**University of Michigan – Dearborn**

**CIS 200 – Computer Science 2**

**Lab# 1**

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# Question 1

## Source Code

The source code for this question has been uploaded to Canvas as Lab\_1.cpp.

## Description

This program manages student records, it stores each student’s ID, name, date of birth and grade in a structured format.

## Validation

* ID : must be an integer which is greater than 0
* Name : Ensure that the name is not empty and contains only alphabetic characters and spaces.
* Date of Birth : Follow DD/MM/YYYY format and represent a valid date
* Grade : Ensure the grade is from 0 to 100

## Structures

* Define a Date structure with day, month, year (int)
* Define a Student structure with fields for ID(int), name (string), dateOfBirth (Date structure), and grade (float)

## Arrays

* Use an array named stu to store up to 5 student records, each represented by a Student structure.
* Data storage block : Store valid inputs in the array of Students records
* Output handling block : Output the details of students’ records, max, min and average grade of all students.

## Screenshots

A black screen with white text

Description automatically generated

# Design

Declare variables

struct Date

struct Student

User inputs details

Program call functions to output details

Program calls functions to calculate and output average, max and min grade

# Testing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test # | Input value | Expected output | Actual output | Test Pass/Fail |
| 1 | Student 1 : 12345, Albert, Smith, 01 02 2005, 85  Student 2 : 98765, John, Doe, 10 25 2015, 90  Student 3 : 11223344, Jay, Scott, 01 25 2018, 97  Student 4 : 998877, Joe, Albert, 12 05 2005, 98  Student 5:  123321, Mike, Alex, 05 08 2014, 85 | Output all details  Average: 91  Max : 98  Min : 95 | Output all details  Average: 91  Max : 98  Min : 95 | Pass |
| 2 | Student 1 : 00000, Albert, Smith, 01 02 2005, 10  Student 2 : 12345, John, Doe, 10 25 2015, 100  Student 3 : 1144, Jay, Scott, 01 25 2018, 50  Student 4 : 877, Joe, Albert, 12 05 2005, 0  Student 5:  121, Mike, Alex, 05 08 2010, 80 | Output all details  Average : 48  Max: 100  Min: 0 | Output all details  Average : 48  Max: 100  Min: 0 | Pass |