

Java Assignment -1

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codes link:- [Assignment link](#)

1. Program to add two numbers

```
import java.util.*;
public class AddTwoNum {
    public static void main(String[] args){
        int x,y;
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter first number:");
        x=sc.nextInt();
        System.out.print("Enter second number:");
        y=sc.nextInt();
        int sum=x+y;
        System.out.println("Sum of "+x+" and "+y+" is "+ sum);
        sc.close();
    }
}

//Output:-
// Enter first number:10
// Enter second number:20
// Sum of 10 and 20 is 30
```

2. Program to perform basic arithmetic operations

```
import java.util.*;

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

        try {
            int choice;
            do {
                System.out.print("Please Enter:\n1 For addition\n2 For subtraction\n3 For multiplication\n4 For division\n");
                choice = sc.nextInt();
            } while (choice < 1 || choice > 4);

            System.out.print("Enter first number :");
            int a = sc.nextInt();

            System.out.print("Enter second number:");
            int b = sc.nextInt();

            double result = -1;
            boolean isError = false;

            switch (choice) {
                case 1: {
                    result = a + b;
                    break;
                }
                case 2: {
                    result = a - b;
                    break;
                }
                case 3: {
                    result = a * b;
                    break;
                }
            }
        }
    }
}
```

```

        case 4: {
            if (b == 0) {
                System.out.println("Can't divide a number by zero!");
                isError = true;
            } else {
                result = (double) a / b;
            }
            break;
        }
        default:
            System.out.println("Unexpected error occurred!");
            isError = true;
            break;
    }

    if (!isError) {
        System.out.println("Result is " + result);
    }
} catch (InputMismatchException e) {
    System.out.println("Invalid input. Please enter valid integers.");
} finally {
    sc.close();
}
}

// Please Enter:
// 1 For addition
// 2 For subtraction
// 3 For multiplication
// 4 For division
// 4
// Enter first number :10
// Enter second number:0
// Can't divide a number by zero!

```

3. Program to perform binary search

```

import java.util.*;
public class Binary_Search{
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        int n;
        System.out.print("Enter size of array:");
        n=sc.nextInt();
        int arr[]=new int[n];
        System.out.println("Enter elements into array:");
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int item;
        System.out.print("Enter the search element:");
        item=sc.nextInt();
        int ans=-1;
        int beg=0,end=arr.length-1;
        while(beg<=end){
            int mid=(beg)+(end-beg)/2;
            if(arr[mid]==item){
                ans=mid;
                break;
            }else if(arr[mid]>item){
                end=mid-1;
            }else{
                beg=mid+1;
            }
        }
        if(ans>0){
            System.out.println("We found "+item+" in the array at position "+ ans);
        }else{
            System.out.println("Sorry! we can't find "+ item +" in array!");
        }
    }
}

// Enter size of array:10

```

```
// Enter elements into array:
// 1
// 2
// 3
// 4
// 5
// 6
// 7
// 8
// 9
// 10
// Enter the search element:6
// We found 6 in the array at position 5
```

4. Program to perform bubble sort

```
import java.util.*;
public class BubbleSort {
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter size of array:");
        int n=sc.nextInt();
        int arr[]=new int[n];
        System.out.println("Enter "+n+" elements into array:");
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        for(int i=0;i<arr.length-1;i++){
            for(int j=0;j<arr.length-i-1;j++){
                if(arr[j]>arr[j+1]){
                    int temp=arr[j];
                    arr[j]=arr[j+1];
                    arr[j+1]=temp;
                }
            }
        }
        System.out.println("The bubble sorted elements are as follows:");
        for(int i=0;i<arr.length;i++){
            System.out.print(arr[i]+" ");
        }
        sc.close();
    }
}

// OUTPUT-----
// Enter size of array:
// 10
// Enter 10 elements into array:
// 1
// 2
// 3
// 11
// 66
// -10
// 8
// 3
// 2
// 1
// The bubble sorted elements are as follows:
// -10 1 1 2 2 3 3 8 11 66
```

5. Program to implement fibanacci series

```
import java.util.*;
public class FibbanociSeries {
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter 'n' value:");
        int n=sc.nextInt();
        int n1=0;
        int n2=1;
```

```

        System.out.println("Fibbanoci Series are as follows:");
        while(n>=0){
            System.out.print(n1+" ");
            int temp=n1+n2;
            n1=n2;
            n2=temp;
            n--;
        }
        sc.close();
    }
}

//OUTPUT

// Enter 'n' value:10
// Fibbanoci Series are as follows:
// 0 1 1 2 3 5 8 13 21 34 55

```

6. Program to implement function overloading

```

class Say{
    public void disp(String name){
        System.out.println("Hello "+name+"!");
    }
    public void disp(int age){
        System.out.println("Your age is "+age);
    }
    public void disp(String name,int age){
        System.out.println("Hi "+name+" your age is "+ age);
    }
}

public class FunctionOverloading {
    public static void main(String[] args) {
        Say s1=new Say();
        s1.disp("Manoj");
        s1.disp(19);
        s1.disp("Manoj",19);
    }
}

// Hello Manoj!
// Your age is 19
// Hi Manoj your age is 19

```

7. Program to implement classes and objects

```

import java.util.Scanner;

class Squad {
    private String name;
    private String id;
    private String[] techStack;

    Squad(String name, String id, String[] techStack) {
        this.name = name;
        this.id = id;
        this.techStack = techStack;
    }

    public void display() {
        System.out.println("=====");
        System.out.println("  Developer's Profile");
        System.out.println("-----");
        System.out.println("ID:    " + this.id);
        System.out.println("Name:  " + this.name);
        System.out.println("-----");
        System.out.println("Tech Stack:");

        for (String tech : techStack) {
            System.out.println("  - " + tech);
        }
    }
}

```

```

    }

    System.out.println("=====");
}

}

public class InDisp {
    public static void main(String[] args) {
        Squad s1 = input();
        s1.display();
    }

    public static Squad input() {
        try (Scanner sc = new Scanner(System.in)) {
            System.out.println("=== Developer Information ===");

            System.out.print("Enter name: ");
            String name = sc.nextLine();

            System.out.print("Enter ID: ");
            String id = sc.nextLine();

            int n;
            do {
                System.out.print("Enter the number of technologies in your Tech Stack: ");
                while (!sc.hasNextInt()) {
                    System.out.println("Invalid input. Please enter a valid number.");
                    sc.next();
                }
                n = sc.nextInt();
                sc.nextLine();
            } while (n < 0);

            System.out.println("Enter the technologies in your Tech Stack:");
            String[] techStack = new String[n];
            for (int i = 0; i < n; i++) {
                System.out.print("Tech " + (i + 1) + ": ");
                techStack[i] = sc.nextLine();
            }

            return new Squad(name, id, techStack);
        }
    }
}

// === Developer Information ===
// Enter name: Manoj
// Enter ID: EXEG6
// Enter the number of technologies in your Tech Stack: 5
// Enter the technologies in your Tech Stack:
// Tech 1: Java
// Tech 2: C++
// Tech 3: Python
// Tech 4: Machine Learning
// Tech 5: Node js
// =====
//      Developer's Profile
// -----
// ID:   EXEG6
// Name: Manoj
// -----
// Tech Stack:
//   - Java
//   - C++
//   - Python
//   - Machine Learning
//   - Node js
// =====

```

8. Program to perform linear search

```

import java.util.*;
public class linear_search {

```

```

public static void main(String[] args){
    Scanner sc=new Scanner(System.in);
    System.out.print("Enter size :");
    int n=sc.nextInt();
    int arr[]=new int[n];
    System.out.println("Enter "+n+" elements into array:");
    for(int i=0;i<n;i++){
        arr[i]=sc.nextInt();
    }
    System.out.println("Enter the search element:");
    int ele=sc.nextInt();
    int found=0;
    int pos=-1;
    for(int i=0;i<n;i++){
        if(ele==arr[i]){
            found=1;
            pos=i;
            break;
        }else{
            found=0;
        }
    }
    if(found==1){
        System.out.println(ele+" found at index "+ pos);
    }else{
        System.out.println("Sorry! We can't find "+ele+" in the given array!!");
    }
    sc.close();
}
}

//OUTPUT-----
// Enter size :5 {case 1}
// Enter 5 elements into array:
// 1
// 2
// 3
// 4
// 5
// Enter the search element:
// 3
// 3 found at index 2
//-----
// Enter size :5 {case 2}
// Enter 5 elements into array:
// 1
// 2
// 3
// 4
// 5
// Enter the search element:
// 6
// Sorry! We can't find 6 in the given array!!

```

9. Program to get max of 3 numbers using command line arguments

```

public class Max3CLA {
    public static void main(String[] args){
        int num1=Integer.parseInt(args[0]);
        int num2=Integer.parseInt(args[1]);
        int num3=Integer.parseInt(args[2]);

        int largest=num1;
        if(num2>largest){
            largest=num2;
        }
        if(num3>largest){
            largest=num3;
        }
        System.out.println("Largest number is "+largest);
    }
}

// javac Max3CLA.java

```

```
// java Max3CLA 30 10 20
// Largest number is 30
```

10. Program to check whether a string is palindrome or not

```
public class PalindromeString {
    public static void main(String[] args){
        String word="Java";
        String revWord="";
        for(int i=0;i<word.length();i++){
            char temp=word.charAt(i);
            revWord=temp+revWord;
        }
        System.out.println("Original word :"+word);
        System.out.println("Revered word :"+revWord);
        int yes=1;
        for(int i=0;i<word.length();i++){
            if(word.charAt(i)!=revWord.charAt(i)){
                yes=0;
                break;
            }
        }
        if(yes==1){
            System.out.println("Palindrome!");
        }else{
            System.out.println("Not palindrome!");
        }
    }
}

// output
// Original word :repaper
// Revered word :repaper
// Palindrome!

//output
// Original word :Java
// Revered word :avaJ
// Not palindrome!
```

11. Program to find square root of a number

```
import java.util.*;
public class PrimeCheck {
    public static void check(int number){
        int flag=1;
        for(int i=2;i<=Math.sqrt(number);i++){
            if(number%i==0){
                flag=0;
                break;
            }
        }
        if(flag==0){
            System.out.println(number +" is not a prime number!");
        }else{
            System.out.println(number + " is a prime number!");
        }
    }
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter number:");
        int number=sc.nextInt();
        check(number);
    }
}

// Enter number:21
// 21 is not a prime number!
```

```
// Enter number:73
// 73 is a prime number!
```

12. Program to reverse an array

```
import java.util.*;
public class reverseArray {
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        int[] arr={10,20,30,40,50};
        System.out.println("Original array:");
        for(int i=0;i<arr.length;i++){
            System.out.print(arr[i]+" ");
        }
        int beg=0,end=arr.length-1;
        while(beg<end){
            int temp=arr[beg];
            arr[beg]=arr[end];
            arr[end]=temp;
            beg++;
            end--;
        }
        System.out.println();
        System.out.println("Reversed array:");
        for(int i=0;i<arr.length;i++){
            System.out.print(arr[i]+" ");
        }
        sc.close();
    }
}

// OUTPUT-----
// Original array:
// 10 20 30 40 50
// Reversed array:
// 50 40 30 20 10
```

13. Program to reverse an integer

```
public class ReverseInteger {
    public static void main(String[] args){
        int number=123456;
        int reversedNumber=0;
        System.out.println("Original number is "+number);
        while(number>0){
            int lastDigit=number%10;
            reversedNumber=reversedNumber*10+lastDigit;
            number/=10;
        }
        System.out.println("Reved number is "+reversedNumber);
    }
}

//OUTPUT
// Original number is 123456
// Reved number is 654321
```

14. Program to reverse a string

```
public class ReverseString {
    public static void main(String[] args){
        String word="Monkey";
        String revWord="";
        for(int i=0;i<word.length();i++){
            char temp=word.charAt(i);
            revWord=temp+revWord;
        }
        System.out.println("Original word :"+word);
    }
}
```



```

        System.out.println("Revered word :"+revWord);
    }
}

//OUTPUT
// Original word :Monkey
// Revered word :yeknoM

```

15. Program to implement selection sort

```

import java.util.*;
public class SelectionSort {
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter size of array:");
        int n=sc.nextInt();
        System.out.println("Enter "+n+" elements into array:");
        int arr[]=new int[n];
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        for(int i=0;i<n;i++){
            int ele=arr[0];
            for(int j=i+1;j<n;j++){
                if(arr[i]>arr[j]){
                    int temp=arr[i];
                    arr[i]=arr[j];
                    arr[j]=temp;
                }
            }
        }
        System.out.println("Selection sorted elements are as follows:");
        for(int i=0;i<arr.length;i++){
            System.out.print(arr[i]+" ");
        }
    }
}

//OUTPUT
// Enter size of array:10
// Enter 10 elements into array:
// 100
// -1
// 20
// -3
// 40
// 1000
// 4
// -12
// -333
// 577
// Selection sorted elements are as follows:
// -333 -12 -3 -1 4 20 40 100 577 1000

```

16. Program to implement default and parameterized constructor

```

class A{
    public int l;
    public int b;
    public int h;
    public A(){ //default
        this.l=-1;
        this.b=-1;
        this.h=-1;
    }
    public A(A ob){ // copy constructor
        this.l=ob.l;
        this.b=ob.b;
        this.h=ob.h;
    }
}

```

```

    public A(int l,int b,int h){ // parameterized
        this.l=l;
        this.b=b;
        this.h=h;
    }
}
class CreateBox extends A{
    public CreateBox(int l,int b,int h){
        super(l, b, h);
    }
    public CreateBox(A ob){
        super(ob);
    }
    public CreateBox(){
        super();
    }
    public void displayVolume(){
        int vol=this.l*this.b*this.h;
        System.out.println("Volume is "+vol);
    }
}
public class DemoBox {
    public static void main(String[] args){
        //method 1 of creating
        CreateBox ob=new CreateBox(10,20,30);
        ob.displayVolume();
        //method 2 of creating
        CreateBox ob1 =new CreateBox(ob);
        ob1.displayVolume();
        // //method 3 of creating
        CreateBox ob2 =new CreateBox();
        ob2.displayVolume();
    }
}

//output
//Volume is 6000
//Volume is 6000
//Volume is -1

```

17. Program to implement nested switch statements

```

import java.util.Scanner;

public class TextRPG {

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

        System.out.println("Welcome to  RPG Adventure!");
        System.out.println("Choose your character class:");
        System.out.println("1. Warrior");
        System.out.println("2. Mage");
        System.out.println("3. Rogue");

        int characterChoice = scanner.nextInt();

        switch (characterChoice) {
            case 1:
                System.out.println("You are a mighty Warrior! Prepare for battle!");
                handleWarriorActions(scanner);
                break;
            case 2:
                System.out.println("You are a powerful Mage! Get ready to cast spells!");
                handleMageActions(scanner);
                break;
            case 3:
                System.out.println("You are a cunning Rogue! Sneak and strike!");
                handleRogueActions(scanner);
                break;
            default:
                System.out.println("Invalid choice. Exiting the game.");
                break;
        }
    }
}

```

```

        scanner.close();
    }

    private static void handleWarriorActions(Scanner scanner) {
        System.out.println("Choose your action as a Warrior:");
        System.out.println("1. Attack");
        System.out.println("2. Defend");

        int warriorAction = scanner.nextInt();

        switch (warriorAction) {
            case 1:
                System.out.println("You swing your mighty sword and deal damage!");
                break;
            case 2:
                System.out.println("You raise your shield and prepare for the enemy's attack.");
                System.out.println("Choose your defensive move:");
                System.out.println("a. Block");
                System.out.println("b. Counter");

                char warriorDefensiveMove = scanner.next().charAt(0);

                switch (warriorDefensiveMove) {
                    case 'a':
                        System.out.println("You successfully block the enemy's attack!");
                        break;
                    case 'b':
                        System.out.println("You counter the enemy's attack with a powerful strike!");
                        break;
                    default:
                        System.out.println("Invalid defensive move. The enemy seizes the opportunity!");
                        break;
                }
                break;
            default:
                System.out.println("Invalid action. The enemy seizes the opportunity!");
                break;
        }
    }

    private static void handleMageActions(Scanner scanner) {
        System.out.println("Choose your spell as a Mage:");
        System.out.println("1. Fireball");
        System.out.println("2. Ice Blast");

        int mageSpell = scanner.nextInt();

        switch (mageSpell) {
            case 1:
                System.out.println("You unleash a fiery fireball! Burn, enemy, burn!");
                break;
            case 2:
                System.out.println("You cast a freezing Ice Blast, slowing down the enemy.");
                System.out.println("Choose additional effect:");
                System.out.println("x. Freeze");
                System.out.println("y. Chill");

                char mageAdditionalEffect = scanner.next().charAt(0);

                switch (mageAdditionalEffect) {
                    case 'x':
                        System.out.println("The enemy is frozen solid! Your next attack is more effective.");
                        break;
                    case 'y':
                        System.out.println("The enemy is chilled, reducing their speed.");
                        break;
                    default:
                        System.out.println("Invalid additional effect. The spell fizzles.");
                        break;
                }
                break;
            default:
                System.out.println("Invalid spell. Your magical energy backfires!");
                break;
        }
    }

    private static void handleRogueActions(Scanner scanner) {

```

```

        System.out.println("Choose your action as a Rogue:");
        System.out.println("1. Sneak Attack");
        System.out.println("2. Evasion");

        int rogueAction = scanner.nextInt();

        switch (rogueAction) {
            case 1:
                System.out.println("You perform a deadly Sneak Attack, catching the enemy off guard!");
                break;
            case 2:
                System.out.println("You evade the enemy's attack with finesse, taking minimal damage.");
                System.out.println("Choose your evasive move:");
                System.out.println("u. Backflip");
                System.out.println("v. Sidestep");

                char rogueEvasiveMove = scanner.next().charAt(0);

                switch (rogueEvasiveMove) {
                    case 'u':
                        System.out.println("You execute a perfect backflip, avoiding the enemy's strike!");
                        break;
                    case 'v':
                        System.out.println("You swiftly sidestep the enemy's attack, remaining unscathed.");
                        break;
                    default:
                        System.out.println("Invalid evasive move. The enemy anticipates your actions!");
                        break;
                }
                break;
            default:
                System.out.println("Invalid action. The enemy anticipates your actions!");
                break;
        }
    }
}

//Welcome to RPG Adventure!
// Choose your character class:
// 1. Warrior
// 2. Mage
// 3. Rogue
// 1
// You are a mighty Warrior! Prepare for battle!
// Choose your action as a Warrior:
// 1. Attack
// 2. Defend
// 2
// You raise your shield and prepare for the enemy's attack.
// Choose your defensive move:
// a. Block
// b. Counter
// a
// You successfully block the enemy's attack!

```