

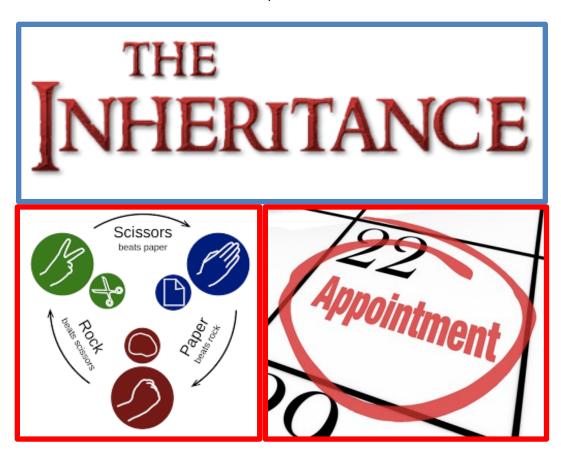
### **Introduction to Programming**

(CS200)

**Shafay Shamail** 

**Inheritance** 

13-April-2018





#### **Lab Guidelines**

- 1. Make sure you get your work graded before the lab time ends.
- 2. You put all your work onto the LMS folder designated for the lab (i.e. "Lab10") before the time of the lab ends.
- 3. Talking to each other is NOT permitted. If you have a question, ask the lab assistants.
- 4. The object is not simply to get the job done, but to get it done in the way that is asked for in the lab.
- 5. Any cheating case will be reported to Disciplinary Committee without any delay.

NOTE: Define a class interface separately and its methods separately. Do not write inline code.

Marks: Name: Roll #:
----------------------

Task 1	1	2	3	4	5		Total
	10	20	10	10	20		70

Task 2	1	2			Total
	20	10			30

Let's Begin.....

Total marks Obtained

/100

# J. LUMS

## **CS 200 Lab 10 Spring 2018**

Task 1: (70)

#### **ROCK-PAPER-SCISSOR**

A: Implement a class called *Tool*.

10

- 1. It should have an integer field called **strength** and a **char** field called **type**. You may make them either private or protected.
- 2. It should also contain the constructor(s), destructor as well as getters and setters for **strength** and **type** and a virtual function **fight**.
- 3. The default value of
- B: Create 3 more classes called *Rock*, *Paper*, and *Scissor*, which inherit from class *Tool*. 20
  - 1. The default constructor will initialize the *strength* to 1.
  - 2. Each of these classes will need a parametric constructor which will take in an *int* that is used to initialize the *strength* field.
  - 3. The constructor should also initialize the *type* field using 'r' for Rock, 'p' for Paper, and 's' for Scissors.
- C: These classes will also need to define the function **bool fight(Tool)** that compares their strengths in the following way:
  - 1. Rock's strength is doubled (temporarily) when fighting scissors, but halved (temporarily) when fighting paper.
  - 2. In the same way, paper has the advantage against rock, and scissors against paper.
  - 3. The function **bool fight()** returns true if the original class wins in strength and false otherwise.
- D: Write a test function to create objects (dynamic) of derived classes using the pointers of base class and verify the results.

You can set the strengths as follow:

Scissors: 5 Paper: 7 Rock: 15

E: Create a class called RPSPlay, which allows a human to play the game against the computer.

20

- 1. Your RPSPlay shall have two **Tool \***, one for human and the other for the computer respectively, because it is not known at the start of the game which tool will be selected.
- 2. The RPSPlay game shall also have three *int* fields to keep track of the number of *human\_sins*, *computer\_wins*, and *ties*.

#### NOTE:

- You may also include any extra auxiliary functions and/or fields in any of these classes.
- Provide overloaded assignment operator for each class.

#### HINT:

You may need to use random number generator to implement some of the functionality in E.



Task 2: (30)

#### **APPOINTMENT BOOK**

A: Implement a base class *Appointment* and derived classes *Onetime*, *Daily*, *Weekly*, and *Monthly*. (4+4+4+4) 20

- 1. An appointment has a description (for example, "see the dentist") and a date and time.
- 2. Create a separate class *Date* to store Date and Time.
- 3. Write getters and setters for the base class.
- 4. Write appropriate constructors and destructors for all the classes.
- B: Write a virtual function *occurs\_on(int year, int month, int day)* that checks whether the appointment occurs on that date.
  - 1. For example, for a monthly appointment, you must check whether the day of the month matches.
  - 2. Write a test function to fill an array of Appointment\* with a mixture of appointments.
  - 3. Have the user enter a date and print out all appointments that happen on that date.

STOP AND SHOW YOUR WORK TO THE TA



Zip your tasks into one folder with format:
YourRollNo-Lab10
example "2001001-Lab10" and upload on LMS before the tab is closed. You will not be given extra time.