Laboratory Activity No. 9	
Introduction to GUI Development using Pycharm	
Course Code: CPE103	**Program:** BSCPE
Course Title: Object-Oriented Programming	**Date Performed:** 03/22/25
Section:BSCpE – 1A	**Date Submitted:** 02/22/25
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1. Objective(s):

This activity aims to familiarize students with the Pycharm framework for GUI Development

2. Intended Learning Outcomes (ILOs):

The students should be able to:
2.1 Identify the main components in a GUI Application
2.2 Create a simple GUI Application using Pycharm Widgets

3. Discussion:

A Graphical User Interface (GUI) application is a program that the user can interact with through graphics (windows, buttons, text fields, checkboxes, images, icons, etc..) such as the Desktop GUI of Windows OS by using a mouse and keyboard unlike with a Command-line program or Terminal program that support keyboard inputs only.

Pycharm is an integrated development environment used for programming in Python. It provides code analysis, a graphical debugger, an integrated unit tester, integration with version control systems, and supports web development with Django.

4. Materials and Equipment:

Desktop Computer with Anaconda Python or Pycharm
Windows Operating System

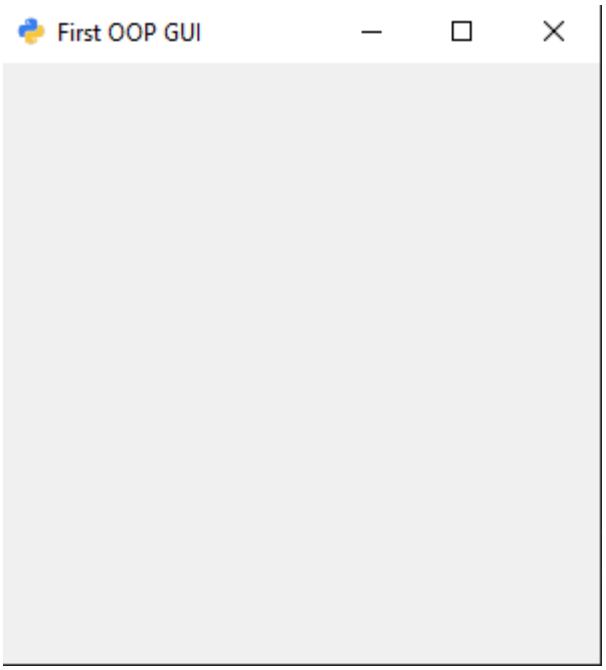
5. Procedure:

```python
import sys
from PyQt5.QtWidgets import QMainWindow, QApplication
from PyQt5.QtGui import QIcon

class App(QMainWindow):

    def __init__(self):
        super().__init__() # initializes the main window like in the previous one
        # window = QMainWindow()
        self.title= "First OOP GUI"
        self.initUI()

    def initUI(self):
        self.setWindowTitle(self.title)
        self.setGeometry(200,200,300,300)
        self.setWindowIcon(QIcon('pythonico.ico')) # sets an icon
        self.show()

if __name__ == '__main__':
    app = QApplication(sys.argv)
    Main = App()
    sys.exit(app.exec_())

```

2. Run the program and observe the output.

Adding an icon

3. Download any .ico picture from https://icon-icons.com/ or any similar sites.
4. Place the icon in your folder (ex. Oopfa1<lastname>_lab8)
5. Run the program again, the program should now have an icon similar to the program below.



Creating Buttons

1. Create a new .py file named **gui_buttons.py** then copy the program as shown below:

```python
import sys
from PyQt5.QtWidgets import QWidget,QApplication, QMainWindow, QPushButton
from PyQt5.QtGui import QIcon

class App(QWidget):

    def __init__(self):
        super().__init__() # initializes the main window like in the previous one
        # window = QMainWindow()
        self.title= "PyQt Button"
        self.x=200 # or left
        self.y=200 # or top
        self.width=300
        self.height=300
        self.initUI()

    def initUI(self):
        self.setWindowTitle(self.title)
        self.setGeometry(self.x,self.y,self.width,self.height)
        self.setWindowIcon(QIcon('pythonico.ico'))

        # In GUI Python, these buttons, textboxes, labels are called Widgets
        self.button = QPushButton('Click me!', self)
        self.button.setToolTip("You've hovered over me!")
        self.button.move(100,70)  # button.move(x,y)

        self.show()


if __name__ == '__main__':
    app = QApplication(sys.argv)
    ex = App()
    sys.exit(app.exec_())
```

2. Run the program and observe the output.
3. Add a new button named button2 named Register to the GUI that will display “this button does nothing.. yet..” when it is hovered.

Creating Text Fields

1. Create a new file named **gui_text.py** and copy the code shown below:

```python
import sys
from PyQt5.QtWidgets import QWidget,QApplication, QMainWindow, QPushButton
from PyQt5.QtGui import QIcon

class App(QWidget):

    def __init__(self):
        super().__init__() # initializes the main window like in the previous one
        # window = QMainWindow()
        self.title= "PyQt Line Edit"
        self.x=200 # or left
        self.y=200 # or top
        self.width=300
        self.height=300
        self.initUI()

    def initUI(self):
        self.setWindowTitle(self.title)
        self.setGeometry(self.x,self.y,self.width,self.height)
        self.setWindowIcon(QIcon('pythonico.ico'))

        # Create textbox
        self.textbox = QLineEdit(self)
        self.textbox.move(20, 20)
        self.textbox.resize(280,40)

        self.show()

if __name__ == '__main__':
    app = QApplication(sys.argv)
    ex = App()
    sys.exit(app.exec_())
```

2. Run the program and observe the error.
3. Add an import QLineEdit to the Pycharm.Widgets import
4. Run the program and observe the output.
5. Add the following code below self.textbox.resize()

```
self.textbox.setText("Set this text value")
```

4. Run the program again then resize the textbox so that it fits in the Window and that its height is just above the written text's height.

Creating Labels

1. Create a new file called **gui_labels.py** and copy the following code below:

```python
import sys
from PyQt5.QtWidgets import QWidget,QApplication, QMainWindow, QPushButton, QLineEdit
from PyQt5.QtGui import QIcon

class App(QWidget):

    def __init__(self):
        super().__init__() # initializes the main window like in the previous one
        # window = QMainWindow()
        self.title= "PyQt Line Edit"
        self.x=200 # or left
        self.y=200 # or top
        self.width=300
        self.height=300
        self.initUI()

    def initUI(self):
        self.setWindowTitle(self.title)
        self.setGeometry(self.x,self.y,self.width,self.height)
        self.setWindowIcon(QIcon('pythonico.ico'))

        self.textboxlbl = QLabel("Hello World! ",self)
        self.textboxlbl.move(30,25)

        self.show()
if __name__ == '__main__':
    app = QApplication(sys.argv)
    ex = App()
    sys.exit(app.exec_())

```

2. Run the program and observe the output.
3. Add the necessary Widget at the import line to make the program run.
4. Center the label by adjusting the parameters of .move(). This is called Absolute Positioning.
5. Create a new label called “This program is written in Pycharm” and place it at the center and below the Hello World!

6. Supplementary Activity:

Task

Questions

1. What are the common GUI Applications that general end-users such as home users, students, and office employees use? (give at least 3 and describe each)

   • Web Browsers like Chrome - Used for accessing websites, searching information, and browsing the internet.
   • Word Processors like MS Word – Used for creating and editing documents.
   • Media Players like VLC – Used for playing music and videos.

2. Based from your answer in question 1, why do you think home users, students, and office employees use those GUI programs?

   - Home users, students, and office workers use these programs because they make tasks easier, faster, and more organized. They provide a user-friendly way to access information, create documents, and enjoy entertainment.

3. How does Pycharm help developers in making GUI applications, what would be the difference if developers made GUI programs without GUI Frameworks such as Pycharm or Tkinter?

   - PyCharm provides tools like code suggestions, debugging, and a structured environment, making GUI development easier. Without GUI frameworks like PyQt or Tkinter, developers would have to create everything manually, which is harder and takes more time.

4. What are the different platforms a GUI program may be created and deployed on? (Three is required then state why might a program be created on that specific platform)

   • Windows– Used for business and personal applications because it is widely used.
   • MacOS – Preferred for creative work like graphic design and video editing.
   • Linux – Used for software development and servers due to its flexibility and security.

5. What is the purpose of **app = QApplication(sys.argv)**, **ex = App()**, and **sys.exit(app.exec_())**?

   • app = QApplication(sys.argv)` – Starts the application.
   • ex = App()` – Creates an instance of the GUI application.
   • sys.exit(app.exec_())` – Runs the application and ensures it closes properly when exited.

7. Conclusion:

In this laboratory, we learned how to create a simple account registration system using PyQt. We applied object-oriented programming to organize the code and used labels, text fields, and buttons to build the interface. The program layout was designed using absolute positioning, ensuring a clear and user-friendly form. We also centered the window on the screen and formatted the text properly. This activity helped us understand how GUI applications work and how to make them more interactive and organized.

8. Assessment Rubric: