CS 215 – Study Questions 3
C++ structs and Sorting

1. What is a struct?

2. What is a constructor?

3. What is sorting?

4. The Swap function has 2 variables. Each variable name is proceeded by an &. What does the & indicate? Why does the programmer need to use the & for this Swap?

5. We implemented the insertion sort to sort in ascending order. How would you modify the insertion sort to sort in descending order?

6. What is the output of the statement:
   ```
   cout << left << setw(20) << "Hello World!" << right << setw (5) << 25 << endl;
   ```
   (use an underscore (_) to indicate a space.)

Use the following struct for a fraction type to answer questions 7 – 10.

```
struct fraction
{
    fraction ();
    int whole;
    unsigned numerator;
    unsigned denominator;
};
```

7. Write the implementation of the constructor for fraction:

   ```
   fraction::fraction ()
   {
   }
   ```

8. Given the following array of fraction objects, write a C++ loop that outputs to the console the whole number portion of the first 15 fractions in the array.
   ```
   fraction somefractions[20];
   ```

9. Given the following array of fraction objects, write a C++ loop that calculates the product of all 20 fractions in the array. store the product in the fraction variable called product.
   ```
   fraction somefractions[20];
   ```
fraction product;

10. Given the following array of fraction objects, write a C++ loop that calculates the sum of all 20 fractions in the array. Store the sum of the fractions in the fraction variable called sum.

    fraction somefractions[20];
    fraction sum;