



ARAB ACADEMY FOR SCIENCE, TECHNOLOGY AND MARITIME TRANSPORT
COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING

Course Code	:	CC215
Course Name	:	Data Structures
Course Instructor	:	Dr. Ashraf Tammam
Course T.A.	:	Eng. Nour S. Eissa

Course Project Description

Overview

The objective of this project is to familiarize yourself with the concepts and important skills that you have learnt so far in the CC215 Data Structures course, which are abstract in nature.

This project will be graded out of 10 MARKS and any failure in following the submission guidelines will negatively impact your grade.

The project should be delivered by the 29th of March 2022 (6th week). **A maximum of 4 students** are allowed to be enrolled in the same project. The deliverable tasks will vary according to the number of students enrolled in the project, which will be explained further on in this documentation.

Project Description

You are required to develop a calculator based **on the stack abstract data type**. The calculator application must meet the following requirements: -

- 1) Must accept an infix expression **from the user**, with a maximum size of **256 characters**.
- 2) The application must **convert the infix expression to a postfix expression (using stack)** and **display the postfix expression on the screen**.
- 3) The application must **evaluate the postfix expression (using stack)** and **display the final result on the screen**.
- 4) The calculator must be able to deal with the following operators: $^$ $*$ $/$ $+$ $-$ $()$
- 5) The calculator must be able to detect errors in the input expression and display an error message to the user.

Technical Requirements

Your project must be developed using the C/C++ programming language on **Microsoft Visual Studio 2017 (or higher)** and it must adhere to the following requirements.

- 1) The project must be configured as a Console Application, unless otherwise permitted by your instructors.
- 2) Your project must be able to run on Microsoft Windows OS.
- 3) Your project must be free of any syntax errors during submission. Projects submitted with syntax error will receive **ZERO** as a grade, and will not be disputed, appealed, or entertained.
- 4) The calculator application only needs to handle single digits operands and only deal with integer inputs. However, the output must include floating point if required. (e.g. $1/2=0.5$, etc.) **(This criterion is only applicable for projects in which a maximum number of 3 students are enrolled)**. In case 4 students are enrolled in the project, the calculator must be able to handle multi-digit operands and floating point operands as well.

Teamwork Policies

- 1) You are allowed to team up with any of your colleagues taking the CC215 data structures course, even if they are registered in different classes. However, **make sure you will be able to join them at their class during the discussion time. If you cannot join/receive your team member from other classes during your discussion session, then you are not allowed to team up with them.**
- 2) Each team member must **exclusively select and work on ONE** of the below tasks.

SN#	Task	Description	Perceived weight
1	Helping functions and stack structure	<ul style="list-style-type: none">• Develop the required stacks• Write all the required functions other than the conversion and evaluation functions. (etc. isDigit, Priority check, etc.)	30%
2	Infix to Postfix Conversion	Write the required function to convert from the infix expression to the postfix expression.	35%
3	Postfix expression evaluation	Evaluate the postfix expression to calculate the final result.	35%
4	Support for multi digits operands and floating-point.	Work with the team members to add the ability to handle multi digits operands and floating-point operands.	20% and sets the perceived weights for task 2 and task 3 to 25% .

Deliverables

A .PDF Documentation including the following:

- a. **First Page:** Names and academic IDs of all team members along with the classes they are enrolled in.
- b. **Second Page:** Tasks assigned to each team member and declarations of any assistance they gave or received throughout the project.
- c. **Third Page:** The full code for the project.

Grading Strategy

- **Each student working on the project will undergo a short discussion session with their instructors,** which will decide the student's grade. The project itself is graded out of **2 MARKS** which will be given to all team members according to the evaluation of the submitted code. The other **8 MARKS** will be assigned to each individual student according to the outcome of their discussion sessions.
- A maximum similarity index of **50% is allowed** (*according to the perceived weight shown in the table above*), given that the students properly cite their references and acknowledge the complete comprehension of the contents they incorporate in their task. Students are allowed to seek help from the internet, other colleagues, or their instructors.
- Helps received from team members must be declared as well.

Plagiarism Penalty

Receiving or giving any codes without a clear and proper reference will result in the cancellation of your project, along with faculty board disciplinary actions. You must clearly state any help that you **gave/received** while working on the project, either from a person or from digital sources. Failing to do so will result in a grade of **ZERO** for all team members involved in the project.