|  |  |  |  |
| --- | --- | --- | --- |
| point | JRE | JVM | JDK |
| definition | java runtime environment | java virtual machine | java development kit |
| function | a key role in setting up the environment for code execution belongs to JRE. | all the implementation are specified by JVM and it is in charge of giving the JRE access to all of these implementation. | the jdk mainly aids with the execution of programmes and its main uses are in development. |

2. Write once run everywhere refers to the ability of java appilications to operate on several systems without having to be manually rewritten for each platform.

3. output : 2

                3

                4

in this code using two "for" loops for repeating the input array elements to check the duplicate array elements. for this checkup,"if" condition is used. after checkup , duplicate elements will be printed . by using ln function ,the duplicate array will printed in next line.

4.  import java.util.scanner;

     public class area\_and\_perimeter{

          public static void main (string[] args){

               Scanner sc = new Scanner(System.in);

              system.out.println("input the length of the rectangle: ");

              double length = input.nextdouble();

              system.out.println("input the width of the rectangle: ");

              double width = input.nextdouble();

           double perimeter = 2\*(length + width);

           double area = length \* width;

          system.out.println("area of rectangle is: "+area);

          system.out.println("perimeter of rectangle is: "+perimeter);

}}

5. import java.util.scanner;

     public class area{

          public static void main (string[] args){

               Scanner sc = new Scanner(System.in);

               system.out.println("input the diameter of circle: ");

               double diameter = input.nextdouble();

               double radius = daimeter/2

               final float pi = 3.14;

           double area = pi \* (radius \* radius);

          system.out.println(" "+area);

}}

 6. import java.util.scanner;

     public class total\_and\_percentage{

          public static void main (string[] args){

               Scanner sc = new Scanner(System.in);

               system.out.println("Mark of subject A: ");

               double a = input.nextdouble();

               system.out.println("Mark of subject B: ");

               double b = input.nextdouble();

               system.out.println("Mark of subject C: ");

               double c = input.nextdouble();

               double total = a+b+c;

               float percent = total/3;

               system.out.println("Total marks: "+total);

              system.out.println("Percentage: "+percent);

}}

7. import java.util.scanner;

    public class swap{

        public static void main(string[] args){

               Scanner sc = new Scanner(System.in);

               system.out.println("value of a: ");

               int a = input.nextint();

               system.out.println("value of b: ");

               int b = input.nextint();

               int temp = a;

               a = b;

               b = temp;

               system.out.println("value of a:"+a);

               system.out.println("value of b: "+b);

}}

8. import java.util.scanner;

    public class test{

        public static void main(string[] args){

              double a = -5 + 8 \* 6;

              double b = (55+9) % 9;

              double c = 20 + -3\*5 / 8;

              double d = 5 + 15 / 3 \* 2 - 8 % 3;

               system.out.println(""+a);

              system.out.println(""+b);

              system.out.println(""+c);

              system.out.println(""+d);

}

}

9. import java.util.scanner;

    public class power{

        public static void main(string[] args){

               Scanner sc = new Scanner(System.in);

               system.out.println("insert the value of a: ");

               int a = input.nextint();

               system.out.println("insert the value of b: ");

               int b = input.nextint();

               while(b != 0){

                  result = result \* a;

                  b--;

                }

               system.out.println(""+result);

   }

   }

10. import java.util.scanner;

    public class power{

        public static void main(string[] args){

               Scanner sc = new Scanner(System.in);

               system.out.println("insert the value in fahrenheit: ");

               float a = input.nextfloat();

               float celsius = (a-32) \* 5/9;

               system.out.println(""+celsius);

     }

    }