

AP Computer Science



Mr Hanley



Assignment 12/1100₂/14₈/C₁₆ Version: 1.0

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Binary



Ones Comp

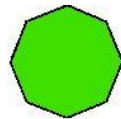


Twos Comp

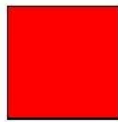


Polymorphism:

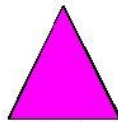
Polymorphism is the ability for different classes to respond to the same message uniquely. It allows for child classes to over-ride an abstract method and define each own actions.



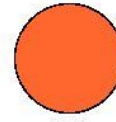
octagon



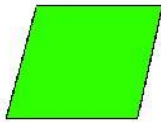
square



triangle



Circle



parallelogram

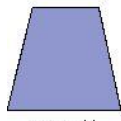
Shapes



cube



oval



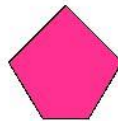
trapezoid



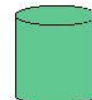
sphere



rectangle



pentagon



cylinder

* Dynamic Memory * Big O Notation * Stacks * Extreme Programming * Selection Sort * Insertion Sort * Waterfall Model

* String * Arrays * ArrayList * Client Server * Artificial Intelligence * Inheritance * Files * Video Games * Short circuit evaluation *

5 different types of projects come to mind when I think of polymorphism:

1. Chess Board Move Enforcement

- a. In a chess game, a user can select a piece and then move it to a different square. For each type of piece the rules differ.
- b. Develop an abstract base class with an abstract method **isValidMove** that verifies if a move is ok for either side in the game of chess
- c. Verify with at least 3 pieces (not including king)
- d. Don't worry about whether the move involves check or not

2. Role Playing Game Adventure

- a. An RPG is ripe for inheritance.
- b. Develop a hierarchy with at least 6 classes
- c. Use an abstract base class with at least one abstract method like act, that subclasses can over-ride

3. Paint Shapes

- a. See below

We will be extending an abstract class Shape by creating some new classes. In the skeleton code project, there are two classes that extend Shape, RectangleV3 and Triangle.

These classes over-ride the abstract method draw.

draw accepts a Graphics object as a parameter. You can use this parameter **g** as a "paintbrush" to draw to the screen.

1. Develop a pentagon class that draws a pentagon to the screen.
 - a. HINT: base your class off of the triangle class
2. Develop a SmileyFace class that extends Shape
 - a. You need a separate outline color and fill color
 - b. You need at least two eyes and a mouth
 - c. HINT: You can use fill arc for a mouth
3. Develop your own unique shape class

4. Quiz Project

- a. Quizzes can have so many different types of questions
 - i. Multiple Choice
 - ii. Matching
 - iii. True/False
 - iv. Fill in the Blank
 - v. Put in order(like the waterfall model steps)
- b. Develop an abstract Question class
- c. Have abstract methods setUpQuestion and evaluateAnswer
- d. Each subclass can do this differently
- e. Probably need a GUI

5. Monopoly Simplified

- a. Provide an abstract base class LandingSpot
- b. Provide an abstract method processLandingSpot
- c. Extend with Property, Chance, Go, Jail, GoToJail
- d. Must have 10 spaces you can land on
- e. Can be two human players

Project 1 Name

Assign 12 – Polymorphic Shapes

Class 1 Name

See Skeleton. lots of juicy stuff😊

Rubric

Pentagon	30
Smiley Face	40
Unique	30
Comments	10
TOTAL	110

*Recursion*Linear Search*Binary Search*Grid World Case Study*File Processing *nlogn*Hangman*