Homework 5

1. **(Single-dimension Array)** Write a program that will create an integer array with 1000 entries. After creating the array, initialize all of the values in the array to 0. Next, using the rand function, loop through the array and save a random number between 1 and 10 (inclusive) in each entry of the array. Once you have complete this, print out the following and then end the program:
   1. The sum of all of the numbers
   2. The average of all the numbers
   3. The number of times each number (1-10) occurred (hint: there are several ways to this step; and you're perfectly allowed to create a second array for this part if it helps)
2. **(Single-dimension Array)** Using a single-dimension array, write a program that will allow the user to enter in twenty *different* numbers between 1 and 1000. The requirements for the program state that a user must enter ***different*** numbers, so your program should check after each number is entered to make sure that the user has not entered that number before. If the user has not entered that number before, save it (hint: this as well as checking to ensure the number hasn't been entered before is why you need the array). If the user has entered the number before, print a message to the user informing them that they have already used that number, and ask them for a different number. After you have received 20 different numbers from the user, print them as a list and quit the program. Notes: Be sure not to terminate before you have received 20 different numbers, and be sure to ensure the user doesn't enter a number less than 1 or greater than 1000.
3. **(Two-dimension Array)** A company that pays their employees on a commission basis has contracted you to write a program that will calculate how much they owe their employees. The company has 4 employees and sells 5 different products. The products and the commission each employee receives from selling the products is given below:
   1. bicycle - $20
   2. unicycle - $10
   3. tire - $5
   4. pump - $2
   5. chain - $1

As products are sold throughout the day, each salesperson enters in their sales number followed by the number of the product they sold. For example, if salesperson 3 sold a pump, he/she would enter in "3 4". You need to write a program that will continue allowing the users to enter in sales in the given format until " -1 -1" is entered as a value. At this point, the program should print out the total amount of money that the company owes each of the sales people.