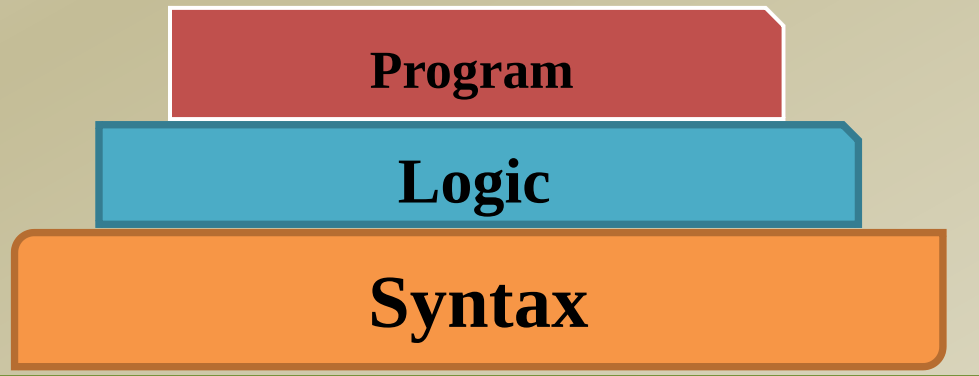
Code at Random (OPC) PVT. LTD.

Module 5: More Programming Based On Series.



Practice Problems

- $S = 1 + x + 2x + 3x + \ldots$ *n terms*
- $S = 1 + x + \frac{x}{2} + \frac{x}{3} + \ldots$ *n terms*
- $S = 1 + x + \frac{x^3}{2} + \frac{x^5}{3} + \ldots$ *n terms*
- $S = 1 + x - 2x + 3x - \ldots$ *n terms*
- $S = 1 - x + \frac{x^2}{8} - \frac{x^3}{27} + \ldots$ *n terms*
- $S = 1 - x + \frac{x}{2} - \frac{x}{3} + \ldots$ *n terms*
- $S = 1 - \frac{x}{2} + \frac{x^2}{3} - \ldots$ *n terms*
- $S = \frac{1}{a} - \frac{1}{a+b} + \frac{1}{a+2b} - \frac{1}{a+3b} + \ldots$ *n terms*

Solution to above questions

1.
```
public static void main(String[] Args) {
    int i,x,n;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++)
    {
       s=s+(i*x);
    }
    System.out.println(s);
}
```

2.
```
public static void main(String[] Args)    {
    int i,x,n;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++)
    {
       s=s+(x/i);
    }
    System.out.println(s);
}
```

Solution to above questions

3.
```
public static void main(String[] Args)    {
    int i,x,n;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++)
    {
       s=s+(Math.pow(x,2*i-1)/i);
    }
    System.out.println(s);
  }
```

4.
```
public static void main(String[] Args)    {
    int i,x,n,sign=1;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++) {
       s=s+((x*i))*sign;
       sign*=-1;
    }
    System.out.println(s);
  }
```

Solution to above questions

5.
```
public static void main(String[] Args)  {
    int i,x,n,sign=-1;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++)   {
        s=s+(Math.pow(x,i)/(i*i*i))*sign;
        sign*=-1;
    }
    System.out.println(s);
}
```

6.
```
public static void main(String[] Args)    {
    int i,x,n,sign=-1;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++)       {
        s=s+(x/i)*sign;
        sign*=-1;
    }
    System.out.println(s);
}
```

Solution to above questions

7.
```
public static void main(String[] Args) {
    int i,x,n,sign=-1;
    double s=1.0;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of x");
    x= sc.nextInt();
    for(i=1;i<=n-1; i++)       {
       s=s+(Math.pow(x,i)/(i+1))*sign;
       sign*=-1;
    }
    System.out.println(s);
 }
```

8.
```
public static void main(String[] Args)    {
    int i,a,b,n,sign=-1;
    Scanner sc= new Scanner(System.in);
    System.out.println("Enter the number of terms");
    n=sc.nextInt();
    System.out.println("Enter the value of a and b");
    a= sc.nextInt();
    b= sc.nextInt();
    double s=1.0/a;
    for(i=1;i<=n-1; i++)       {
       s=s+(1.0/(a+i*b))*sign;
       sign*=-1;
    }
    System.out.println(s);
```