Software Modeling (401016): Resit
June 4, 2015

Instructions:

- Carefully read the text before staring the exam
- No books or reference material is allowed
- No calculator, mobile phones or other electronic devices

Part of this exam is based on the following case study:

Clothing-on-demand is a web company specialized in selling casual clothes online with a novel business model. Indeed, clothes sold by **Clothing-on-demand** can be customized and the website can even suggest particular items to users. Indeed, their website allows to upload a picture of a certain piece of clothing to which the system replies suggesting similar or complementary products in stock that the user may be interested in (e.g., if the user uploads a picture of a red shirt the system may suggest an accessory such as an hat of the same color). Alternatively, the website allows to directly search for specific clothes through an internal search engine. A key feature of **Clothing-on-demand** is that a piece of clothing that is selected by the user can be further customized choosing its color, choosing a piece of text to be printed on the fabric. Users browse the website, add items to a shopping cart, and subsequently proceed to check out by selecting a shipping address and by paying with a credit card. Alternatively to the credit card payment, they can choose to pay directly at delivery time.

Note: this problem description may be ambiguous and incomplete. In answering the questions, you are free to complete it (if needed) and briefly motivate your assumptions.

Theory Questions

1. Illustrate and describe the eXtreme Programming (XP) Software Life Cycle. Also, describe at least two of the five principles behind XP practice. **[1 point]**
2. What requirements prioritization approaches do you know? In what types of SLC models are they typically used? **[1 point]**
3. What is the typical distribution of maintenance activities in the software life cycle? **[0.5 point]**
4. Explain the difference between functional and non-functional requirements. Provide an example for each. **[1 point]**
5. Define procedural abstraction and data abstraction. **[1 point]**
6. Give an example of a type of project in which the Waterfall Software Lifecycle Model would not be a wise choice. Motivate your answer. **[0.5 point]**

Questions related to the case study

7. For the case study, specify the functional requirements with an UML **use case diagram**. Use additional text to describe your model and your assumptions where needed. **[1.5 points]**
8. Complement your specification (in answer of question 6.) with one or more UML **activity diagrams** that model the interactions among a user and the website. **[1 point]**
9. Represent the complete design for the case study with a detailed **class diagram**. Use additional text where appropriate to document your design and motivate your decisions. Ensure consistency with your former specification provided in questions 6 and 7. **[1.5 point]**
10. Discuss which features of the case study could be designed as a service and why. **[1 point]**