//Q1: Write a method to calculate the factorial of a number.

//Program:
```
import java.util.Scanner;
public class a5q1 {
    static long factorial (int n) {
        long fact = 1;
        for (int i = 1; i <= n; i++)
            fact *= i;
        return fact;
    }
    public static void main (String args[]) {
        Scanner obj = new Scanner(System.in);
        System.out.print ("Enter an integer:");
        int n = obj.nextInt();
        System.out.println ("Factorial = " + factorial (n));
    }
}
```

//output:

Enter an integer: 7

factorial = 5040

//Q2: Write a method power(a,b) to calculate a^b.

//Program:
```
import java.util.Scanner; <- public class a5q2 {
public static void main (String args[]) {
    Scanner sc = new Scanner (System.in);
    System.out.print ("Enter a:");
    double a = sc.nextDouble();
    System.out.print ("Enter b:");
    double b = sc.nextDouble();
    System.out.println ("Result=" + power (a, b));
}
static double power (double a, double b) {
    return Math.pow(a, b); }
}
```

```
//output:
        Enter a : 2
        Enter b : 2
        Result = 4.0
```

//Q3: Write a method to check wheather a given year is leap year.

```
//Program: import java.util.Scanner;
        public class asq3 {
            Static boolean isLeap (int year) {
                return(year % 400 == 0) || (year % 4 == 0 &&
                                    year % 100 != 0);
            }
            public static void main (String[] args) {
                Scanner sc = new Scanner (System.in);
                System.out.print("Enter year: ");
                int y = sc.nextInt();
                System.out.println (isLeap (y) ? "Leap Year":
                                    "Not a Leap Year");
            }
        }
```

```
// output:

        Enter year: 2024
        Leap Year
```

//Q4: Define a method that receives an int, float, and double, and returns a decimal value.

```
//Program: public class asq4 {
            Static double fun(int a, float b, double c) {
                return a+b+c;
            }
            public static void main (String args[]) {
                System.out.println(fun(5, 3.5f, 2.75));
            }
        }
```

```
//output:

        11.25
```

```
//Q5: Define an overloaded max() method to return the largest
    of two ints/floats/doubles.

//Program: public class asq5{
            static int max(int a, int b){
                return a>b ?a:b;
            }
            static float max(float a, float b){
                return a>b ?a:b;
            }
            static double max(double a, double b){
                return a>b ? a:b;
            }
            public static void main(String args[]){
                System.out.println(max(5,9));
                System.out.println(max(5.3f, 2.8f));
                System.out.println(max(10.2, 8.6));
            }
        }

//output:
    9
    5.3
    10.2

//Q6: Define an overloaded Area() method to find the area of
    circle, rectangle, and triangle.

//Program: public class asq6{
            static double Area(double r){
                return Math.PI*r*r;
            }
            static double Area(double l, double b){
                return l*b;
            }
            static double Area(double b, double h, boolean triangle){
                return 0.5*b*h;
            }
            public static void main(String args[]){
                System.out.println("Circle: "+Area(5));
                System.out.println("Rectangle: "+Area(4,6));
                System.out.println("Triangle: "+Area(4,5,true));
            }}
```

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```
//output:

    Circle: 78.5398163397448 3
    Rectangle: 24.0
    Triangle: 10.0

//Q7: Write a recursive method to find the sum of digits of a
    5-digit number.

//Program: import java.util.Scanner;
           public class as97 {
               Static int SumDigits (int n) {
                 if (n==0)
                    return 0;
                 return n %10 + sumDigits (n /10);
               }
             public static void main (String args[]) {
                Scanner sc = new Scanner (System.in);
                System.out.print ("Enter 5-digit number:");
                int n = sc.nextInt();
                System.out.println ("Sum = "+ sumDigits(n));
             }
           }

//output:

    Enter 5-digit number: 21356
    Sum = 17

// Q8: Write a recursive method to find the prime factors of a
    number.

//Program: import java.util.Scanner;
           public class as98 {
               Static void primefactors (int n, int i) {
                 if (n==1)
                    return;
                 if (n%i==0) {
                    System.out.print (i+" ");
                    primefactors (n/i, i);
                 }
                 else {
                    primefactors (n, i+1);
               } }
```

```
public static void main(String [] args){
    Scanner sc = new Scanner(System.in);
    System.out.print("Enter number: ");
    int n = sc.nextInt();
    primefactors(n, 2);
}
}
```

//output:

Enter number: 12
2 2 3

//Q9: Write a recursive method to display the first 25 fibonacci numbers.

//Programy:

```
public class a5q9 {
    static int fib(int n) {
        if(n<=2)
            return 1;
        return fib(n-1)+fib(n-2);
    }
    public static void main(String args[]) {
        for(int i=1; i<=25; i++)
            System.out.print(fib(i)+" ");
    }
}
```

//output:

1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025.

//Q10: Write a recursive method to convert a number into its binary equivalent.

//Program:
```
import java.util.Scanner;
public class asq10{
    Static void binary(int n) {
        if (n==0)
            return;
        binary(n/2);
        System.out.print(n%2); }
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter number: ");
        int n= sc.nextInt();
        binary(n);
    }
}
```

//output:

```
Enter number: 5
101
```

//Q11: Write a recursive method to find the running sum of the first 25 natural numbers.

//Program:
```
public class asq11{
    static int sum(int n) {
        if (n==1)
            return 1;
        return n+sum(n-1); }
    public static void main(String args[]){
        System.out.println("Sum = "+sum(25));
    }
}
```

//output:

```
Sum = 325
```

//Q12: Write a method fun() that finds the minimum value from a variable-length argument list.

```
//Program: public class as9q12 {
            Static int fun(int... a) {
              int min = a[0];
              for (int x : a)
                  if (x < min)
                      min = x;
              return min;
            }
            public static void main (String args[]) {
                System.out.println(fun(5, 2, 9, 1, 7));
            }
        }
```

//output:

1

//Q13: Write a method that accepts an integer array and returns the sum of its elements.

```
//program: public class as9q13 {
            static int arraySum(int arr[]) {
              int s = 0;
              for(int x : arr)
                  s+ = x;
              return s;
            }
            public static void main(String args[]) {
              int a[] = {1, 2, 3, 4, 5};
              System.out.println("Sum =" + arraySum(a));
            }
        }
```

//output:

Sum = 15

//Q14: Write a menu-driven Banking System program using methods to:
- create account
- deposit
- withdraw
- display details
- check balance.

//Program:

```
import java.util.Scanner;
class Bank {
    int accNo;
    String name;
    double bal;
    void create(int a, String n, double b) {
        accNo = a;
        name = n;
        bal = b;
    }
    void deposit(double amt) {
        bal += amt;
    }
    void withdraw(double amt) {
        if(bal >= amt)
            bal -= amt;
        else
            System.out.println("\nInsufficient Balance");
    }
    void display() {
        System.out.println(accNo + " " + name + " " + bal);
    }
}
class a5Q14 {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        Bank ob = new Bank();
        ob.create(101, "Satyajeet", 5000);
```

```
int ch;
do {
    System.out.println("1.Deposit 2.Withdraw 3.Display
                        4.Exit");

    ch = sc.nextInt();
    switch (ch){
        case1:
            ob.deposit(sc.nextDouble());
            break;
        case2:
            ob.withdraw(sc.nextDouble());
            break;
        case3:
            ob.display();
            break;
    }
}while (ch!=4);
}
}
```

Output:

```
1.Deposit 2.Withdraw 3.Display 4.Exit
2
500
1.Deposit 2.Withdraw 3.Display 4.Exit
3
101 Satyajeet 4500.0

1.Deposit 2.Withdraw 3.Display 4.Exit.
4
```

//Q15: Write a Java program to store and display employee details using an array of objects.

```
//program: import java.util.Scanner;
class Employee {
    int id;
    String name;
    double salary;
    void get(int i, String n, double s) {
        id = i;
        name = n;
        salary = s;
    }
    void show() {
        System.out.println(id + " " + name + " "
                + salary);
    }
}

public class as9/5 {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        Employee e[] = new Employee[3];
        for(int i = 0; i < 3; i++) {
            e[i] = new Employee();
            System.out.print("Enter id name salary:");
            e[i].get(sc.nextInt(), sc.next(),
                                sc.nextDouble());
        }
        System.out.println("\n Employee Details:");
        for (Employee emp : e)
            emp.show();
    }
}
```

```
//output:
    Enter id name salary: 01 Satyajeet 25000
    Enter id name salary: 02 Sarthak 26000
    Enter id name salary: 03 Swati 27000

    Employee Details:
    1 Satyajeet 25000.0
    2 Sarthak 26000.0
    3 Swati 27000.0
```