| Laboratory Activity No. 9 | |
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| **Introduction to GUI Development using Pycharm** | |
| **Course Code:** CPE103 | **Program:** BSCPE |
| **Course Title:** Object-Oriented Programming | **Date Performed:** March 22, 2025 |
| **Section:** 1-A | **Date Submitted:** March 24, 2025 |
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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

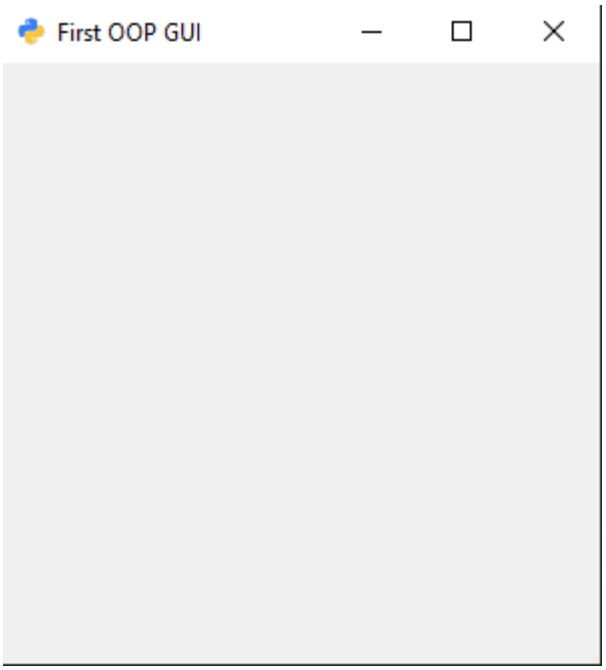
**5. Procedure:**

```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()

```python
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**

Create an Object-Oriented GUI Application for a simple Account Registration System with the following required information: first name, last name, username, password, email address, contact number.

Requirements:

- The GUI must be centered on your screen.
- The GUI Components should be organized according to the order of information required using Absolute Positioning.
- The position of the components should be automatically computed based on the top component.
- All the text fields should be accompanied with their corresponding label on the left side while the text field is on the right side.
- There should a program title other than the Window Title.
- There should be a submit button and clear button at the bottom (submit button on the left, clear button on the right).
- The program should be launched on **main.py** while the GUI Codes should be on a separate file called **registration.py**

## 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)

   Common GUI Application used includes web browsers like Google Chrome for browsing the internet, Word processors like Microsoft Word for creating and editing documents, and video conferencing apps Like Zoom, Microsoft team, or Google meet that used for online meetings, remote learning, and virtual Collaboration.

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

   People use GUI programs because they are user-friendly and intuitive interface making them accessible to non-technical users. It is also visually appealing and interactive, making tasks more efficient and enjoyable.

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 help developers build GUI applications by proiding tools like code completion, debugging, and project management making GUI development easier. Without GUI frameworks like Tkinter and PyQt, developers would manually create interfaces, which is more difficult and time consuming.

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)

   GUI programs can be created and deployed on Windows, macOS, and Linux. Windows is widely used, making it ideal for business application. macOS is preferred by designers and developers for its clean interface. Linux is popular for open-source development and often used for server-based applications.

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

   The line app = QApplication (sys.argv) creates an instance that manages GUI elements. ex = App() initializes the main application window, and sys.exit(app.exec_()) starts the event loop ensures the program runs until the user closes it. This structrure is necessary for handling user interactions smoothly in GUI application.

6. **Conclusion:**

This activity introduced us to creating simple GUI applications using PyCharm. GUI applications make technology easy to use for everyone, including home users, students, and office workers. They help with everyday tasks like browsing the web, writing documents, organizing data, and communication. The way GUI programs are built, including starting the app, creating windows, and handling user actions, ensures they work smoothly. Using GUI frameworks makes development easier and more efficient.

**8. Assessment Rubric:**