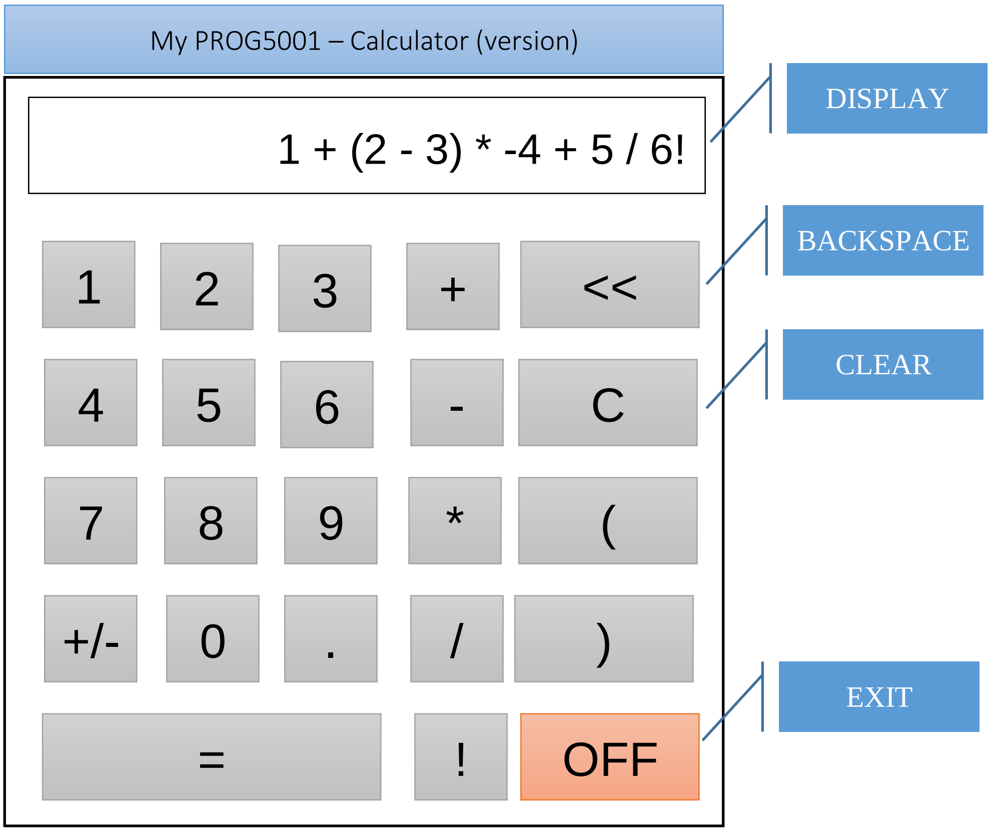
Southern Cross University

Faculty of Science and Engineering

Unit	Fundamentals of Programming
Unit code	PROG5001
Assignment 2	Object Orient Programming Fundamentals
Mode	Individual assignment
Due Date	Refer to the learning site
Learning Outcomes	LO2, LO5
Graduate Attributes	GA4
Weight	30% of overall unit assessment
Suggestion	This assignment is developmental and cumulative. You are strongly advised to start doing this assignment from Week-2 in your study. Leaving your starting date to the week before the due date is a very poor strategy for success in the unit. Follow the provided marking guidelines to help you successfully direct your efforts.

1. Graphical User Interface Design (25 marks)

In this task you will design the following GUI for your Calculator program.



As a user, I want:

- The Calculator program to have the GUI as shown above (20 marks)
- The GUI is sizeable i.e. the buttons and the display could change their size/position to adapt with the frame layout. (You can choose to fix the layout aspect ratio well as the minimum width and height of the GUI to avoid broken layout and maintain the Calculator look and feel.) (5 marks)

2. Program Logic Implementation (60 marks)

As a user, I want:

- To enter, edit and evaluate an expression using the GUI buttons. In particular, Buttons [0-9] are used to enter the corresponding digits. Button [+/-] change the sign of a number. Button [<<] will delete the right most character of the expression. Button [C] will delete the whole expression and clear the display. Buttons [+,-,*,/,!] will represent the addition, subtraction, multiplication, division and factorial operators. Buttons [(,)] enable to set the order of evaluation for the expression. Button [=] will evaluate the expression. Button [OFF] will turn off the calculator and exit the program. (30 marks)
- Evaluate simple expressions with only 1 operator and positive numbers only e.g. 1+2. (10 marks)
- Evaluate complex expressions with multiple operators and brackets. The order of evaluation in this case is: (10 marks) - *difficult*
    - Expression parts inside brackets ( ) will be evaluated first
    - Operators [!,*,/] will be evaluated first and [+.-] will be evaluated after.
- The expression will be checked for incorrect syntax and the user will be notified by highlighting where the syntax is incorrect. The following are examples of incorrect syntax (10 marks): - *difficult*
    - 1 + * 2: two consecutive operators
    - 1..3 + 2: invalid number

3. Coding Standard and Documentation (15 marks)

As a user I want:

- The program is managed using GitHub (5 marks)
- The program source code follows the below coding standard: (5 marks)
    - Each class and method should have comments showing what it does. The method comment should explain the parameters and return if any.
    - Use meaningful and understandable names for variables.
    - Local variables should be named using **camel case** lettering starting with

small letter (e.g. localData) whereas Global variables names should start with a capital letter (e.g. GlobalData). Constant names should be formed using capital letters only (e.g. CONSDATA).

    - Method/function names must describe the reason of using the function clearly and briefly.
    - Method/function names should be written in camel case starting with small letters e.g. performCalculation().

- A video to show how to use the calculator program. You need show and introduce yourself on the video with the name, student-id (5 marks).

Submission

You are required to submit the following documents:

- The Calculator BlueJ project for Task 1 and 2
- YouTube link to the video for Task 3

Original work

It is a University requirement that a student's work complies with the Academic Policy, Chapter 4.20 on Student Academic Integrity. It is a student's responsibility to be familiar with the Policy.

Failure to comply with the Policy can have **severe consequences** in the form of University sanctions. For information on this Policy please refer to Chapter 4.20 on Student Academic Integrity at the following website:

http://www.scu.edu.au/governance/academicboard/policy/

As part of a University initiative to support the development of academic integrity, assessments may be checked for plagiarism, including through an electronic system, either internally or by a plagiarism checking service, and be held for future checking and matching purposes.

Retain duplicate copy

Before submitting the assignment, you are advised to retain electronic copies of original work. In the event of any uncertainty regarding the submission of assessment items, you may be requested to reproduce a final copy.

School Extension Policy

In general, I will **NOT** give extension unless where there are exceptional circumstances. Students wanting an extension must make a request at least 24 hours before the assessment item is due and the request must be received in writing by the unit assessor or designated academic. Extensions within 24 hours of submission or following the submission deadline will not be granted (unless supported by a doctor's certificate or where there are exceptional circumstances – this will be at unit assessor's discretion and will be considered on a case by case basis). Extensions will be for a maximum of 48 hours (longer extensions supported by a doctor's certificate or alike to be considered on a case by case basis).

A penalty of 5% of the total available grade will accrue for each 24-hour period that an assessment item is submitted late. Therefore, an assessment item worth 20 marks will have 1 marks deducted for every 24-hour period and at the end of 20 days will receive 0 marks.

Students who fail to submit following the guidelines in this Unit Information Guide will be deemed to have not submitted the assessment item and the above penalty will be applied until the specified submission guidelines are followed.

Marks and Feedback

All assessment materials submitted during the semester will normally be marked and returned within two weeks of the required date of submission (provided that the assessment materials have been submitted by the due date).