

Question 2

Explain the four principles of object-oriented programming. For each of the principles, describe a piece of work that you have completed for this unit and explain how it demonstrates the principle.

Polymorphism: Polymorphism is the principle of writing code that can work on a super or sub class, this is done by creating an abstract class with abstract methods which can be overwritten by the child class depending on how its used. This can be seen in 4.1 where the rectangle, circle or line (sub class) can be accessed through Shape (super class). In the Shape Drawing class we can Draw Rectangles, Circles and lines using the same code as all these objects are shapes. We also see it in the form of function overloading where a method might need different information to complete a task for example the draw rectangle has 5 required variables to draw the x, y position the width, height and the colour but the exact same function can be used with a 6 variable like alpha which changes the opacity

Inheritance: inheritance is a relationship where a sub class can access attributes from the parent class, this ties in with polymorphism as some objects are similar but not entirely the same so inheritance is used to reuse common trait, in 4.1 this can be seen when rectangle, circle and line inherit properties from shape like the position

Encapsulation: Encapsulation is the principle related to hiding of data by restricting its access by using public or private. In 4.1 we restrict the access to the list of shapes in drawing class by making it private therefore only Drawing can access the shape list. Changes can be made from main but that is done by accessing drawing class public methods

Abstraction: Abstraction is the principle where we can make a where we make the classes that can be used without knowing how it works in 4.1 we can use draw a rectangle to screen using splashkit without knowing how splashkit uses the information to draw the rectangle