CST8132 Object Oriented Programming

Exercise 7 – Interfaces, ArrayList, Comparators

Steps:

- Create a new project in Eclipse
- Add three classes:
1. Person (provided)
2. PersonFirstNameComparator (provided)
3. PersonTester

Tasks:

Using a main method within PersonTester:
1. Instantiate an ArrayList<Person> but reference it using List<Person>
2. Add three Person objects to the ArrayList you created in task 1
3. Use a loop to print the three person objects on screen, before sorting
4. Use Collections.sort() with the List and the Comparator provided to sort the Person objects by FirstName
5. Use a loop to print the three person objects on screen, after sorting

Bonus: Define 2 Comparators one to sort by Person last name, a second for age. Then demonstrate using them.

Class Person:

```java
public class Person {
    private String firstName;
    private String lastName;
    private int age;
    public Person(String firstName, String lastName, int age){
        this.firstName = firstName;
        this.lastName = lastName;
        this.age = age;
    }
    public String getFirstName(){ return firstName; }
    public void setFirstName(String firstName){this.firstName = firstName;}
    public String getLastName(){return lastName;}
    public void setLastName(String lastName){this.lastName = lastName;}
    public int getAge(){return age;}
    public void setAge(int age){this.age = age;}
    @Override public String toString(){
        return String.format("%s %s %d", firstName, lastName, age);
    }
}
```

Class PersonFirstNameComparator:

```java
import java.util.Comparator;

public class PersonFirstNameComparator implements Comparator<Person> {
    public int compare(Person p1, Person p2){
        return p1.getFirstName().compareTo(p2.getFirstName());
    }
}
```

Grading Guide (Total Score 10):

ArrayList instantiated correctly?	2
ArrayList referenced by List?	2
Sample Person objects added to ArrayList?	2
Collections.sort() used to sort by First Name with Comparator?	2
Person objects referenced by List output before and after sorting?	2
Bonus?	4
Expected Total	10

Sample Program Output:

```
Before sorting:(firstName, lastName, age)
aaa bbb 1
xyz abc 2
kyj lmn 3
After sorting:(firstName, lastName, age)
aaa bbb 1
kyj lmn 3
xyz abc 2
```