

## Homework #1 CS 351 (50 pts)

Date Due: Thursday 9/10

### Question 1 (10 pts)

Provide an example (other than one described in class) of a type of software that would benefit from a prescriptive process model and one that would benefit from an agile process model. Be specific as to the types of models you use.

### Question 2 (10 pts)

- a) A traditional software development company is “changing with the times”, and has hired you to migrate from a prescriptive to an agile process model. Is this possible? What are the tradeoffs? What are the challenges?
- b) Use the prescriptive example you gave in question 1 and provide the high level tasks you would implement to achieve the migration.

### Question 3 (10 pts)

Can you identify any “process patterns” that you would recommend based on the migration you just implemented.

### Question 4 (20 pts)

After visiting with data center engineers at the Hogwarts Central Train Station, the young software engineer wrote down an English description of the software needed by Hogwarts. Read the description below and see if you can identify original requirements. Try to classify the requirements you find into functional and non-functional types.

### **TRAIN TICKET DISPENSING SYSTEM FOR HOGWARTS [1]**

You are required to build a software system to handle the dispensing of tickets at a train station. In this case the ticket dispensing machine can hold only a finite number of coins and bills. The machine stores only information about trains that leave the station in which the machine is located. Each train makes a finite number of stops after leaving the station. These stops are called destinations. Each train has two types of cabins: first class and regular class. The maximum number of seats in each cabin varies across trains. A user of the ticket machine must enter a destination (as a selection), number of tickets required, and the type of cabin requested (only one type of cabin can be selected for the number of tickets

ordered). The machine then checks whether a train that stops at the destination has available space in the type of cabin requested. If there is an available train, the system then reserves the required number of seats and displays the price to the user. The user must then enter payment (restrictions on type of payment are given below). After sufficient payment is entered the system dispenses the tickets. Each ticket contains the train identifier, the cabin type, and a seat number. If insufficient payment is entered the reservation is cancelled.

The machine operates under the following conditions:

- This machine accepts only cash. Only nickels, dimes, quarters, dollar bills and five dollar bills are to be accepted as valid contributions to a payment.
- All other objects are rejected (rejected objects are called slugs).
- The number of coins and bills that the machine can store is limited. Below are the limits:
  - Nickels: maxN
  - Dimes: maxD
  - Quarters: maxQ
  - Dollar bills (1 and 5 dollar bills combined): maxB
- A ticket can only be dispensed if it is available and the payment is sufficient.
- Payment can only be made after a reservation is made on an available train