CSE-565_Project- Project 3: Graphical User Interface Testing Project

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1. **GUI Introduction:**

   a. Version 1

   In this part of the project, I will give you an introduction to the GUI application I created. For Version1, we can see the pictures below. I created a 'First round interview' GUI interface which is a '600x600' pixels size basic information filling GUI application.

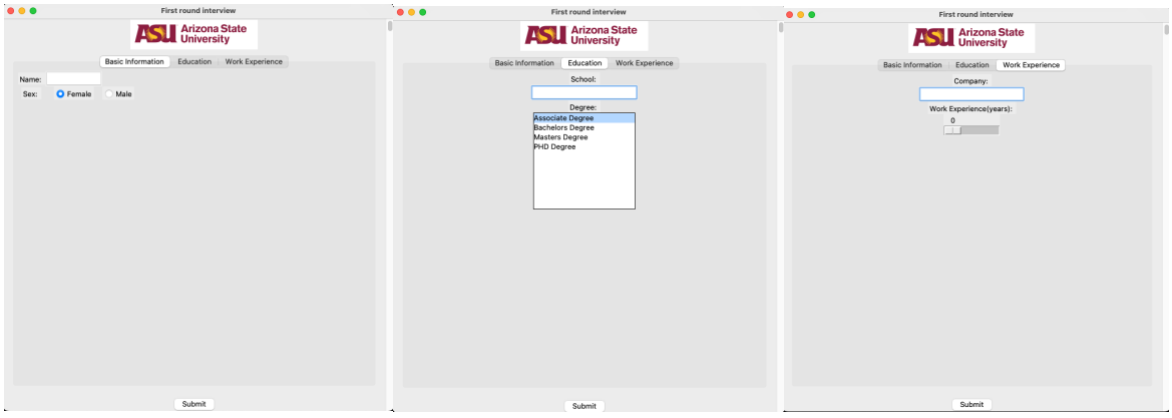
   Overall, for each page, we can notice that I put a title of this application as 'First round interview' on the top of the window so it's quite obvious that we are going to talk about the personal information filling system. In addition, I added ASU image below the title and in the middle of the column. On the bottom of that, there is a 'Submit' button you can press after you finish filling in all the information. On the left side, there is a scroll bar we can slide the pages.

   For more details, if we look a little further down, we can see that there are three pages in total in this GUI interface which are 'Basic Information', 'Education' and 'Work Experience' and we can switch pages between each other.

   For the first page 'Basic Information', we can simply input your name in the text box and select your gender on the radio box.

   Then, we can move on the page 2 'Education' which allows you to input your school's name in the text box and select your degree from the list box.

   Lastly, the 'Work Experience' page provides the function for you to enter your company name and select the working experience on the slider from 0 years to 50 years. Finally, if all the information is successfully filled then you are able to press the 'Submit' button and the data will be sent to the backend system.



b. Version 2

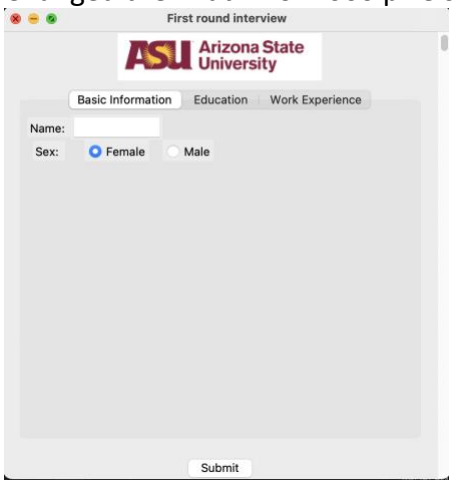
For the Version 2 of the application, there is not much different from the first version and I only slightly modified some layouts to facilitate subsequent testing usage.

Modification1:

Changed the height from 600 pixels to 500 pixels.

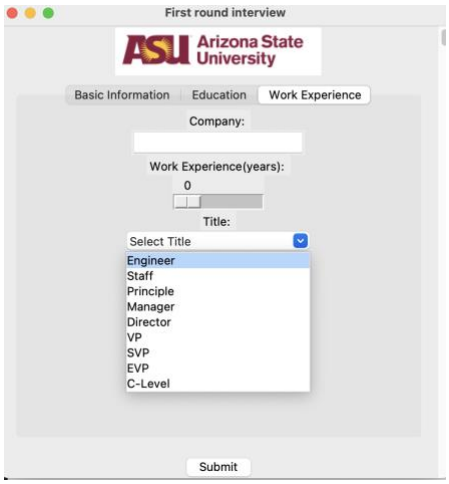
Modification2:

Changed the width from 600 pixels to 500 pixels.



Modification3:

Added new feature ‘Title’ combobox in the ‘Work Experience’ page.



c. Test coverage reports

From the screenshot below, we can see that statement coverage achieve 100% and decision coverage is 93% which are solid coverage percentages.

2. Tools

a. Programming language

For this project, I used Python as a main language. It is widely used and provides various packages for testing and GUI application.

b. Package for GUI

The 'tkinter' package is the standard Python interface to the GUI toolkit which is very easy to use and install. The package management tool I used is Anaconda.

c. Package for testing

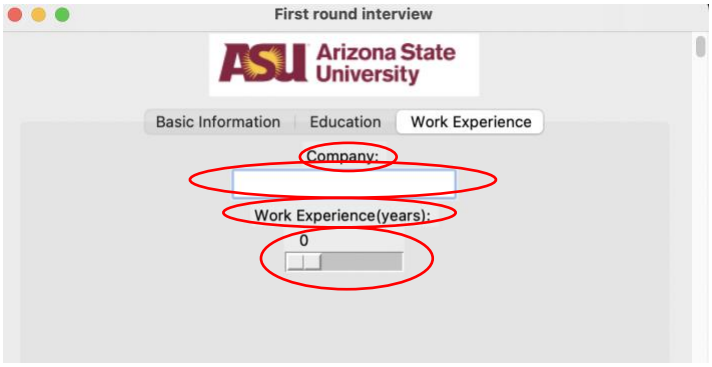
The 'unittest' module is a framework designed to testing code. The module works based on some important object-oriented concepts, and that's why you need to understand the basics of classes and methods in Python.

3. Test cases and results

a. Version 1

The guiTest() object will return the corresponding variables for testing and I created 3 test cases for Version1:

1) Testing for how many GUI elements in third page (Work Experience)
   There are 4 elements in total.

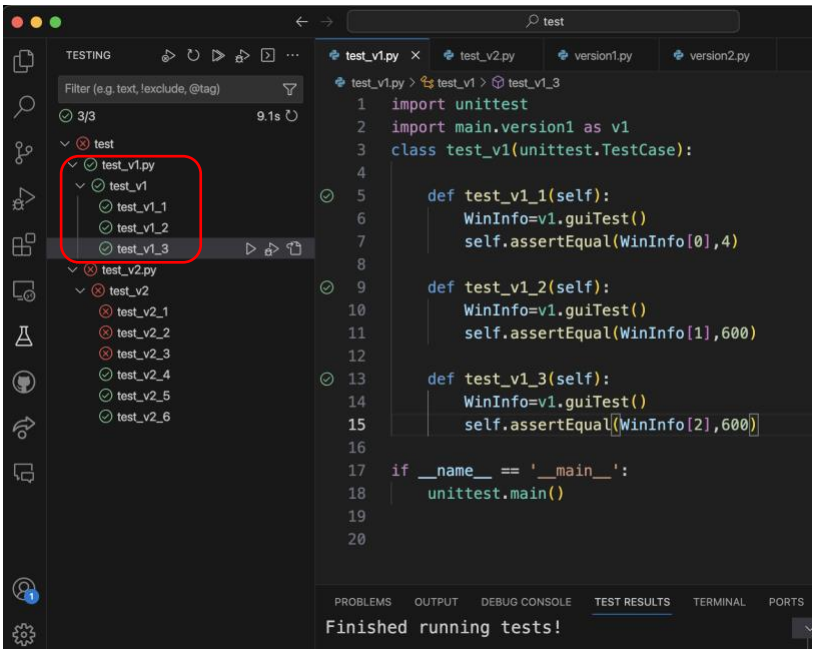


2) Testing for screen height
   The height for Version1 is 600 pixels.

3) Testing for screen width
   The width for Version1 is 600 pixels.

We can see the screenshot below. For these 3 test cases, they are all passed.

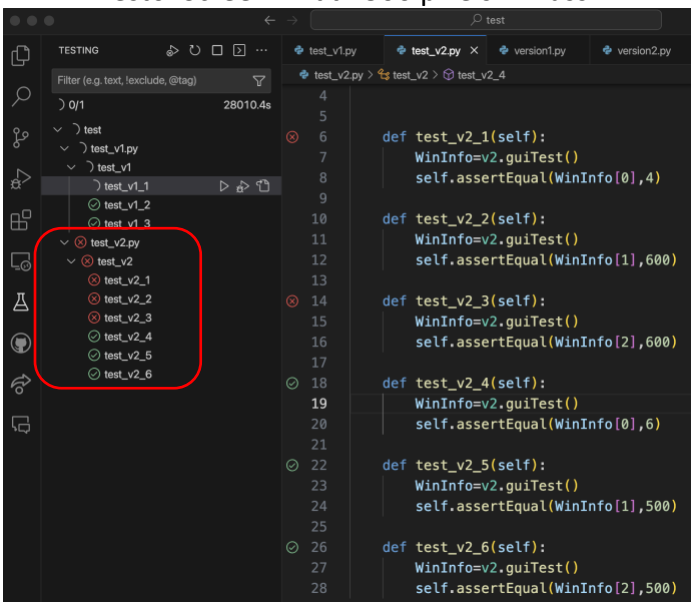
Test1: Number of elements for third page equals to 4 →Pass
Test2: Screen height 600 pixels →pass
Test3: Screen Width 600 pixels →pass



b. Version 2

The guiTest() object will return the corresponding variables for testing and I created 6 test cases for version 2. 3 test cases are passed and the others are failed because I modified the layouts and GUI elements for version 2.

Test1: Number of elements for third page equals to 4 →Fail
Test2: Screen height 600 pixels →Fail
Test3: Screen Width 600 pixels →Fail
Test4: Number of elements for third page equals to 6 →Pass
Test5: Screen height 500 pixels →Pass
Test6: Screen Width 500 pixels →Pass



4. **An assessment of the tool**
   a. Package for GUI: tkinter
      1) Usage:
      It's very easy to use and install. Tkinter provides us wide range of the features to use and we can just simply import the package and call the relative function.

      2) Features and Functionalities
      Most of the basic functions and layouts are similar to Html and Javascript. In addition, the official documents are very clear to descript how to use for every functions

      3) Evaluation
      Overall, I would say it's a tool worth to use and develop GUI application

   b. Package for testing: unittest
      1) Usage:
      It's very widely used in the industry if your project is developed using Python.

      2) Features and Functionalities
      The package provides different assertion judgments to develop test cases. However, the minor flaw is sometimes the package do not synchronize immediately after you modify the code, you need to reopen the Vscode for updates to appear.

      3) Test results
      In the 'TEST RESULTS' section in the button of VScode provides us a fully analysis of the test results in details

5. **Reference:**

   a. Unit testing framework
   https://docs.python.org/3/library/unittest.html

   b. Tkinter- Python GUI interface
   https://docs.python.org/3/library/tkinter.html

   c. Tkinter windows information
   https://wiki.tcl-lang.org/page/winfo%28%29

   d. Tkinter GUI layout
   https://www.pythonguis.com/tutorials/use-tkinter-to-design-gui-layout/