CSE 215.11 Homework 1

**2.6 (*Sum the digits in an integer*) Write a program that reads an integer between 0 and 1000 and adds all the digits in the integer. For example, if an integer is 932, the sum of all its digits is 14.

Hint: Use the % operator to extract digits, and use the / operator to remove the extracted digit. For instance, 932 % 10 = 2 and 932 / 10 = 93.

Here is a sample run:

```
Enter a number between 0 and 1000: 999 Enter
The sum of the digits is 27
```

3.26 (*Use the &&, || and ^ operators*) Write a program that prompts the user to enter an integer and determines whether it is divisible by 5 and 6, whether it is divisible by 5 or 6, and whether it is divisible by 5 or 6, but not both. Here is a sample run of this program:

```
Enter an integer: 10 Enter
Is 10 divisible by 5 and 6? false
Is 10 divisible by 5 or 6? true
Is 10 divisible by 5 or 6, but not both? true
```

**3.23 (*Geometry: point in a rectangle?*) Write a program that prompts the user to enter a point (x, y) and checks whether the point is within the rectangle centered at (0, 0) with width 10 and height 5. For example, (2, 2) is inside the rectangle and (6, 4) is outside the rectangle, as shown in Figure 3.7b. (*Hint*: A point is in the rectangle if its horizontal distance to (0, 0) is less than or equal to 10 / 2 and its vertical distance to (0, 0) is less than or equal to 5.0 / 2. Test your program to cover all cases.) Here are two sample runs.

```
Enter a point with two coordinates: 2 2 Enter
Point (2.0, 2.0) is in the rectangle
```

```
Enter a point with two coordinates: 6 4 Enter
Point (6.0, 4.0) is not in the rectangle
```

***4.18** (*Student major and status*) Write a program that prompts the user to enter two characters and displays the major and status represented in the characters. The first character indicates the major and the second is number character 1, 2, 3, 4, which indicates whether a student is a freshman, sophomore, junior, or senior. Suppose the following chracters are used to denote the majors:

`M`: Mathematics
`C`: Computer Science
`I`: Information Technology

Here is a sample run:

```
Enter two characters: M1 Enter
Mathematics Freshman
```

```
Enter two characters: C3 Enter
Computer Science Junior
```

```
Enter two characters: T3 Enter
Invalid input
```

***4.21** (*Check SSN*) Write a program that prompts the user to enter a Social Security number in the format DDD-DD-DDDD, where D is a digit. Your program should check whether the input is valid. Here are sample runs:

```
Enter a SSN: 232-23-5435 Enter
232-23-5435 is a valid social security number
```

```
Enter a SSN: 23-23-5435 Enter
23-23-5435 is an invalid social security number
```

6.12 (*Display characters*) Write a method that prints characters using the following header:

```
public static void printChars(char ch1, char ch2, int
 numberPerLine)
```

This method prints the characters between `ch1` and `ch2` with the specified numbers per line. Write a test program that prints ten characters per line from `1` to `Z`. Characters are separated by exactly one space.

***6.4** (*Display an integer reversed*) Write a method with the following header to display an integer in reverse order:

```
public static void reverse(int number)
```

For example, `reverse(3456)` displays `6543`. Write a test program that prompts the user to enter an integer and displays its reversal.

6.9 (*Conversions between feet and meters*) Write a class that contains the following two methods:

```
/** Convert from feet to meters */
public static double footToMeter(double foot)

/** Convert from meters to feet */
public static double meterToFoot(double meter)
```

The formula for the conversion is:

```
meter = 0.305 * foot
foot = 3.279 * meter
```

Write a test program that invokes these methods to display the following tables:

Feet	Meters		Meters	Feet
1.0	0.305	|	20.0	65.574
2.0	0.610	|	25.0	81.967
...				
9.0	2.745	|	60.0	196.721
10.0	3.050	|	65.0	213.115