Columbia College
Vancouver, Canada

Introduction to Computer Science and Programming 1
CSCI120

Chapter12: OOP

Lab

Note: This document has been designed and developed as part of an initiative for creating an OER (Open Education Resource) package for the course CSCI 120 at Columbia College.

Please contact Alireza.davoodi@gmail.com for any comment, modification, and questions.

Terms of use: Please feel free to customize this document as needed

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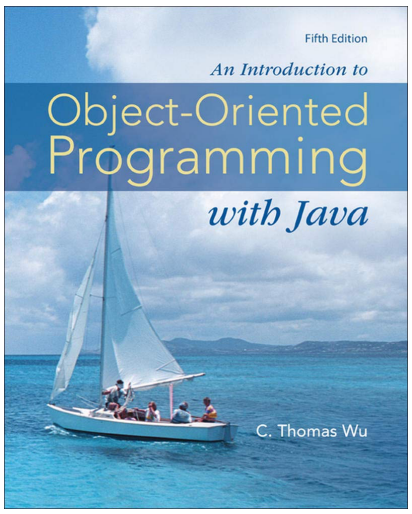
# of Students in the Group:		
Student 1	*First name, last name*	*Student-ID*
Student 2	*First name, last name*	*Student-ID*
Student 3	*First name, last name*	*Student-ID*
Student 4	*First name, last name*	*Student-ID*

Requirements

- Please use meaningful name for your variables and functions
- Try to reuse your solutions as much as possible.

Problem1:

- Create a class and its corresponding properties to model the entities you see in the following images. Then create an object (instance) to exactly show how you represent each entity instance as shown in the pictures:



FAMILY SIZE
RITZ
original
CRACKERS
350 g

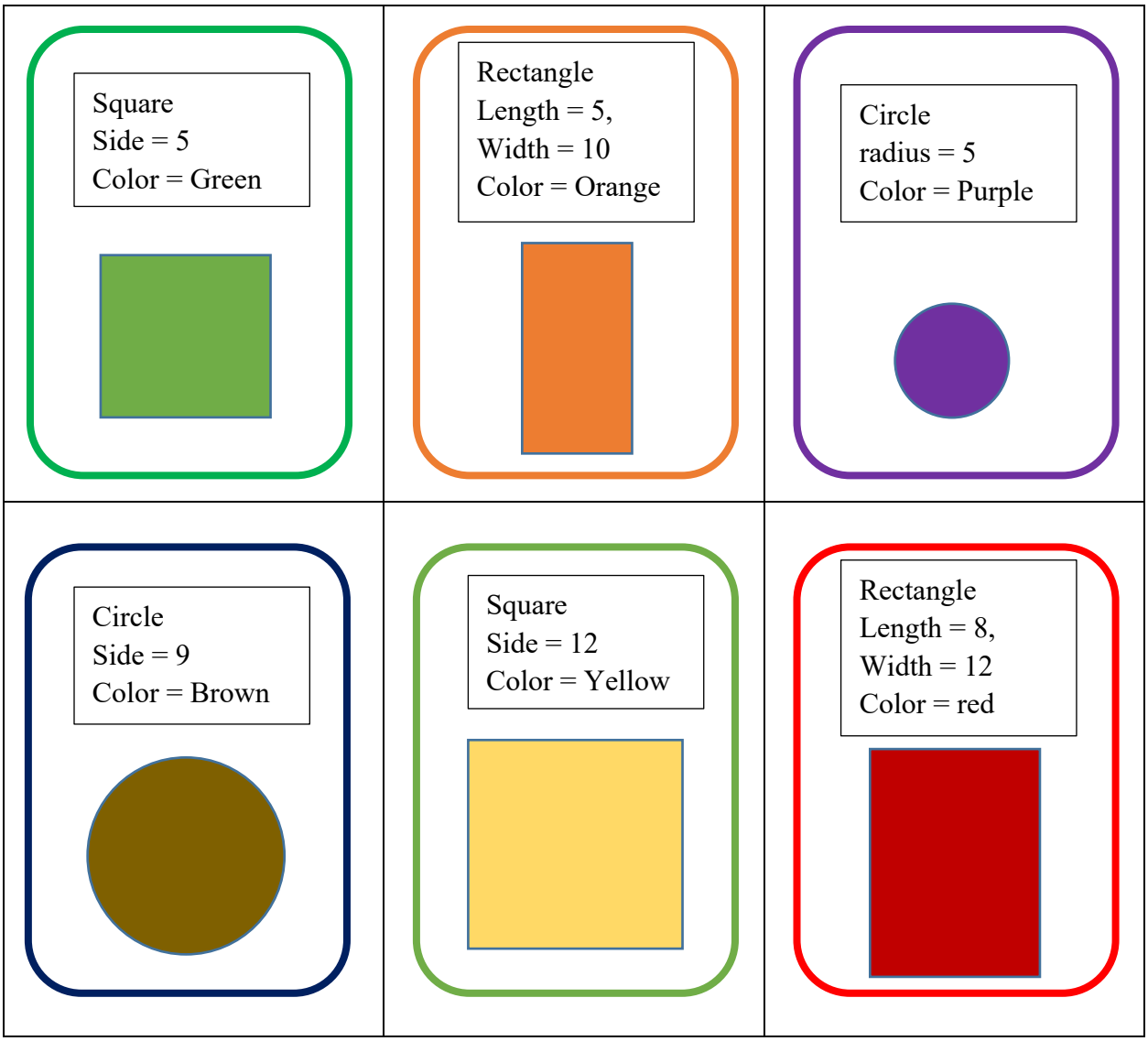
SOFTWARE ESTIMATION
Demystifying the Black Art
McConnell
Professional Software Development
CODE
COMPLETE
2
Second Edition
RAPID
DEVELOPMENT
SOFTWARE PROJECT SURVIVAL GUIDE
Microsoft Press

Problem2:

- Design a class to represent the following form of polynomial function:
  - F(X) = aX^3+bX^2+cX+d
- Define and develop an instance method called fx that receives a number (which is X) as its input parameter and return the result of the function.
- Now create an instance from the class to represent the following equations:
  - 2X^3 -4X^2+5X+1
  - 3X^3+X+2-5
  - X+5
  - -6
- Now call the method *fx* for X=4.

Problem3:

- Note: Do not use Inheritance to solve this problem
- Create a class to represent the following shapes:
  - Rectangle
  - Circle
  - Square
- Create an arbitrary object for each class.
- Now imagine you have a cards package which contains the following cards. Design a class to represent the card package. Also create an instance to model the specific package shown on this image below: (See next page).
- Now, create instance methods to calculate the area and perimeter of each shape.
  - calculateArea
  - calculate Perimeter
- Now add an instance method the CardPackage class to calculate the total area and total perimeter of all the shapes in each package. Call these methods to calculate the total area and total perimeter of the package shown on the next page.



Problem4:

- Solve the same problem 3 using Inheritance and Polymorphism. In your solution explain how you have used Polymorphism and how your solution is different from Problem3.

Problem5:

Design and develop a class that model a multiple-choice question. The question could have 4 or more choices. Out of the choices there are 1 or more correct answers.

- Design and develop a class that represents the above multiple-choice question.
- Design and develop an instance method which receives a list of numbers, which represents the selected answers by the student and returns how many selected answers are correct and how many of them are wrong.

Good Luck ☺