Lab10: Many Structs
Objective: Learn to create descriptive well structured classes(data types)
Vocabulary:
Primitives-ints and doubles
Naming convention for Classes are Upper Case for all words (ComplexNumber)

Part 1: These classes use Primitives. Create classes for:
Money
ComplexNumber (a + bi, where you store a and b, but not the i)
DateClass
Fraction
Point

CreditCardAccount:
(What's included in creating a credit card account?)
First Name
Last Name
Account Number
Bank Name
Amount of $
CVC number
Expiration date
Type (visa, mc)

```
//Insert Code with comments here:
```

Part 2: Money functions.
In the Main class, create the following functions:
public static String moneyToString(Money m); // Returns a nice looking String such as "$1.23"
public static Money add(Money m1, Money m2); // Returns the sum of 2 Money objects
public static Money payWith20(Money m);
public static Money applyInterest(Money m, double interestRate);

```
//Insert Code with comments here:
```

Part 3: Money tasks
Create a function in the Main class called testCodeMoney(), and do the following:

a. Create a 100 element array of Money objects with values $0.01 - $1.00, and compute the sum.

```
//Insert Code with comments here:
```

b. Simulate a person depositing $10 per day over the course of a year into a bank account that pays 1% interest monthly (round down) at the end of each month. How much has the person saved?

```
//Insert Code with comments here:
```

c. Go to safeway.com, pick 5 items to purchase, and compute the change if you pay with $20. Remember to apply San Ramon's city sales tax rate which you can find on bing.com.

Part 4: Point functions

In the Main class, create the following functions:

```
public static String pointToString(Point p); // Returns a nice looking String such as "(1,2)"
public static Point midpoint(Point p1, Point p2); // Returns the midpoint between 2 Points
public static boolean isEqual(Point p1, Point p2);
public static int quadrant(Point p);
public static void verticalStretch(Point p, double a); // Stretch up and down
public static void horizontalStretch(Point p, double a); // Stretch left and right
public static void verticalShift(Point p, double a); // Shift up and down
public static void horizontalShift(Point p, double a); // Shift left and right
```

```
//Insert Code with comments here:
```

Part 5: Point tasks

Create a function in the Main class called testCodePoint(), and do the following:

a. Create a 5 element array of Points where the domain are the even integers between 2-10, and the mapping to the range is f(x) = 2x+3.

```
//Insert Code with comments here:
```

b. Perform a vertical stretch by a factor of 3 to each point (using a for loop) and print the results.

```
//Insert Code with comments here:
```

c. Perform a horizontal stretch by a factor of 2 to each point (using a for loop) and print the results.

```
//Insert Code with comments here:
```

d. Perform a vertical shift down 1 unit and print the results.

```
//Insert Code with comments here:
```

e. Perform a horizontal shift right 2 units and print the results.

```
//Insert Code with comments here:
```

f. Simulate sine by an array of Points (0,?), (1.57,?),(3.14,?),(4.71,?),(6.28,?)

```
//Insert Code with comments here:
```

g. Perform a vertical shift by 2, then a stretch by 2, and print the results.

```
//Insert Code with comments here:
```

h. Perform a vertical stretch by 2, then a shift by 2, and print the results.

```
//Insert Code with comments here:
```