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| | **Marwadi University**<br>**Faculty of Engineering & Technology**<br>**Department of Information and Communication Technology** | |
| **Subject: Programming With Python (01CT1309)** | **Aim:** Building a Basic User-Interactive GUI Application using Kivy in Python | |
| **Experiment No: 16** | **Date:** | **Enrollment No: 92400133055** |

**GITHUB**

**Aim:** Building a Basic User-Interactive GUI Application using Kivy in Python **IDE:**
Visual Studio Code

Kivy was first released in early 2011. This cross-platform Python framework can be deployed to Windows, Mac, Linux, and Raspberry Pi. It supports multitouch events in addition to regular keyboard and mouse inputs. Kivy even supports GPU acceleration of its graphics, since they're built using OpenGL ES2.

Before using Kivy, you need to install it. You can install it using pip: pip
install kivy

Create a Simple Kivy Application
Let's start by building a basic app with a label and a button.

```
# Importing necessary modules from kivy
from kivy.app import App from
kivy.uix.button import Button from
kivy.uix.label import Label
from kivy.uix.boxlayout import BoxLayout

# Defining the main application class
class SimpleApp(App):     def
build(self):        # Creating a layout
        layout = BoxLayout(orientation='vertical')

        # Creating a label and adding it to the layout
self.label = Label(text="Hello, ICT Department")
layout.add_widget(self.label)

        # Creating a button, binding it to the on_button_press function, and adding it to the layout
button = Button(text="Click Me!")        button.bind(on_press=self.on_button_press)
layout.add_widget(button)

        # Returning the layout to be displayed
return layout
```

```
   # Function to handle button click event
def on_button_press(self, instance):
self.label.text = "Button Clicked!"

# Running the application if
__name__ == '__main__':
   SimpleApp().run()
```

Kivy Login Page Example

```
from kivy.app import App from
kivy.uix.boxlayout import BoxLayout from
kivy.uix.label import Label from
kivy.uix.textinput import TextInput
from kivy.uix.button import Button

# Defining the main application class
class LoginApp(App):     def
build(self):        # Main layout
      layout = BoxLayout(orientation='vertical', padding=10, spacing=10)

      # Username label and input
self.username_label = Label(text="Username:")
      layout.add_widget(self.username_label)

      self.username_input = TextInput(multiline=False)
      layout.add_widget(self.username_input)

      # Password label and input
self.password_label = Label(text="Password:")
      layout.add_widget(self.password_label)

      self.password_input = TextInput(password=True, multiline=False)
layout.add_widget(self.password_input)
```

```
    # Login button
    self.login_button = Button(text="Login")
self.login_button.bind(on_press=self.check_credentials)
layout.add_widget(self.login_button)



    # Label to display the login status
self.status_label = Label(text="")
    layout.add_widget(self.status_label)

    return layout

  # Function to check the credentials
def check_credentials(self, instance):
username = self.username_input.text
    password = self.password_input.text

    # Simple validation (hardcoded username/password for demonstration)
if username == "admin" and password == "password":
      self.status_label.text = "Login Successful"
      self.status_label.color = (0, 1, 0, 1)  # Green color for success
else:
      self.status_label.text = "Invalid Credentials"
      self.status_label.color = (1, 0, 0, 1)  # Red color for error

# Running the application if
__name__ == '__main__':
  LoginApp().run()


Calculator App Using Kivy from kivy.app
import App from kivy.uix.gridlayout
import GridLayout from kivy.uix.button
import Button
from kivy.uix.textinput import TextInput
```

```
# Defining the calculator layout and logic class
CalculatorGrid(GridLayout):     def __init__(self,
**kwargs):         super(CalculatorGrid,
self).__init__(**kwargs)         self.cols = 4  # Grid
layout with 4 columns

    # TextInput field to display the calculation results
    self.result = TextInput(font_size=32, readonly=True, halign="right", multiline=False)
self.add_widget(self.result)


    # Buttons for numbers and operations
buttons = [
      '7', '8', '9', '/',
      '4', '5', '6', '*',
      '1', '2', '3', '-',
      '.', '0', '=', '+'
    ]

    # Adding buttons to the layout
for button in buttons:
      self.add_widget(Button(text=button, font_size=24, on_press=self.on_button_press))

    # Clear button to reset the calculator
    self.add_widget(Button(text="C", font_size=24, on_press=self.clear_result))

  # Function to handle button press events
def on_button_press(self, instance):
    current_text = self.result.text
    button_text = instance.text

    # If the equals sign is pressed, evaluate the expression
if button_text == "=":             try:
        self.result.text = str(eval(current_text))
except Exception:               self.result.text =
"Error"        else:
        # Otherwise, append the pressed button's text to the current expression
if current_text == "Error":             self.result.text = button_text  # Reset the
result if there's an error          else:
            self.result.text += button_text

   # Function to clear the result field
def clear_result(self, instance):
      self.result.text = ""

# Main App class

class CalculatorApp(App):
def build(self):       return
CalculatorGrid()

# Running the application if
__name__ == '__main__':
   CalculatorApp().run()
```

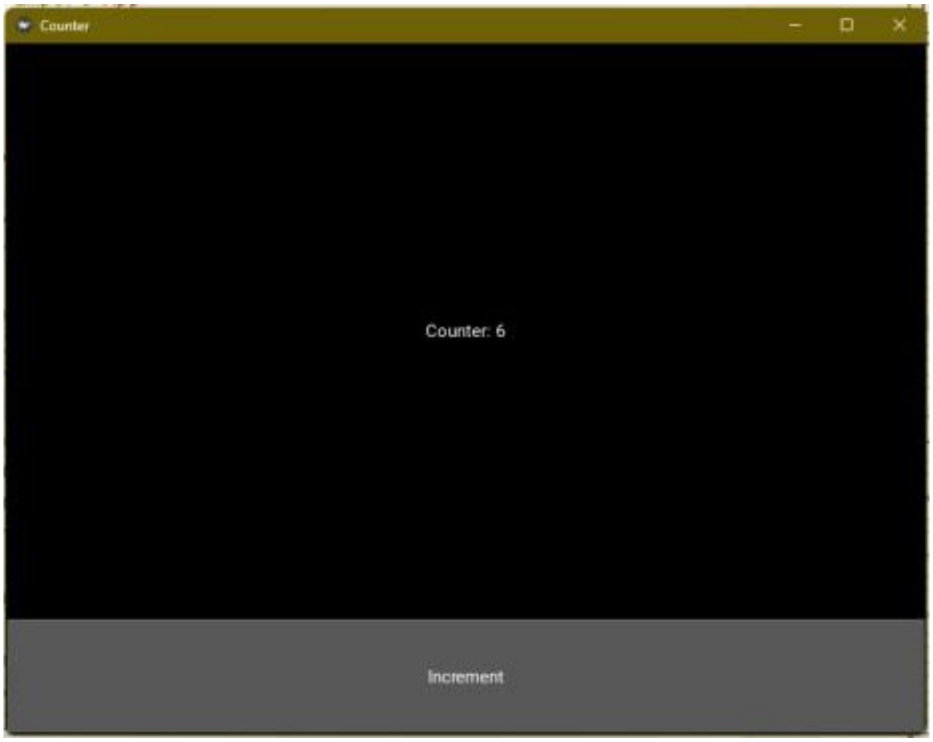
**Post Lab Exercise:**

Design Counter App (This app has a button that increments a counter displayed on the screen every time the button is clicked) Code:

```
#•  Design Counter App (This app has a button that increments a counter displayed on
the screen every time the button is clicked)? # Importing necessary modules from kivy
from kivy.app import App
from kivy.uix.boxlayout import BoxLayout
from kivy.uix.label import Label from
kivy.uix.button import Button class
CounterApp(App):     def build(self):
self.counter_value = 0
        layout = BoxLayout(orientation='vertical')
self.label = Label(text="Counter: 0")
layout.add_widget(self.label)
        button = Button(text="Increment", size_hint=(1, 0.2))
button.bind(on_press=self.increment_counter)
layout.add_widget(button)
         return layout     def
increment_counter(self, instance):
self.counter_value += 1
```

```
        self.label.text = f"Counter: {self.counter_value}" if
__name__ == "__main__":
    app = CounterApp()
app.run()
```

Output:

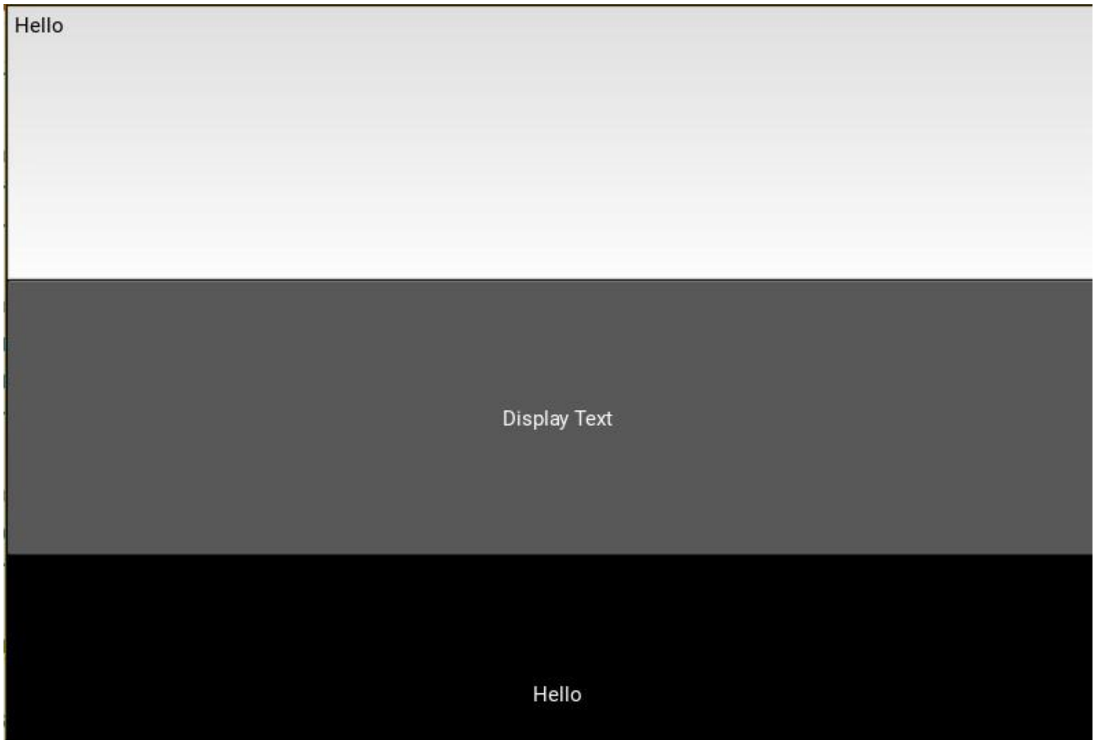


Text Input App (This app allows users to type in a text field and display the typed text on the screen when a button is pressed.) Code:

```
from kivy.app import App from
kivy.uix.boxlayout import BoxLayout
from kivy.uix.textinput import
TextInput from kivy.uix.button import
Button from kivy.uix.label import Label
 class
TextInputApp(App):
def build(self):
        layout = BoxLayout(orientation='vertical')

        # Create text field          self.text_field =
TextInput(multiline=False, hint_text='Type something')
layout.add_widget(self.text_field)

        # Create button          button =
Button(text='Display Text')
button.bind(on_press=self.display_text)
```

```
        layout.add_widget(button)

        # Create label to display text
self.display_label = Label(text='')
layout.add_widget(self.display_label)
         return
layout
     def display_text(self,
instance):         text =
self.text_field.text
self.display_label.text = text
 if __name__ ==
"__main__":
TextInputApp().run()
```

Output:



Hello

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