PROJECT PLAN FOR FOUNDATION 4

Program 1: Abstraction with YouTube Videos

This program demonstrates abstraction by creating a Video class to track the details of YouTube videos and a Comment class to track comments. The Video class has attributes for the title, author, and length of the video, and methods for getting the comment count and adding comments. The Comment class has attributes for the name and text of the comment. The program allows for the creation of several videos, the addition of comments to each video, and the display of video details and comments.

Program 2: Encapsulation with Online Ordering

This program demonstrates encapsulation by creating classes for Product, Customer, Address, and Order to handle online ordering. The Product class has attributes for the name, product ID, price, and quantity of the item. The Customer class has attributes for the name and address of the customer, and a method for checking if the address is in the USA. The Address class has attributes for the street address, city, state, and country, and methods for checking if the address is in the USA and converting the address to a string. The Order class has attributes for the list of products and the customer, and methods for calculating the total cost, packing label, and shipping label for the order.

Program 3: Inheritance with Event Planning

This program demonstrates inheritance by creating a base Event class and derived classes for different types of events, such as Lectures, Receptions, and Outdoor Gatherings. The Event class has attributes for the title, description, date, time, and address of the event, and methods for generating standard details, full details, and a short description of the event. The Lecture class, Reception class, and OutdoorGathering class are derived classes that inherit from the Event class and have no additional attributes or methods. The program allows for the creation of at least one event of each type, setting their values, and calling different methods to generate marketing messages.

Program 4: Polymorphism with Exercise Tracking

This program demonstrates polymorphism by creating a base Activity class and derived classes for different types of activities, such as Running, Cycling, and Swimming. The Activity class has attributes for the date and length of the activity, and virtual methods for calculating the distance, speed, and pace of the activity, as well as producing a summary of the activity information. The Running class has an additional attribute for the distance run and overrides the get\_distance() and get\_pace() methods. The Cycling class has an additional attribute for the speed of the cycling and overrides the get\_speed() and get\_pace() methods. The Swimming class has an additional attribute for the number of laps swum and overrides the get\_pace() method. The program allows for the creation of different activities, each with their own specific attributes, and the calculation of distance, speed, and pace using overridden methods.