CSE – 308
Assignment 2

Problem 1: [12 Points]

Consider a company producing a Queue Management System. The components of the Queue Management System are described as follows:

1. Display unit for each of the booths in the service center.
    a. A use ATMega32, Arduino Mega or Raspberry Pi for receiving and processing data from web-based control unit.
    b. The display system could be LCD panel or LED matrix
2. An application to control the display units over the Internet.
3. The communication system for communication between the display unit and controller application
    a. We can think of WiFi connectivity through broadband service or mobile data service
    b. WiFi service requires WiFi module to communicate with the base station
    c. For mobile data we need SIM card for communicating
4. The control unit can control multiple number of display units

You are to implement a web-based system that takes the sales order of the queue management system that selects the following:

- The name of the Queue Management System specified as follows:
    - Deluxe: LCD panel with Raspberry Pi
    - Optimal: Arduino Mega with LED matrix
    - Poor: ATMega32 with LED matrix
- The communication channel
- The number of display units

You have to determine the cost of the total system as well as description of the system. Cost of the following must be considered: processor, display, communication module, web-based controller application, yearly communication cost.

You have to use creational design patterns to demonstrate the above-mentioned web-based system. Do not develop the web-based application here. It is sufficient to demonstrate it through regular input and output command from the prompts.

Problem 2: [8 Points]

Assume that you are trying to implement syntax highlighting in a programming language editor. The editor currently supports 3 languages (C, CPP and Python). To perform this, you need to be able to parse the .c, .cpp and .py source files. Each language has specific rules of parsing. All the parsers implement an interface named Parser which contains all the functions required to parse a file. There is an Interface for the fonts of the source codes. The editor uses Courier New, Monaco and Consolas font for C, CPP and Python respectively. Assume that multiple instances of the editor cannot run simultaneously. The input will be the file name with extension and the output will be the selected font while showing environment and parser name when running parsing method of the editor.

Tasks:

- Identify the design pattern(s) that can best capture the scenario above.
- Implement the scenario in Java