**CMPU 2016 Object Oriented Programming**

TU857-2

2024-25, Semester 1: Python with Sunder Ali Khowaja

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**Lab 4: Inheritance and Method Overriding in Mystery Adventure Game**

**Lab Objective**: In this lab, you will apply the principles of inheritance and method overriding to enhance the structure and behaviour of the mystery adventure game. You will create a new class that inherits from an existing class and override methods to introduce unique behaviour.

**Lab Duration**: 2 hours.

**Lab Instructions**: Complete the following tasks, then answer the lab quiz which requires you to upload your Python file.

**Lab Tasks**:

1. Review and Understand the Existing Code:

* Open the Python code from the previous weeks and ensure you understand its structure, key methods, and classes.
* Use the Pycharm Debugger in order to follow the flow of the programme.

1. Download today’s Python lab file. It contains some code to get you started. Throughout this code you will find lines that say the following where you add your game logic:

*# ---- replace this line with your code ----*

1. Today we are expanding on our classes in the mystery game. Figure 1 illustrates what we are going to build (\_\_init\_\_ methods are considered boilerplate and are not included in this class diagram):

A diagram of a game

Description automatically generated

Figure 1 Class Diagram for Today's Lab

* 1. Create a new Character Class:
  + You have been provided with a Character class.
  + Examine the class.

1. Implement Subclasses for Different Characters:

* Create subclasses (e.g., Suspect, Witness) that inherit from the Character class.
* Think what should go into their \_\_init\_\_ methods. Observe the class instantiation in the code provided to give you a hint.
* Introduce unique attributes and methods for each subclass to represent their roles in the mystery, see Figure 1.
* Remember about the use of super() in order to link to the parent class.
* Add one witness and one suspect class instance into the Game’s \_\_init\_\_ method. This is done the same way as you have added a CrimeScene class instance in the Game’s \_\_init\_\_ method.
* Notice the Witness and the Suspect’s unique methods.

1. Override Methods for Unique Behaviour:

* Override methods from the base Character class in the subclasses to introduce specialized behaviour.
* For example, override the interact method to provide dialogue specific to each character type.

1. Enhance Interaction with Characters:

* Modify the game's interaction logic to involve the newly created Character subclasses. Add their content to the clues that you are gathering throughout the game play.
* Allow players to interact with characters and gather information relevant to solving the mystery. See a script of a game play below.
* Add a method interact\_with\_characters to your Game class to handle this interaction and gather your clues as you go along.

1. Additional Game Play:

* Add the option to choose 3 doors. Door 1 goes to the front door, Door 2 to the library and Door 3 to the kitchen. For this, add a new method called choose\_door to your Game class. This method handles user input and adds clues as you go along.
* Check if a door has already been visited.

1. Test Your Modifications:

* Run the modified code and ensure that the newly introduced characters exhibit their unique behaviour and interactions.

1. Answer the quiz questions and upload your code. This lab is marked. A solution is available from tomorrow on. The solution code will be discussed in the next lecture. Your solution will likely differ from mine. If you fulfil the task description this is not a problem and is to be expected. If you have questions after reviewing the solution please contact me asap via email.

**Example Game Play Output:**

Welcome to 'The Poirot Mystery'

You are about to embark on a thrilling adventure as a detective.

Your expertise is needed to solve a complex case and unveil the truth.

Press 'q' to quit or 's' to start: s

Enter your detective's name: Bianca

Welcome, Detective Bianca!

You find yourself in the opulent drawing room of a grand mansion.

As the famous detective, you're here to solve the mysterious case of...

'The Missing Diamond Necklace'.

Put your detective skills to the test and unveil the truth!

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: c

You continue your investigation, determined to solve the mystery...

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: e

You decide to examine the clues at the crime scene.

You find a torn piece of fabric near the window.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: r

['Torn fabric']

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: e

You've already examined the crime scene clues.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: doors

You decide to choose a door to investigate:

1. Front door

2. Library door

3. Kitchen door

Enter the number of the door you want to investigate: 1

As you approach the front door, you hear a faint whisper... The plot thickens!

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: r

['Torn fabric', 'faint whisper near kitchen']

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: doors

You decide to choose a door to investigate:

1. Front door

2. Library door

3. Kitchen door

Enter the number of the door you want to investigate: 1

You have looked in the front door already.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: doors

You decide to choose a door to investigate:

1. Front door

2. Library door

3. Kitchen door

Enter the number of the door you want to investigate: 2

You open the library door to reveal a hidden passage... What secrets does it hold?

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: r

['Torn fabric', 'faint whisper near kitchen', 'hidden passage behind library door']

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: doors

You decide to choose a door to investigate:

1. Front door

2. Library door

3. Kitchen door

Enter the number of the door you want to investigate: 3

You open the kitchen door. The mansion's chef prepares the evening meal. No clues to the mystery can be unveiled.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: e

You've already examined the crime scene clues.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: i

You decide to interact with the characters in the room.

Suspect Mr. Smith reacts nervously: I was in the library all evening.You notice subtle body language cues indicating potential deception.

Mr. Smith's Alibi: Confirmed by the butler.

Witness Ms. Parker speaks hurriedly: I saw someone near the window at the time of the incident.You sense genuine anxiety and urgency in the witness's words.

Ms. Parker's Observation: Suspicious figure in dark clothing.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: r

['Torn fabric', 'faint whisper near kitchen', 'hidden passage behind library door', 'Suspect Mr. Smith reacts nervously: I was in the library all evening.You notice subtle body language cues indicating potential deception.', "Mr. Smith's Alibi: Confirmed by the butler.", "Witness Ms. Parker speaks hurriedly: I saw someone near the window at the time of the incident.You sense genuine anxiety and urgency in the witness's words.", "Ms. Parker's Observation: Suspicious figure in dark clothing."]

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: i

You have already interacted with the characters. They no longer wish to speak to you.

Press 'q' to quit, 'c' to continue, 'i' to interact, 'e' to examine clues, 'r' to review your clues, or 'doors' to choose a door: q

Process finished with exit code 0