student's age.

a. Loop through the array using the length property and for the element of the array check If the age is a negative number print an invalid age and if 18 or above, print The student with the age ___ can vote. Otherwise, print The student with the age ___ cannot vote.

```
import java.util.Scanner;

public class votearray {

public static void main(String[] args) {

int[] ages = new int[10];

Scanner myObj = new Scanner(System.in);


System.out.println("Enter the ages of 10 students:");

for (int i = 0; i < ages.length; i++) {

ages[i] = myObj.nextInt();

}


for (int i = 0; i < ages.length; i++) {

if (ages[i] < 0) {

System.out.println("Invalid age");

} else if (ages[i] >= 18) {

System.out.println("The student with the age " + ages[i] + " can vote.");

} else {

System.out.println("The student with the age " + ages[i] + " cannot vote.");

}
```

```
}
}
}
```

1. 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

Hint =>

a. Define an integer array of 5 elements and get user input to store in the array.

a. Loop through the array using the length If the number is positive, check for even or odd numbers and print accordingly

a. If the number is negative, print negative. Else if the number is zero, print zero.

a. Finally compare the first and last element of the array and display if they equal, greater or less

```
import java.util.Scanner;

public class posnegzeroarray {
public static void main(String[] args) {
int[] numbers = new int[5];
Scanner scanner = new Scanner(System.in);

System.out.println("Enter 5 numbers:");

for (int i = 0; i < numbers.length; i++) {
System.out.print("Number " + (i + 1) + ": ");
```

```
numbers[i] = scanner.nextInt();
}

for (int num : numbers) {
if (num > 0) {
if (num % 2 == 0) {
System.out.println(num + " is positive and even.");
} else {
System.out.println(num + " is positive and odd.");
}
} else if (num < 0) {
System.out.println(num + " is negative.");
} else {
System.out.println(num + " is zero.");
}
}

if (numbers[0] > numbers[4]) {
System.out.println("First element is greater than the last element.");
} else if (numbers[0] < numbers[4]) {
System.out.println("First element is less than the last element.");
} else {
System.out.println("First and last elements are equal.");
}

scanner.close();
}
}
```

1. Create a program to print a multiplication table of a number.

Hint =>

a. Get an integer input and store it in the number variable. Also, define a integer array to store the results of multiplication from 1 to 1

a. Run a loop from 1 to 10 and store the results in the multiplication table array

a. Finally, display the result from the array in the format number * i = ___

```
import java.util.Scanner;

public class multitablearray {
public static void main(String[] args) {
int number;
int[] table = new int[10];
Scanner scanner = new Scanner(System.in);

System.out.print("Enter a number: ");
number = scanner.nextInt();

for (int i = 0; i < 10; i++) {
table[i] = number * (i + 1);
}

for (int i = 0; i < 10; i++) {
System.out.println(number + " * " + (i + 1) + " = " + table[i]);
}

scanner.close();
```

```
}
}
```

1. 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

Hint =>

a. Create a variable to store an array of 10 elements of type double as well as a variable to store the total of type double initializes to 0.0. Also, the index variable is initialized to 0 for the array

a. Use infinite while loop as in *while (true)*

a. Take the user entry and check if the user entered 0 or a negative number to break the loop

a. Also, *break* from the loop if the index has a value of 10 as the array size is limited to 10.

a. If the user entered a number other than 0 or a negative number inside the while loop then assign the number to the array element and increment the index value

a. Take another *for* loop to get the values of each element and add it to the total

a. Finally display the total value

```
import java.util.Scanner;


public class arraysum {
public static void main(String[] args) {
double[] numbers = new double[10];
double total = 0.0;
int index = 0;
Scanner scanner = new Scanner(System.in);
```

```
System.out.println("Enter numbers (up to 10). Enter 0 or a negative number to
stop:");

while (true) {
System.out.print("Enter number: ");
double num = scanner.nextDouble();

if (num <= 0 || index == 10) {
break;
}

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

System.out.println("\nNumbers entered:");
for (int i = 0; i < index; i++) {
System.out.print(numbers[i] + " ");
total += numbers[i];
}

System.out.println("\nTotal sum: " + total);

scanner.close();
}
}
```

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

Hint =>

a. Take integer input and store it in the variable number as well as define an integer array to store the multiplication result in the variable multiplicationResult

a. Using a for loop, find the multiplication table of numbers from 6 to 9 and save the result in the array

a. Finally, display the result from the array in the format number * i = ___

```
import java.util.Scanner;


public class multiarray69 {
public static void main(String[] args) {
int number;
int[] multiplicationResult = new int[4];
Scanner scanner = new Scanner(System.in);

System.out.print("Enter a number: ");
number = scanner.nextInt();

for (int i = 0; i < 4; i++) {
multiplicationResult[i] = number * (i + 6);
}

for (int i = 0; i < 4; i++) {
System.out.println(number + " * " + (i + 6) + " = " + multiplicationResult[i]);
}
```

```
scanner.close();
}
}
```

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

Hint =>

a. The formula to calculate the mean is: mean = sum of all elements / number of elements

a. Create a double array named heights of size 11 and get input values from the user.

a. Find the sum of all the elements present in the array.

a. Divide the sum by 11 to find the mean height and print the mean height of the football team

```
import java.util.Scanner;

public class meanheightarray {
public static void main(String[] args) {
double[] heights = new double[11];
double sum = 0.0;
Scanner scanner = new Scanner(System.in);

System.out.println("Enter the heights of 11 football players:");

for (int i = 0; i < 11; i++) {
System.out.print("Player " + (i + 1) + " height: ");
```

```
heights[i] = scanner.nextDouble();
sum += heights[i];
}

double mean = sum / 11;

System.out.println("\nThe mean height of the football team is: " + mean);

scanner.close();
}
}
```

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**

Hint =>

a. Get an integer input from the user, assign it to a variable *number,* and check for Natural Number. If not a natural number then print an error and exit the program

a. Create an integer array for even and odd numbers with size = number / 2 + 1

a. Create index variables for odd and even numbers and initialize them to zero

a. Using a for loop, iterate from 1 to the number, and in each iteration of the loop, save the odd or even number into the corresponding array

a. Finally, print the odd and even numbers array using the odd and even index

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

```
public class oddevenarray {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);

System.out.print("Enter a natural number: ");
int number = scanner.nextInt();

if (number <= 0) {
System.out.println("Error: Please enter a natural number (greater than 0).");
return;
        }

int[] evenNumbers = new int[number / 2 + 1];
int[] oddNumbers = new int[number / 2 + 1];
int evenIndex = 0, oddIndex = 0;

for (int i = 1; i <= number; i++) {
if (i % 2 == 0) {
evenNumbers[evenIndex++] = i;
} else {
oddNumbers[oddIndex++] = i;
}
}

System.out.print("Even numbers: ");
for (int i = 0; i < evenIndex; i++) {
System.out.print(evenNumbers[i] + " ");
}
```

```
System.out.print("\nOdd numbers: ");
for (int i = 0; i < oddIndex; i++) {
System.out.print(oddNumbers[i] + " ");
}

scanner.close();
}
}
```

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**

Hint =>

a. Take the input for a number

b. **Find the factors of the number and save them in an array. For this create integer variable maxFactor and initialize to 10, factors array of size maxFactor and index variable to reflect the index of the array.**

b. **To find factors loop through the numbers from 1 to the number, find the factors, and add them to the array element by incrementing the index. If the index is equal to maxIndex, then need factors array to store more elements**

b. **To store more elements, reset the maxIndex to twice its size, use the temp array to store the elements from the factors array, and eventually assign the factors array to the temp array**

b. **Finally, Display the factors of the number**

```
import java.util.Scanner;

public class factorsarray {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);
```

```
System.out.print("Enter a number: ");
int number = scanner.nextInt();

int maxFactor = 10;
int[] factors = new int[maxFactor];
int index = 0;

for (int i = 1; i <= number; i++) {
if (number % i == 0) {
if (index == maxFactor) {
maxFactor *= 2;
int[] temp = new int[maxFactor];
System.arraycopy(factors, 0, temp, 0, factors.length);
factors = temp;
}
factors[index++] = i;
}
}

System.out.print("Factors of " + number + ": ");
for (int i = 0; i < index; i++) {
System.out.print(factors[i] + " ");
}

scanner.close();
}
}
```

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**

Hint =>

a. Take user input for rows and columns, create a 2D array (Matrix), and take the user input

a. Copy the elements of the matrix to a 1D array. For this create a 1D array of size rows*columns as in int[] array = new int[rows * columns];

a. Define the index variable and Loop through the 2D array. Copy every element of the 2D array into the 1D array and increment the index

a. Note: For looping through the 2D array, you will need Nested for loop, Outer for loop for rows, and the inner for loops to access each element

```
import java.util.Scanner;


public class matrixtoarray {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);


System.out.print("Enter the number of rows: ");
int rows = scanner.nextInt();


System.out.print("Enter the number of columns: ");
int columns = scanner.nextInt();


int[][] matrix = new int[rows][columns];
int[] array = new int[rows * columns];


System.out.println("Enter the elements of the matrix:");
for (int i = 0; i < rows; i++) {
for (int j = 0; j < columns; j++) {
System.out.print("Element [" + i + "][" + j + "]: ");
```

```
matrix[i][j] = scanner.nextInt();
}
}

int index = 0;
for (int i = 0; i < rows; i++) {
for (int j = 0; j < columns; j++) {
array[index++] = matrix[i][j];
}
}

System.out.println("\n1D Array after copying elements:");
for (int num : array) {
System.out.print(num + " ");
}

scanner.close();
}
}
```

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,...**

Hint =>

a. Create a String Array to save the results and

a. Finally, loop again to show the results of the array based on the index position

```
import java.util.Scanner;

public class fizzbuzzarray {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);

System.out.print("Enter a positive integer: ");
int number = scanner.nextInt();

if (number <= 0) {
System.out.println("Error: Please enter a positive integer.");
return;
}

String[] results = new String[number + 1];

for (int i = 0; i <= number; i++) {
if (i % 3 == 0 && i % 5 == 0) {
results[i] = "FizzBuzz";
} else if (i % 3 == 0) {
results[i] = "Fizz";
} else if (i % 5 == 0) {
results[i] = "Buzz";
} else {
results[i] = String.valueOf(i);
}
}

for (int i = 0; i <= number; i++) {
```

```
System.out.println("Position " + i + " = " + results[i]);
}

scanner.close();
}
}
```