1. Read the following code fragments and explain and if possible correct errors if any.(10 pts)

(a)

```
public class C {
   public static void main(String[] args) {
      method1();                          //-----------(a)
   }

   public void method1() {
      method2();
   }

   public static void method2() {
      System.out.println("What is radius " + c.getRadius()); //---------(b)
   }
}
```

Answer(a):

Answer(b):

(b)

```
public class Test {
   public static method1(int n, int m) {   //----------------(c)
      n += m;
      method2(3.4);                      //----------------(d)
   }

   public static int method2(int n) {
      if (n > 0) return 1;
      else if (n == 0) return 0;
      else if (n < 0) return -1;       //-----------------(e)
   }
}
```

Answer(c):

Answer(d):

Answer(e):

2. In this question, write the asked methods.

   (a) Write a program that reads ten numbers from the keyboard and displays the number of distinct numbers and then displays the distinct numbers separated by exactly one space (i.e, if a number appears multiple times, it is displayed only once). (*5 points* **Answer:**

   (b) Write a method isValid() to check whether the user entered a valid password. Suppose the password rules are as follows:

   - A password must be at least eight characters.
   - A password consists of only letters and digits.
   - A password must contain at least two digits.

   If the password is valid display **Valid Password** or displays **Invalid Password** otherwise. (*5 pts*) **Answer:**

3. For this question, only write methods asked, Write the methods in the order asked.

(a) Create a class called Android whose objects have unique data. The class has the following attributes.

- **tag** - a static integer that begins at 1 and changes each time an instance is created
- **name** - a string that is unique for each instance of this class.

Answer

(b) Write **Android**, a default constructor that sets the name to "Bob" concatenated with the value of the tag. After setting the name, this constructor changes the value of tag by calling the private method **changeTag()**.

(c) **getname()** - returns the name portion of the invoking object.

(d) **isPrime()** - A private static method that returns true if n is prime - that is, if it is not divisible by any number from 2 to n-1.

(e) **changeTag()** - a private static method that replaces tag with the next prime number larger than the current value of the tag.

4. Here is a code for a recursive method **mystery**. What is printed when **mystery(2,2)** is called?

```
public class TestMystery {

    public static void main(String[] args) {
        mystery(2,2);
    }

    public static void mystery(int a, int b) {
        if( a == 0 && b == 0)
            System.out.println(0);
        else if ( a == 0) {
            System.out.println(b);
            mystery(a, b-1);
        }
        else {
            mystery(a-1, b);
            System.out.println(b);
        }
    }
}
```

Write the output in the order it will be printed when the program is run on the computer.

5. A palindrome is any word, phrase, or sentence that reads the same forward and backward. Here are some well-known palindromes:

Able was I ere I saw Elba
Desserts I stressed
kayak
Write a complete java program that uses recursion to determine whether a string argument is a palindrome. The program should have a main method and a static recursive method called **isPalindrome**.