

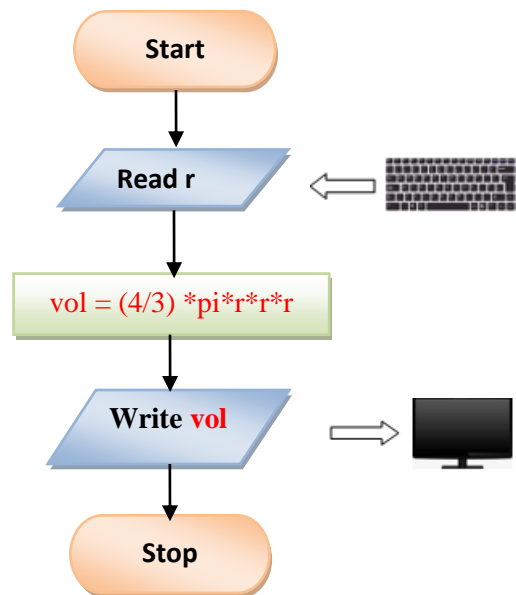
## Solved Assignment Problems in Java (with Algorithm and Flowchart)

**Q1.** Create a program to compute the volume of a sphere. Use the formula:  $V = (4/3) * \pi * r^3$  where pi is equal to 3.1416 approximately. The r is the radius of sphere. Display the result.

### Algorithm

1. Start
2. Read r
3.  $vol = (4/3) * \pi * r * r * r$
4. Print or display vol
5. Stop

### Flowchart



### Program

```
import java.util.Scanner;

public class VolSphere{

    public static void main(String [] args) {

        Scanner Ob1 = new Scanner(System.in);

        System.out.println("Enter radius of sphere:");
        int r = Ob1.nextInt();
        double pi = 3.1416;
        double vol = (4/3)*pi*r*r*r;

        System.out.println("Volume of sphere is: " +vol);

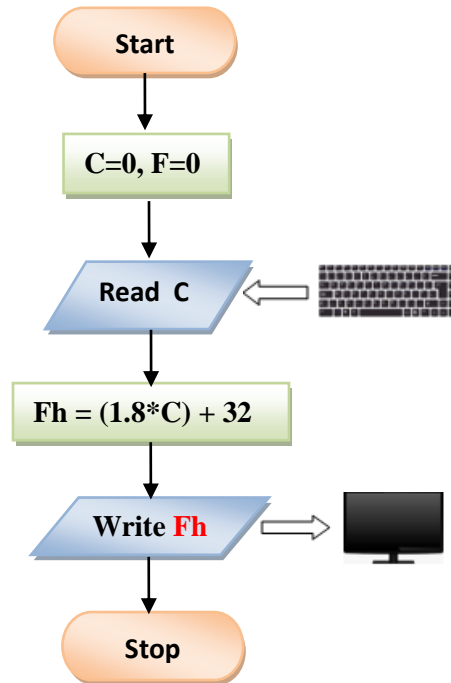
    }
}
```

**Q2.** Write a program the converts the input Celsius degree into its equivalent Fahrenheit degree. Use the formula:  $F = (9/5) * C + 32$ .

**Algorithm**

1. Start
2. Initialize F=0, C=0
3. Read C
4.  $F_h = (1.8 * C) + 32$
5. Print or display  $F_h$
6. Stop

**Flowchart**



**Program**

```
import java.util.Scanner;

public class CelsToFahrenheit{

public static void main(String[]args) {

    Scanner Ob1 = new Scanner(System.in);

    System.out.println("Enter temperature in Celsius:");
    float C = Ob1.nextInt();

    double Fh = (1.8*C)+ 32;

    System.out.println("Converted Fahrenheit value is: " +Fh);

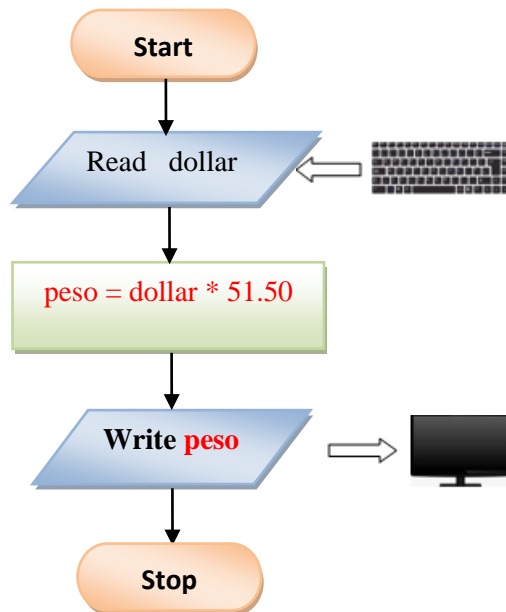
}
}
```

**Q3.** Write a program that converts the input dollar to its peso exchange rate equivalent. Assume that the present exchange rate is 51.50 pesos against the dollar. Then display the peso equivalent exchange rate.

### Algorithm

1. Start
2. Read dollar
3.  $\text{peso} = \text{dollar} * 51.50$
4. Print or display **peso**
5. Stop

### Flowchart



### Program

```
import java.util.Scanner;

public class DollarToPeso{

public static void main(String [] args) {

    Scanner Ob1 = new Scanner(System.in);

    System.out.println("Enter amount of dollars to convert:");
    float dollar = Ob1.nextInt();

    double peso = dollar*51.50;

    System.out.println("Equivalent peso is: " +peso);

}
}
```

**Q4.** Write a program that converts an input inch(es) into its equivalent centimeters. Take note that one inch is equivalent to 2.54cms

**Algorithm**

1. Start
2. Read inch
3.  $cm = 2.54 * inch$
4. Print or display **cm**
5. Stop

**Flowchart**



**Program**

```
import java.util.Scanner;

public class InchToCM{

public static void main(String [] args) {

    Scanner Ob1 = new Scanner(System.in);

    System.out.println("Enter inches:");
    float inch = Ob1.nextInt();

    double cm = 2.54* inch;
    System.out.println("Equivalent centimeter is: " +cm);

}

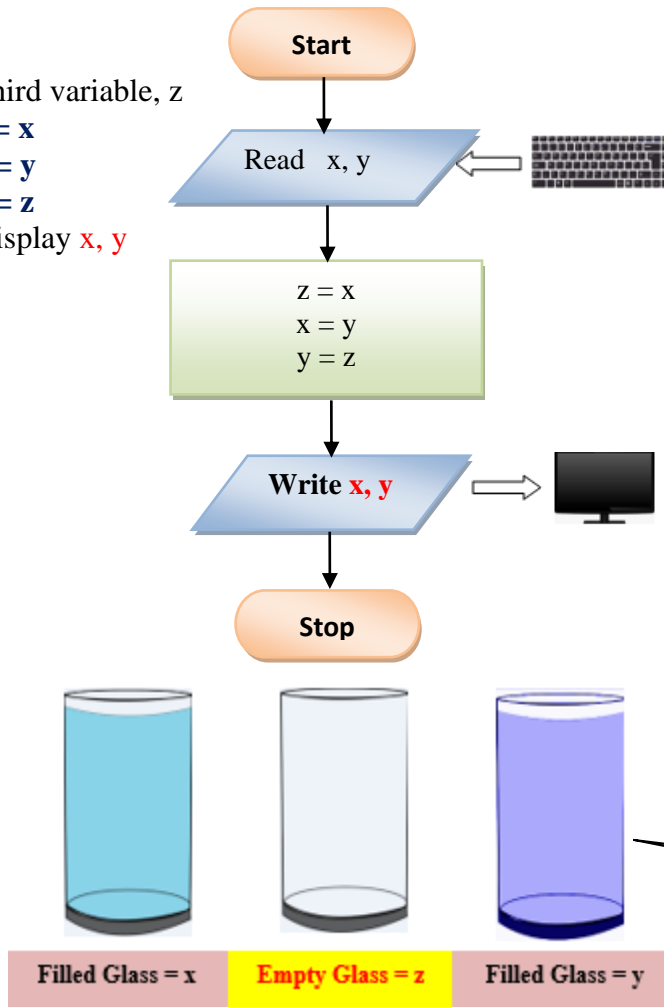
}
```

**Q5.** Write a program that exchanges the value of two variables: x and y. The output must be: the value of variable y will become the value of variable x, and vice versa.

**Algorithm**

1. Start
2. Read x, y
3. Declare third variable, z  
 $z = x$   
 $x = y$   
 $y = z$
4. Print or display x, y
5. Stop

**Flowchart**



**Program**

```

import java.util.Scanner;

public class SwappingVariables{

public static void main(String [] args) {

    Scanner Ob1 = new Scanner(System.in);

    System.out.println("Enter value of A: ");
    int x = Ob1.nextInt();

    System.out.println("Enter value of B: ");
    int y = Ob1.nextInt();

    System.out.println("Before swapping, values of x and y are" +x +y);
    int z = x;
    x = y;
    y =z;

    System.out.println("After swapping, values of x and y are: " +x +y);

}
}
  
```

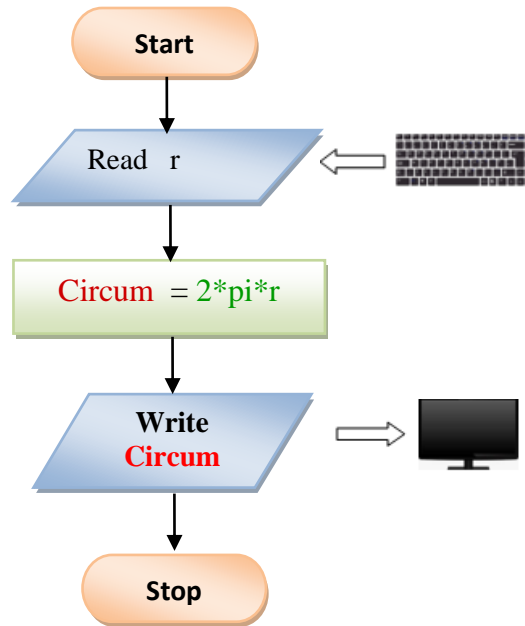
Image by [sedatgunduz](https://www.pexels.com/photo/empty-glass-1000000000/) from Pixabay

**Q6.** Design a program to find the circumference of a circle. Use the formula:  $C=2\pi r$ , where  $\pi$  is approximately equivalent 3.1416.

**Algorithm**

1. Start
2. Read r
3. Calculate circumference by the equation:  
 $Circum = 2 * \pi * r$
4. Print **Circum**
5. Stop

**Flowchart**



**Program**

```
package circumference;

import java.util.Scanner;

public class circumference {
    public static void main(String [] args) {

        Scanner Ob1 = new Scanner(System.in);

        System.out.println("Enter radius of circle r: ");
        int r = Ob1.nextInt();

        double pi = 3.1416;

        double Circum = 2*pi*r;
        System.out.println("circumference of circle is:" +Circum);

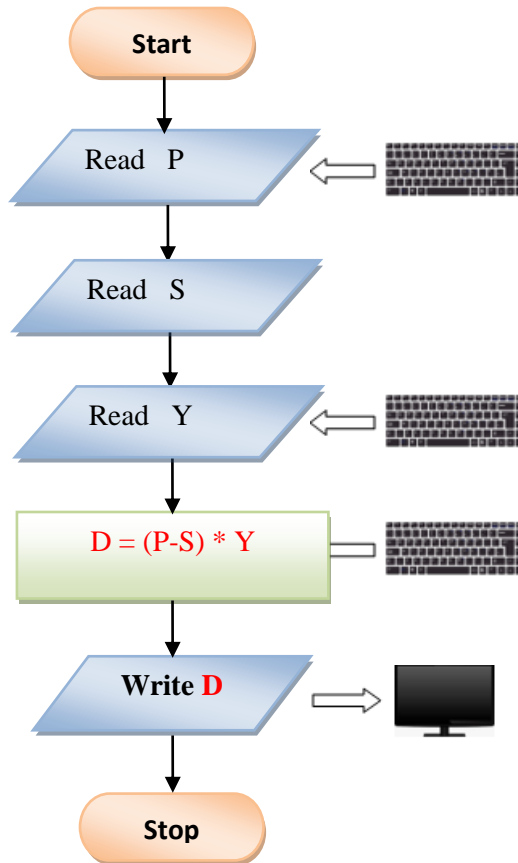
    }
}
```

**Q7.** Write a program that takes as input the purchase price of an item (P), its expected number of years of service (Y) and its expected salvage value (S). Then outputs the yearly depreciation for the item (D). Use the formula:  $D = (P - S) Y$

**Algorithm**

1. Start
2. Read P
3. Read S
4. Read Y
5.  $D = (P-S) * Y$
6. Print or display D
7. Stop

**Flowchart**



**Program**

```
package depreciation;

import java.util.Scanner;

public class depreciation{
    public static void main(String [] args) {

        Scanner Ob1 = new Scanner(System.in);

        System.out.println("Enter purchase price of an item P: ");
        float P = Ob1.nextInt();

        System.out.println("Enter expected salvage value S: ");
        float S = Ob1.nextInt();

        System.out.println("Enter expected number of years of service Y");
        float Y = Ob1.nextInt();

        double D = (P-S)*Y;

        System.out.println("Product depreciation is:" +D);

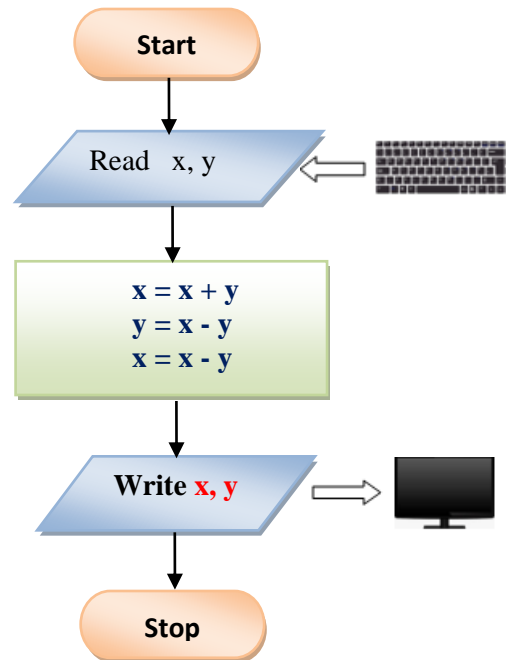
    }
}
```

**Q8.** Swapping of 2 variables without using temporary (or 3<sup>rd</sup> variable)

**Algorithm**

1. Start
2. Read x and y
3.  $x = x + y$   
 $y = x - y$   
 $x = x - y$
4. Print or display x, y
5. Stop

**Flowchart**



**Program**

```
package swap_variables;

import java.util.Scanner;

public class swap_variables{
    public static void main(String [] args) {

        Scanner Ob1 = new Scanner(System.in);

        System.out.println("Enter value of x: ");
        int x = Ob1.nextInt();

        System.out.println("Enter value of y: ");
        int y = Ob1.nextInt();

        System.out.println("Before swapping, values of x and y are: " +x +"\t" +y);
        x = x+y; //suppose x = 10, y = 20, then x = 10+20 = 30
        y = x-y; //y = x-y = 30 - 20 = 10
        x = x-y; //x = x - y = 30 - 10 = 20

        System.out.println("After swapping, values of x and y are: " +x +"\t" +y);
    }
}
```



**Q9.** Determine the most economical quantity to be stocked for each product that a manufacturing company has in its inventory: This quantity, called economic order quantity (EOQ) is calculated as follows:  $EOQ = \sqrt{2RS/I}$  where: R= total yearly production requirement S=set up cost per order I=inventory carrying cost per unit

**Algorithm**

1. Start
2. Read R
3. Read S
4. Read I
5.  $EOQ = (2 * R * S) / I$
6. Print EOQ
7. Stop

**Flowchart**



**Program**

```

import java.util.Scanner;

public class EOQ{
    public static void main(String [] args) {

        Scanner Ob1 = new Scanner(System.in);

        System.out.println("Enter total yearly production R:");
        int R = Ob1.nextInt();

        System.out.println("Enter set up cost S:");
        int S = Ob1.nextInt();

        System.out.println("Enter inventory cost I:");
        int I = Ob1.nextInt();

        double EOQ = (2*R*S)/I;

        System.out.println("economic order quantity EOQ is:" +EOQ);

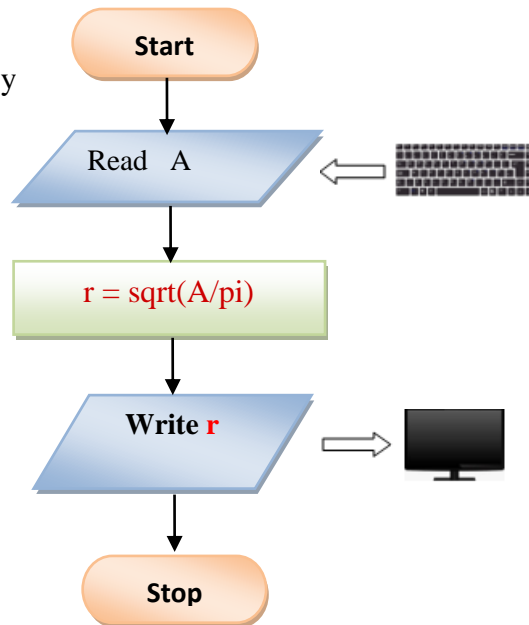
    }
}
  
```

**Q10.** Write a program to compute the radius of a circle. Derive your formula from the given equation:  $A = \pi r^2$ , then display the output.

**Algorithm**

1. Start
2. Read r
3. Calculate radius by the equation:  
 $r = \sqrt{A/\pi}$
4. Write r
5. Stop

**Flowchart**



**Program**

```
import java.util.Scanner;
import java.lang.Math;

public class CircleRadius {
    public static void main(String [] args) {

        Scanner Ob1 = new Scanner(System.in);

        System.out.println("Enter area of circle A: ");
        int A = Ob1.nextInt();

        double pi = 3.1416;

        :

        double r = Math.sqrt(A/pi);
        System.out.println("Radius of circle is:" +r);

    }
}
```