COM S/SE 319 : Construction of User Interfaces
Spring 2020

HW8

[Total Points: 50]

Assignment Due: Wednesday, April 22, 2020, 11:59 PM

Task I: SYSTEM MODELING AND UML DIAGRAMS (30 Points)

Please find below the scenario for the construction of UML diagrams and answer the questions after that.

A Survey Tool is a system used to create a survey over the internet. The Surveyor create a survey for participants to fill out. The tool allows a variety of surveys options from multiple choice or short text. Once the survey is created, the Surveyor must be able to add the emails of the participants and send out the survey. The survey must have an expiration date and time. The survey cannot be modified once the survey is sent out. The respondents may choose to participate in the survey or decline to participate as well. No participant can respond once the survey expires. The participant can request the surveyor to extend the survey which the surveyor must approve. Once the survey has been completed, the surveyor can close the survey and generate a report.

1. **Draw the Use Case diagram mentioning the actors, lines associated with each actor, appropriate use cases and relationship (<<include>>) between appropriate use cases for the above Survey System. (10 points)**

2. **Draw the Sequence diagram with appropriate messages, attributes, activation bar (lifeline, objects are given) for creating a Survey and sending it out for above Survey System. (10 points)**

3. **Draw the Class diagram with appropriate class, attributes, generalization, association, aggregation for above Survey System. (10 points)**

Task II: Testing (20 points)

Given the following method:

```
01 public static double median(double[] d) {
02   double median = Double.NaN;
03   if (d != null && d.length > 0){
04    if (d.length == 1) {
05     median = d[0];
06    } else {
07    Arrays.sort(d);    // sorted ascending
08    int mid = d.length / 2;
09    if (d.length % 2 != 0) {
10          median = d[mid];
11    } else {
12          median = (d[mid - 1] + d[mid]) / 2;
13    }
14    }
15   }
16   return median;
17 }
```

a) Justify: What would be the effect if you replace "**&&**" in line 3 with a "**&**"? (**5 Points**)

b) Create the control flow graph of the method **median(...)**. Please write the source code, references to the line numbers of the method are not sufficient. (**10 Points**)

c) Specify a test suite, which contains a list of test cases (each test cases should have minimum input numbers) which satisfies the statement coverage for the method **median (...)**. Enter the paths that have been traversed. (**5 Points**)

What to Submit:

Submit via Canvas a **pdf** file containing the answers of all the above tasks. Please Make sure diagrams are drawn legibly using UML diagram/ drawing tool.
