605.601 - Foundations of Software Engineering

Final Examination

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December 9, 2020

Please answer any five (5) questions. Please type your answers below the question under "Answer".

1. (a) What is a Use Case? Please provide an example.

   (b) Please elaborate on how you describe a Use Case?

   (c) Do you think there is a difference between a Use Case and a User Story? Do you have any preference in using any of them?

   (d) Since you may have used Use Cases in your group projects, can you list one or two benefits or limitations in using the Use Cases?

2. (a) What does design mean to you? What are the major steps in a software design process?

   (b) What does separation of concerns mean to you?

   (c) Are you familiar with the fundamental principles of design? Please list any three principles that you know.

   (d) What does architecture mean to you? Can you describe the relationship between design and architecture?

   (e) Why do we need architecture? Can you describe a basic form of architecture? Please elaborate.

3. (a) What does an architectural style mean to you?

   (b) Do you believe that architectural style can add value to software engineering? And why?

(c) What are the different types of architectural frameworks do you know of? Please provide an example.

(d) How do you analyze an architectural design? Please list the steps.

(e) Why would a software engineer use a partitioned architecture? Please describe in your own words.

4. (a) What is a software component (from a design perspective)?

(b) What are the different views that a component can be presented as?

(c) What does 'refactoring' mean to you? Does the concept of refactoring have any value to you as a software engineer? And why?

(d) What is a design pattern?

(e) How are the design patterns used in software engineering?

5. (a) What is software testing? Describe fault, error, and failure.

(b) Why do you think testing is important for software engineering?

(c) Can you provide an example of software testing? How does software testing impact software development?

(d) Can you describe how software testing can help an entire software development team?

(e) Please define what software tester means to you. What are the different types of software tester you know of? Can a software tester help improve the quality of a software?

6. (a) does 'Agility' mean to you? Do you believe 'Agility' must be a common characteristic of any software today?

(b) is 'Agile' methodology? Do you agree with the Manifesto of Agile software development?

(c) do you define DevOps? Do you see the difference between Agile and DevOps? If so, why? If not, why not?

(d) you had an opportunity to proceed with your group project, which software development approach would you use – Agile or DevOps? Please elaborate.

(e) In a real practice, how would you decide to use waterfall, iterative and incremental, Agile or DevOps? Do you have any preference?