CS 314 Safety In-Class Exercise and Post-Class Assessment

Assignment:

You must complete two tasks for this exercise:

Task 1. An **in-class** exercise done in **your team**, turning in the *Results Sheet* in this document at the end of class.

Task 2. An **after class** short writing assignment done **individually**, with the results submitted to Canvas no later than 11:55pm Thurs, May 5, 2016.

The goal of Task 1 is to answer questions related to software engineering principles that might have mitigated the Therac-25 safety incidents. The goal of Task 2 is to evaluate your own learning regarding safety requirements and software engineering best-practices, and practice writing well-constructed, convincing points.

Task 1: Answer questions about the Therac-25 safety incidents

Instructions:

1. Put the names of each person in your group who participated in the in-class activity on the *Results Sheet*. Be sure to turn in this sheet at the end of class to receive credit.
2. Answer the following questions and record you answers on the *Results Sheet*:
   A. *What is the role of shared variables in causing the Tyler accidents (Section 3.5)?*
   B. *What is the role of shared variables in causing the Yakima accidents (Section 3.6)?*
   C. *What is wrong with the relationship between the user interface software and the rest of the Therac-25 software?*
   D. *How would you modify the software architecture, in particular the connection between the user interface and the functional parts of the system? Describe an alternative design.*
   E. *How could agile software development processes (e.g. extreme programming or SCRUM), be used to develop embedded software used to control medical devices while ensuring safety requirements are met?*

Task 2: Personal Learning Assessment

Instructions: Between today and 11:55pm Thursday May 5, write an RSQC2 (recall, summarize, question, connect, and comment) reflecting on the 2 most useful things you learned about the role of software engineering principles in maintaining safety requirements. You need to **R**ecall these points, **S**ummarize them, **Q**uestion something about them, and **C**onnect them to some of your other experiences and provide general **C**omments. Your writing should be 3-4 paragraphs and **no longer than 1 page**, 12 point font.

Submit your writing to Canvas as either a pdf file or you can copy and paste your text into the Canvas text box. You must put your name in your uploaded file or pasted text. **Submissions without a name will not be graded** and you will receive a 0 for this assignment. Other restrictions are that **file formats other than pdf or pasted text will not be graded and submissions longer than 1 page will not be graded.**

Grading: This is a retrospective of your leaning of this topic. Your work will be graded on 2 things. First, if you have thoughtfully addressed the RSQC2 points regarding meeting safety constraints. Second, if you have written well-structured paragraphs that are coherent and make your points.

Results Sheet – DS7 Safety – CS314 Spring 2016

Team Name: _____

Team members present:

_____   _____

_____   _____

2. Answer the following questions:

A.   What is the role of shared variables in causing the Tyler accidents (Section 3.5)?

B.   What is the role of shared variables in causing the Yakima accidents (Section 3.6)?

C.   What is wrong with the relationship between the user interface software and the rest of the Therac-25 software?

D. How would you modify the software architecture, in particular the connection between the user interface and the functional parts of the system? Describe an alternative design.

E. How could agile software development processes (e.g. extreme programming or SCRUM), be used to develop embedded software used to control medical devices while ensuring safety requirements are met?