1. What is the output of the following code:

```
int s = 0;
int t = 1;
for ( int i = 0 ; i < 10 ; i++ ) {
        s = s + i;
        for ( int j = i ; j > 0 ; j-- ) {
                t = t * (j - i);
        }
        s = s * t;
        System.out.println("t = " + t);
}
System.out.println("s = " + s);
```

2. Given an array of `String`. Each element in the array contains a `String` object. Example:

"Sameh"	"Eliot"	"Sarah"	"Dalia"	"Nidal"

Write a method with the following signature:

```
public String combine(String[] strings)
```

Which combines the `Strings` to form one `String` that would contain the first letters of each String, followed by the second letter from each string, etc.... You may assume that all Strings have the same length, but you may not assume that the array only has 5 entries. The above array would return the following `String`:

"SESDNalaaimirldeoaiahthal"

3. Given the following classes, show the output from running the Test class and give an explanation:

```
public class Vehicle {
   public Vehicle() {
      System.out.println("New Vehicle");
   }
   public void drive() {
      System.out.println("Vehicle: drive");
   }
}
```

```
public class SportsCar extends Car {
   public SportsCar() {
      System.out.println("New SportsCar");
   }
   public void drive() {
      System.out.println("Sports Car: drive fast");
   }
}
```

```
public class Car extends Vehicle {
   public Car() {
      System.out.println("New Car");
   }
   public void drive() {
      System.out.println("Car: drive");
   }
}
```

```
public class Test {
   public static void main(String args[]) {
      Vehicle v = new Vehicle();
      Car c = new Car();
      SportsCar sc = new SportsCar();
      v.drive();
      c.drive();
      sc.drive();
      v = c;
      v.drive();
      c = sc;
      c.drive();
      v = sc;
      v.drive();
   }
}
```

4. Write a `for` loop to compute the sum $1^2 + 2^2 + 3^2 + 4^2 + 5^2 + \ldots + n^2$. Assume that `n` is a variable that has already been defined.

5. Show the output from running the Test class:

```
public class Test {
   public static void main(String args[]) {
      Integer i1 = new Integer(9);
      Integer i2 = new Integer(9);

      if (i1 == i2)
         System.out.println("Test1");
      if (i1.equals(i2))
         System.out.println("Test2");
      if (i1.equals(new Integer(9)))
         System.out.println("Test3");
   }
}
```

6. Write a complete Java class named `MyClass` that has the following `private` attributes:

   a. myInts, an array of `int`'s that has a maximum capacity of 100.
   b. numInts, an `int` variable that keeps track of the number of elements in myInts.

   And the following methods:

   a. `public` MyClass() – Constructor that intitializes myInts and numInts.
   b. `public int` addInt(int i) – Adds i to myInts and updates numInts. Returns the index where i was added. If there is no room to add i to myInts, return -1.
   c. `public int` find(int i) – Find the first occurence of i in myInts and return its index, return -1 if not found.
   d. `public int` getInt(int i) – Return the integer at index i if it exists, return -9999 otherwise.
   e. `public boolean` isFull() – Returns true if myInts is full, false otherwise.
   f. `public boolean` isEmpty() – Returns true if myInts is empty, false otherwise.