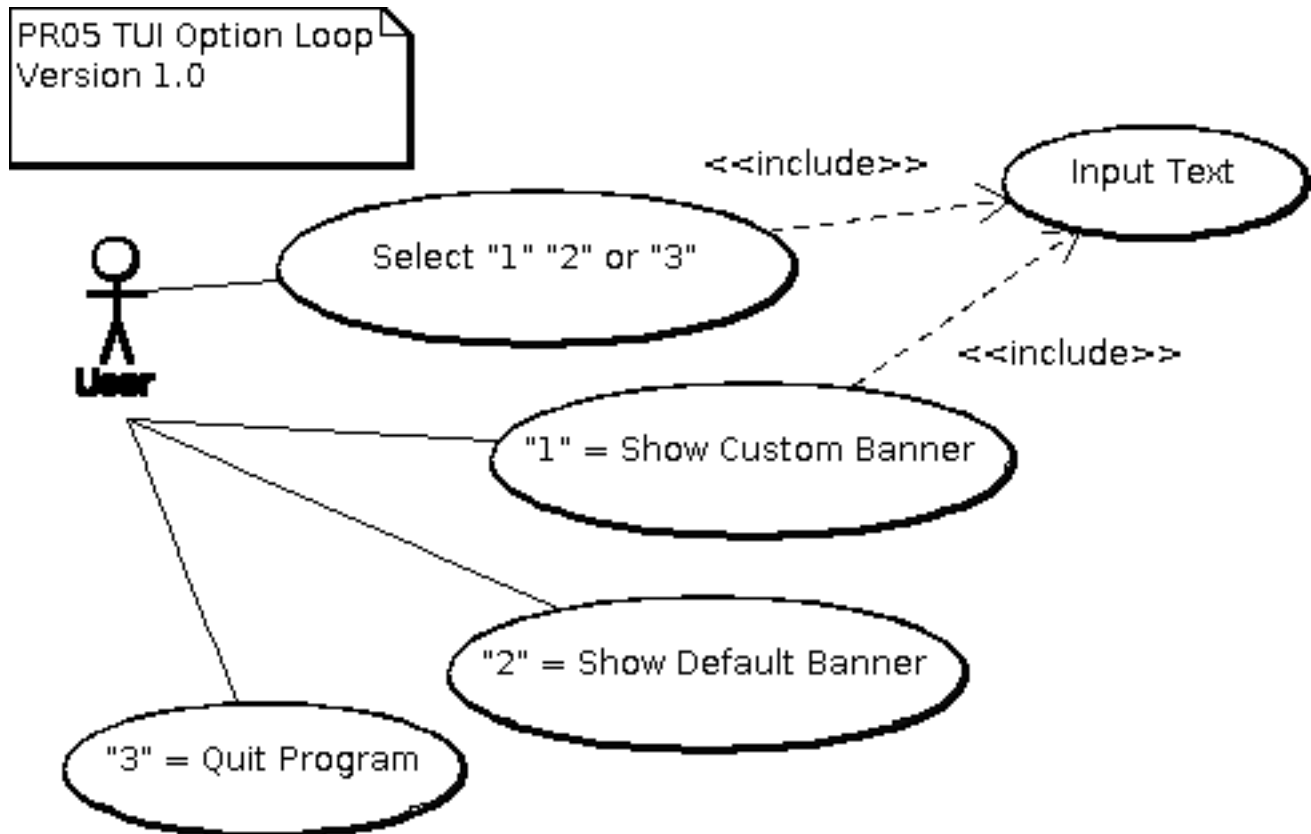


Problem Domain:	Textual User Interface (“TUI”)
Mission Summary:	Create an “Input Option Loop”
Prerequisite:	Completion of “Python 1000” (available at Udemy.com)
Your Script Name:	PR05_MenuChoices.py
Solution Name:	PR05S_MenuChoices.py
Version:	1.0 [Step By Step Edition]

Synopsis

Once activated, Textual User Interfaces can allow users to choose between several options.

In this exercise, we will create a program that will “loop” until a specific option-string has been entered.



Please note that pure string options are to be both collected, as well as used throughout this application¹.

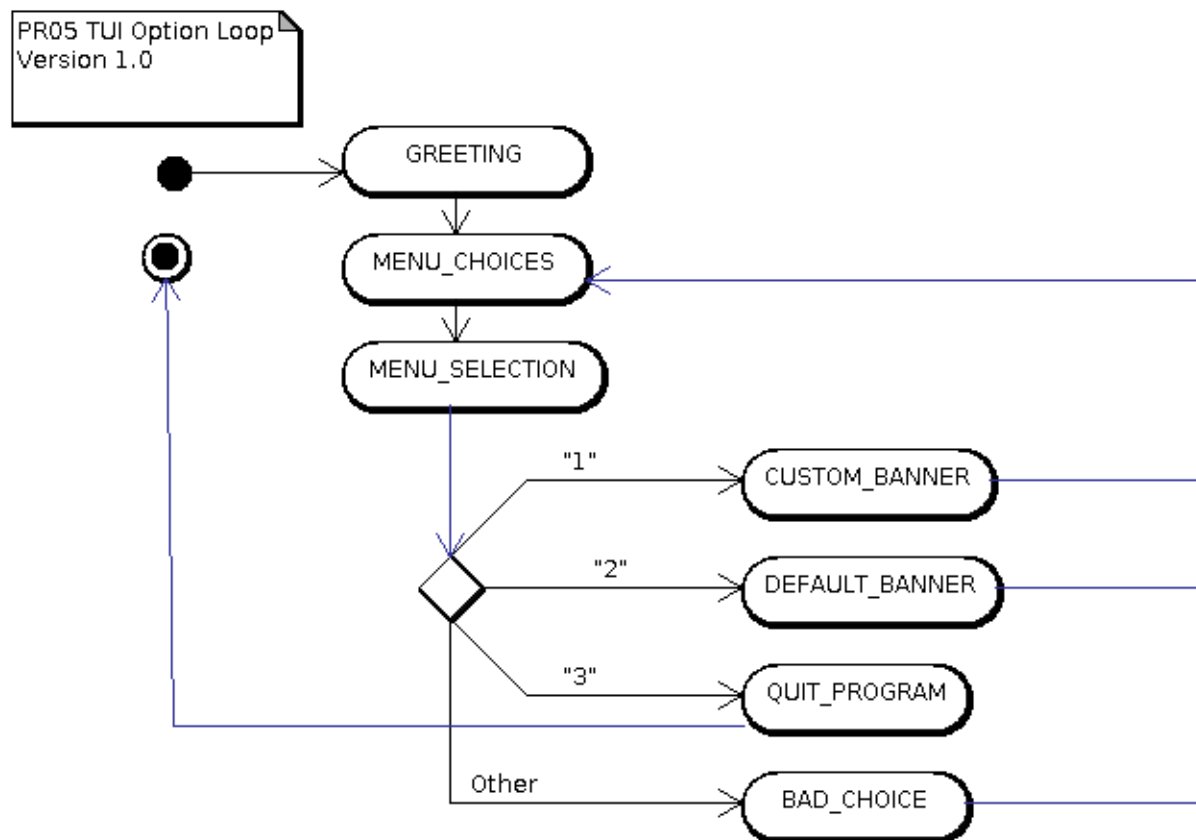
Requirements

- 1) Create a script named PR05_MenuChoices.py
- 2) Review the Activity Diagram located in the “**Related Diagrams**” section below
- 3) Match the following terms & requirements (or “states”) to those in the Activity Diagram:
- 4) GREETING:
 - A) Display “WELCOME to PR05!”

- B) Display three (3) empty lines
- 5) MENU_CHOICES:
- A) Option "CUSTOM_BANNER"
 - 1) Present as option "1.) Display Custom Banner"
 - 2) Allows user to input a custom message to be displayed as a banner
 - B) Option "DEFAULT_BANNER"
 - 1) Present as option "2.) Display Default Banner"
 - 2) Allows user to display "Hello User!"
 - C) Option "QUIT_PROGRAM"
 - 1) Present as option "3.) Quit Program"
 - 2) Allows user to quit the program / break the main loop
 - D) Condition "BAD_CHOICE"
 - 1) The entry of any other text shall display the message "Bad Choice"
 - 2) The BAD_CHOICE message shall be displayed upon a single line
 - 3) After the BAD_CHOICE message has been displayed, the program will re-display (loop to / resume) the MENU_CHOICES operation
- 6) MENU_SELECTION:
- A) The user need only input "1", "2", or "3" followed by the "enter" key
 - B) The use of the enter key is required
- 7) BONUS
- A) Re-use one of the BANNER functions created for Python 1000
 - B) Change CUSTOM_BANNER to display the current date & time as a banner

Related Diagrams

The main Activity Diagram depicts a graphical summary of the requirements, as well as a reasonably demonstrative operational overview:



BONUS SECTION: Step By Step Instructions

We encourage more advanced students to attempt to complete this activity using the above requirements documentation. The following instructions are provided for those who need a little more experience in programming from requirements.

Incremental Approach

Detailed designs often leave new students feeling overwhelmed. Yet the best way to walk a mile is to take one step at a time!

Let's break the above requirements into a series of smaller challenges:

- 1.) While Challenger
 - a. Use the "while" keyword
 - b. Use "while" to "loop over"
 - i. An indented "block"
 - ii. Asking for input from the user
 - c. Break out of the "loop" when "3" is input
 - d. Test your solution. Verify that:
 - i. Inputting "3" exits the "while" loop
 - ii. Inputting anything else will not
- 2.) Display Challenger
 - a. Update the above to display the list of MENU_OPTIONS
 - b. Test your solution. Verify that:
 - i. Each option is displayed
 - ii. Your "while loop" works as required
- 3.) Control Challenger
 - a. Update the above to process MENU_SELECTIONS
 - b. Ignoring the banner requirement for now:
 - i. Use print() to display the default message
 - ii. Use print() to display your input
 - iii. Use print() to display an appropriate exit message
 - c. Test your solution. Verify that:
 - i. The "while loop" works as before
 - ii. The CUSTOM_BANNER, DEFAULT_BANNER, and QUIT_PROGRAM messages will display (not banner!) their messages, as required
- 4.) Banner Challenger
 - a. Use what we learned in Python 1000 to create a "Banner" function
 - b. Replace the above BANNER print() displays with calls to the "Banner" function
 - c. Verify that:
 - i. The "while loop" works as before
 - ii. The CUSTOM_BANNER, DEFAULT_BANNER, and QUIT_PROGRAM now BANNER the menu choices, as required
- 5.) Menu-List Challenger (optional)
 - a. If you have not already done so, re-factor your solution to:
 - i. Keep all options in a list
 - ii. Display each option from the list
 - b. Verify that your program works as expected
- 6.) Input Test Challenger (optional)
 - a. Update your list of menu-option strings to be a list of tuples
 - b. In addition to the menu-option string, include and display the menu item's

- number
 - c. Update your code to use the menu-items number for input comparison
 - d. Verify that your program works as expected
- 7.) State Machine Challenge (optional)
- a. Define functions to manage CUSTOM_BANNER, DEFAULT_BANNER, and QUIT_PROGRAM
 - b. Update your menu-tuple to include each function definition
 - c. Call each functions in response to the proper input
 - d. Verify that your program works as expected
- 8.) Discussion
- a. What is the advantage / disadvantage of using a state machine?

i In order to avoid type-conversion errors / exceptions, the conversion from textual input-strings to other types (int, etc.) is NOT to be used. The use of Exceptions will be covered in Python 2000.