Lab 10

1-)

Declare an array of double of size 365 to store daily temperatures for one year. Using this data structure, write a code fragment to find

- The hottest and coldest days of the year.
- The average temperature of each month.

- The difference between the hottest and coldest days of every month.
- The temperature of any given day. The day is specified by two input values: month (1, . . . , 12) and day (1, . . . , 31). Reject invalid input values (e.g., 13 for month and 32 for day).

2-)

. Write a program that computes the standard deviation of N real numbers. The standard deviation s is computed according to

$$s = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \cdots + (x_N - \bar{x})^2}{N}}$$

he variable $\bar{x}$ is the average of N input values x_1 through x_N. The program st prompts the user for N and then declares an array of size N.

3-) Optional

. Using a list (either an ArrayList or a LinkedList), write a fortune telling program. Repeatedly prompt the user with the message

```
Fortune (y/N)?
```

If the user enters Y, then display a randomly selected fortune from the list. If the user enters N, then stop the program. Define the class named Fortune. You can define and use a separate main class or include the main method in the Fortune class. Create the fortune list in the constructor. Include at least 10 fortunes. The following are sample fortunes you can use:

```
You will qet 4.0 GPA this semester.
Happiness is programming.
Satisfaction follows hard work.
Patience is virtue.
```

4-) Optional

. A codon is a triplet of nucleotides that specifies a single amino acid (a protein is a sequence of amino acids). Write a program that extracts codons found in an input DNA (or RNA) sequence and stores them in an ArrayList. For example, if the input is GATTCGATC, the program stores GAT, TCG, and ATC in an ArrayList. If the length of an input string is not a multiple of 3, then ignore any leftover nucleotides. For example, if the input is GATTCGA, then store GAT and TCG. Output codons in the list using the for-each loop. Repeat the operation until an empty string is entered.