

Laboratory Activity No. 9

Introduction to GUI Development using Pycharm

Course Code: CPE103

Program: BSCPE

Course Title: Object-Oriented Programming

Date Performed:

Section:

Date Submitted:

Name:

Instructor:

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:

```

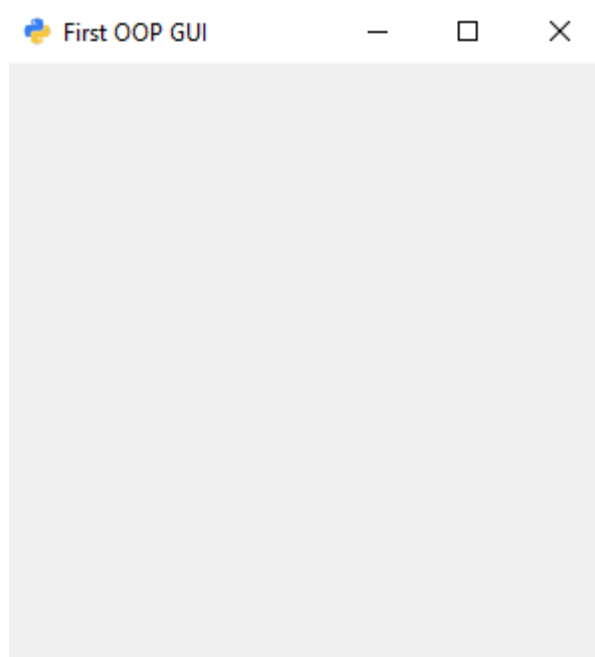
1  import sys
2  from PyQt5.QtWidgets import QMainWindow, QApplication
3  from PyQt5.QtGui import QIcon
4
5  class App(QMainWindow):
6
7      def __init__(self):
8          super().__init__() # initializes the main window like in the previous one
9          # window = QMainWindow()
10         self.title= "First OOP GUI"
11         self.initUI()
12
13     def initUI(self):
14         self.setWindowTitle(self.title)
15         self.setGeometry(200,200,300,300)
16         self.setWindowIcon(QIcon('pythonico.ico')) # sets an icon
17         self.show()
18
19 if __name__ == '__main__':
20     app = QApplication(sys.argv)
21     Main = App()
22     sys.exit(app.exec_())
23

```

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:

```

1  import sys
2  from PyQt5.QtWidgets import QWidget, QApplication, QMainWindow, QPushButton
3  from PyQt5.QtGui import QIcon
4
5  class App(QWidget):
6
7      def __init__(self):
8          super().__init__() # initializes the main window like in the previous one
9          # window = QMainWindow()
10         self.title= "PyQt Button"
11         self.x=200 # or left
12         self.y=200 # or top
13         self.width=300
14         self.height=300
15         self.initUI()
16
17     def initUI(self):
18         self.setWindowTitle(self.title)
19         self.setGeometry(self.x,self.y,self.width,self.height)
20         self.setWindowIcon(QIcon('pythonico.ico'))
21
22         # In GUI Python, these buttons, textboxes, labels are called Widgets
23         self.button = QPushButton('Click me!', self)
24         self.button.setToolTip("You've hovered over me!")
25         self.button.move(100,70) # button.move(x,y)
26
27         self.show()
28
29
30 if __name__ == '__main__':
31     app = QApplication(sys.argv)
32     ex = App()
33     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:

```

1  import sys
2  from PyQt5.QtWidgets import QWidget, QApplication, QMainWindow, QPushButton
3  from PyQt5.QtGui import QIcon
4
5  class App(QWidget):
6
7      def __init__(self):
8          super().__init__() # initializes the main window like in the previous one
9          # window = QMainWindow()
10         self.title= "PyQt Line Edit"
11         self.x=200 # or left
12         self.y=200 # or top
13         self.width=300
14         self.height=300
15         self.initUI()
16
17     def initUI(self):
18         self.setWindowTitle(self.title)
19         self.setGeometry(self.x,self.y,self.width,self.height)
20         self.setWindowIcon(QIcon('pythonico.ico'))
21
22         # Create textbox
23         self.textbox = QLineEdit(self)
24         self.textbox.move(20, 20)
25         self.textbox.resize(280,40)
26
27         self.show()
28
29 if __name__ == '__main__':
30     app = QApplication(sys.argv)
31     ex = App()
32     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:

```

1  import sys
2  from PyQt5.QtWidgets import QWidget, QApplication, QMainWindow, QPushButton, QLineEdit
3  from PyQt5.QtGui import QIcon
4
5  class App(QWidget):
6
7      def __init__(self):
8          super().__init__() # initializes the main window like in the previous one
9          # window = QMainWindow()
10         self.title= "PyQt Line Edit"
11         self.x=200 # or left
12         self.y=200 # or top
13         self.width=300
14         self.height=300
15         self.initUI()
16
17     def initUI(self):
18         self.setWindowTitle(self.title)
19         self.setGeometry(self.x,self.y,self.width,self.height)
20         self.setWindowIcon(QIcon('pythonico.ico'))
21
22         self.textboxlbl = QLabel("Hello World! ",self)
23         self.textboxlbl.move(30,25)
24
25         self.show()
26
27 if __name__ == '__main__':
28     app = QApplication(sys.argv)
29     ex = App()
30     sys.exit(app.exec_())
31

```

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:

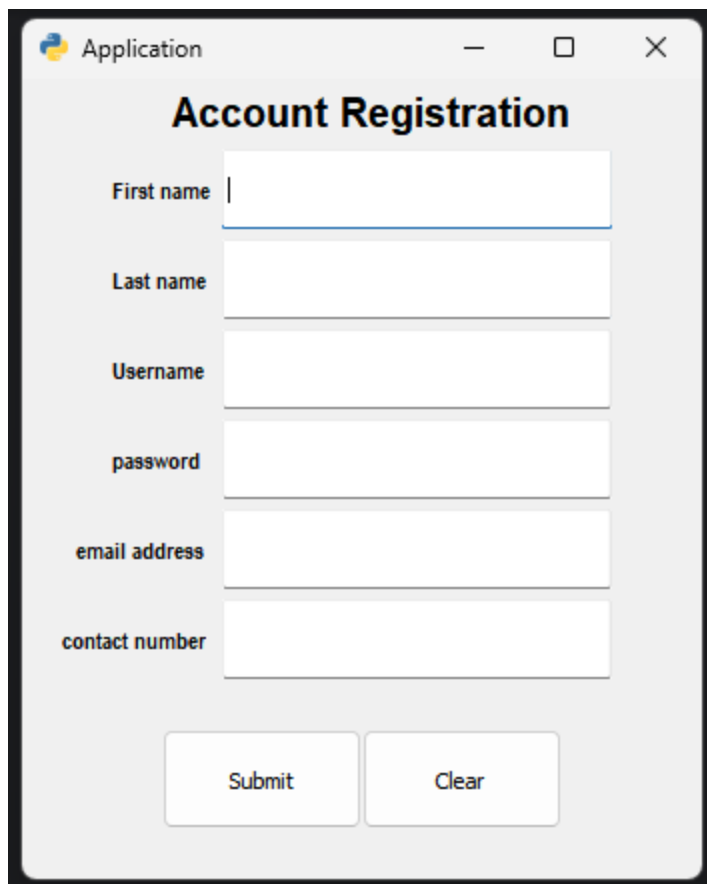
Task

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**

Output:



The screenshot shows a window titled "Application" with standard Windows controls (minimize, maximize, close). The main content area has a title "Account Registration" in bold. Below the title, there are six text input fields, each preceded by a label: "First name", "Last name", "Username", "password", "email address", and "contact number". At the bottom of the window, there are two buttons: "Submit" on the left and "Clear" on the right.

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)

The common Gui Applications that general end-users such as home users, students, and office employees like Microsoft Office Suite, web browsers, and Adobe Creative Cloud. Microsoft Office Suite includes Word, Excel, and PowerPoint, which are used for creating documents, managing data, and making presentations.

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

These programs are popular because they are user-friendly, enhance productivity, and are accessible to people with varying technical skills.

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 helps developers create GUI applications by providing features like code completion and debugging, making the development process easier and more efficient. Without frameworks like PyCharm or Tkinter, developers would need to manually code many details, which can be time-consuming and prone to errors.

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 platforms like Windows, macOS, and Linux. Windows is widely used, macOS is popular among creative professionals, and Linux is preferred for its stability and security.

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

In the code snippet `app = QApplication(sys.argv)`, `ex = App()`, and `sys.exit(app.exec_())`, `QApplication` initializes the application, `App()` creates the main application instance, and `app.exec_()` starts the event loop, allowing the application to respond to user interactions and exit cleanly when done.

7. Conclusion:

In this laboratory activity, we explored the fundamentals of GUI development using PyCharm. By working through various tasks such as adding icons, creating buttons, text fields, and labels, students gained hands-on experience in building and customizing GUI applications. This activity highlighted the importance of using an integrated development environment like PyCharm, which simplifies the development process through features like code completion and debugging. Additionally, students learned about the different platforms for deploying GUI applications and the significance of organizing GUI components effectively. Overall, this activity provided a solid foundation for developing user-friendly and efficient GUI applications, preparing students for more advanced projects in the future.

8. Assessment Rubric: