	Air University - Aerospace and Aviation Campus, Kamra **Department of Computer Science**

Programming Fundamental (CS111)
Assignment # 04

[CLO-3, Taxonomy Level-C3, PLO-3]

Course: BSCS-1 **Semester: 1st (**Fall 2023)

Due Date: 20/12/2023 **Total** Marks**:** 30

Instructions

1. *Plagiarism, copy & past material will lead to the cancellation of your assignment.*
2. *Write your* Name, Reg# on the first page (title page) of your submission.
3. No late submission

These problem statements involve a combination of file I/O, arrays, functions, and exception handling in practical scenarios.

Q.1 **Solve** each of the following scenarios and provide a C++ program by utilizing functions, File I/O, and Exception handling,
(the code must have proper indention and comments)

1. Write a calculator program that performs basic operations (addition, subtraction, multiplication, division). Implement exception handling to handle division by zero and invalid user inputs. Allow users to input mathematical expressions. (05)

2. Write a program that performs matrix operations (addition, subtraction, multiplication) using arrays. Implement exception handling to address scenarios like incompatible matrix sizes or invalid user inputs. Allow users to input matrices and choose the operation. (05)

3. Write a program that reads temperatures from a file, converts them between Celsius and Fahrenheit, and stores the results in an array. Implement exception handling to address invalid temperature values and allow users to specify the input file. (05)

4. Write a program that reads passwords from a file, validates them based on certain criteria (e.g., length, special characters), and stores valid passwords in an array. Implement exception handling to handle invalid passwords and display a summary of valid passwords. (05)

5. Write a C++ program for managing a student database. Implement file I/O to store student records and exception handling to address issues like file corruption or invalid data formats. Allow users to add new students, display student details, and search for students by ID. (10)