**CSIII: Programming Patterns**

**Lab 9 Assignment:**

**Template Dice, Abstract Car Dealership**

The project is due in one week: by the midnight on the day of the next lab. Make sure to include your name in comments of the source files.

1. **Template Dice.** Using the Templated Method Design Pattern, modify the “templateGame.cpp” example as follows. Add a game of Dice where two players try to get the highest score by rolling five dice up to three times and try to get the maximum score. A single dice roll should be a random number from 1-6. Thus, the minimum score is 5 and the maximum is 30. The first player is the computer. The computer randomly selects whether to roll again or pass and keep the score. The second player is human. The program should print the outcome of the previous round (for both human and computer) and ask whether the human wants to roll again or pass. The game ends either after three moves (rounds) or when both players decide to pass and keep the score. In the end, the program should print the scores and declare the winner (human or computer). Computer wins if the score is tied. Here is an example dialog:
2. Computer rolled: 1 2 3 5 6 = 17, computer's highest score = 17
3. You rolled: 1 2 5 3 1 = 12, your highest score = 12
4. Roll again? [y/n] y
5. Computer rolled: 2 3 1 5 1 = 12, computer's highest score = 17
6. You rolled: 6 7 3 1 5 = 22, your highest score = 22
7. Roll again? [y/n] n
8. Computer rolled: 5 5 5 6 3 = 24, computer's highest score = 24
9. You rolled: passed, your highest score = 22
10. you lose

In the template method example, you should not modify the base class template method, you should only write primitive operations for the new derived class Dice

1. **Abstract Car Dealership.** Consider the code for Abstract Car Factory studied in class. Modify the code as follows: The car buyers may now request a particular model as well as the make a car (randomly selected). the dealer lot may hold up to 10 cars. It is initially empty. If the buyer finds the make and model he likes, he buys it (takes from the dealer lot). Otherwise, the buyer forces the dealer to request a car until the appropriate model arrives. If the wrong make or model is sent, the buyer (not liking it) makes the dealer leave it on the lot. If the lot is full, the buyer goes away (the buyer function terminates).

Specifically, create three new methods of CarLot class called nextCar() and startOver() and lotFull(). First, the carbuyer's function invokes startOver(). Then, the buyer test drives all the cars, until either the buyer finds the make and model he likes or the lot is full.

**Milestone:** Templated dice game.