

### QUESTION 1

What is the console (screen) output of the following code?

```
public class Test {
    public static void main(String[] args) {
        int list[] = {1, 2, 3, 4, 5, 6};

        for (int i = 1; i < list.length; i++)
            list[i-1] = list[i];

        for (int i = 0; i < list.length; i++)
            System.out.print(list[i] + " ");
    }
}
```

- ☐ a. 2 3 4 5 6 6
- ☐ b. 1 2 3 4 5 6
- ☐ c. 1 1 1 1 1 1
- ☐ d. Runtime/compilation error
- ☐ e. 2 3 4 5 6 1

### QUESTION 2

Analyze the following code and choose the best answer:

```
class Test {
    public static void main(String[] args) {
        System.out.println(mult(7));
        System.out.println(mult(4, 6));
    }
    public static int mult(int n, int t) {
        System.out.println("two int ");
        return n*t;
    }
    public static long mult(int n) {
        System.out.println("one int ");
        return n*2;
    }
}
```

- ☐ a. The program does not compile because Java compiler cannot distinguish which mult to invoke.
- ☐ b. The program displays "two int" followed by 24. Then displays "one int" followed by 14.
- ☐ c. The program displays "one int" followed by 14. Then it displays "two int" followed by 24.
- ☐ d. The program displays "one int" followed by 14.

### QUESTION 3

What is the output of the following code?

```
public static void main(String[] args) {
    int[] rgiFib = {0,1,0,0,0,0,0,0};
    guessWhat(rgiFib);

    for (int i=0;i<rgiFib.length;i++)
        System.out.print(rgiFib[i] + " ");
}

public static void guessWhat(int rgiFib[]) {
    for (int i=2;i<rgiFib.length;i++)
        rgiFib[i] = -rgiFib[i-1] + 2 * rgiFib[i-2];
}
```

### Question 4

The following program is to calculate the tuition to be at or more than \$15,000 with the tuition increase rate at 5% with a current tuition. You are asked to modify the program so that it can calculate the years to take for the current tuition reaches at any target tuition with an increase rate the user provides. In the program, there are a few places that can be turned into methods.

- When writing Java code as your answer, you **MUST TURN OFF SPELL CHECKER**  for **EACH** problem you answer. Otherwise, your answer may be changed by spell checker.

FutureTuition.java (to be referenced in later problems 4.b, 4.c, 4.d, and 4.e).

```

1 public class FutureTuition {
2     public static void main(String[] args) {
3         double tuition = 11000;    // tuition in Year 0
4         int year = 0;
5         double targetTuition = 15000.0;
6         double increaseRate = .05;
7         // calculate years for current tuition to be target tuition w/ increase rate
8         while (tuition < targetTuition) {
9             tuition = tuition * (1+increaseRate);
10            year++;
11        }
12        // display calculation result
13        System.out.print("It will take " + year + " years");
14
15        System.out.print("for Tuition to be " + tuition);
16    }
17 }

```

**Write a method** that will prompt the user to enter a target tuition and returns what the user enters. Eventually, the method call will replace the line 5.

### QUESTION 5

**Write a method** that will prompt the user to enter an increase rate and returns what the user enters. Eventually, the method call will replace the line 6 from FutureTuition.java.

[illegible]

### QUESTION 6

**Write a method** that calculates years to take for the current tuition to reach the target tuition with the increase rate, and returns the years. The current tuition, increase rate, and target tuition should be given to the method as input parameters. That corresponds to line 7~11 from FutureTuition.java. (10 pts)

### QUESTION 7

**Write a method** that will display (i.e. print) the calculation result, which corresponds to line 12~15 from FutureTuition.java.

### QUESTION 8

Rewrite the main method to call the methods you wrote in subproblems a ~ d. Your rewritten code here should behave exactly the same as FutureTuition.java given in problem 4.a *except* it is using the methods and ask for values from the user.

### QUESTION 9

You are asked to write a **program (Java class with main and any extra methods)** that will manage an election. It has been identified that the system will allow user to enter the number of candidates, their names, and votes. Then the system will tally the votes received and announce the name of the winner with the number of votes received. You are

asked to write the program to run as follows:

```

Welcome to Election Management System!
How many candidates are there? 5
Enter the name of Candidate 1: CharlesJ
Enter the name of Candidate 2: JenniJ
Enter the name of Candidate 3: RaeJ
Enter the name of Candidate 4: GilJ
Enter the name of Candidate 5: HannahJ

Now, enter the votes received.
Enter Candidate # (Enter 0 to finish): 1J
Enter Candidate # (Enter 0 to finish): 5J
Enter Candidate # (Enter 0 to finish): 4J
Enter Candidate # (Enter 0 to finish): 1J
Enter Candidate # (Enter 0 to finish): 3J
Enter Candidate # (Enter 0 to finish): 6J
NOT A VALID VOTE!!
Enter Candidate # (Enter 0 to finish): 5J
Enter Candidate # (Enter 0 to finish): 1J
Enter Candidate # (Enter 0 to finish): 4J
Enter Candidate # (Enter 0 to finish): 1J
Enter Candidate # (Enter 0 to finish): 0J

Congratulations. Charles has won the election by earning 4 votes!!

```

Write the **program** using arrays and methods.


Hint) You should make use of two arrays (parallel arrays): one for names of candidates, the other for vote counters

- When writing java code as your answer, you **MUST TURN OFF SPELL CHECKER**  for EACH problem you answer. Otherwise, your answer may be changed by spell checker.



## QUESTION 10

Write the following *method* that tests whether the array (given as input parameter) has three consecutive numbers in increasing order. For example, a sequence of numbers 5, 4, 3, 6, 8, 7 has three increasing numbers (see underlined numbers), but 1, 5, 9, 6, 8, 7 does not. The method `isIncreasingThree`, should NOT print anything but checking (and returning) if there are three consecutive increasing numbers or not.

- When writing Java code as your answer, you **MUST TURN OFF SPELL CHECKER**  for **EACH** problem you answer. Otherwise, your answer may be changed by spell checker.

```
public static boolean isIncreasingThree(int[] values)
```

