



**COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE**  
**NCSC 114: PRINCIPLES OF PROGRAMMING LANGUAGES/PROGRAMMING 1**  
**END OF FIRST SEMESTER EXAMINATIONS**

**NOVEMBER 2021**

**LECTURER: MR MAKAMBWA**

**TIME: 5 HOURS**

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***INSTRUCTIONS***

1. Answer one question.
  2. Snip or take screen shot of all your interface and code.
  3. For all drawings or sketches use Draw IO application.
  4. Compile and submit your answers into one single PDF document format.
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**QUESTION 1**

- (a) The Grading System is the system of applying standardized measurements of varying levels of achievement in a course. University Grades are often assigned as letters (for example A through F), as a range (for example 1 to 6), as a percentage of a total number of questions answered correctly, or as a number out of a possible total.

The examination office at Africa University is requesting you to design and code an exam grading system using windows Application.

The program should have 3 Forms as follows.

- A welcome form with AU logo –Exam grading system. Button Login to access the Login form.
- A login form to secure the system ( **Username** admin and password grade001#)  
If correct username and password is entered the grading system form will be displayed allowing user to enter marks and display grades and comments otherwise an Error Message Invalid Username /And or password should be displayed.
- The grading system form- should have the following buttons **Process grade** ,**clear** and **exit**

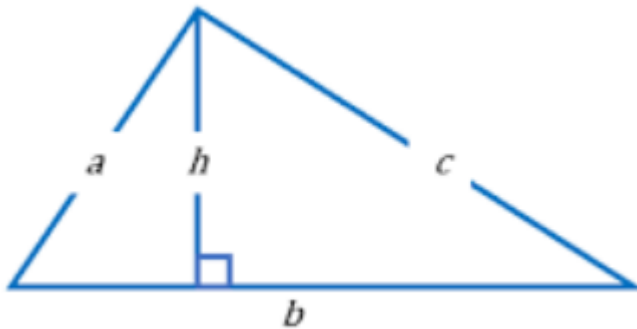
The program should allow the user to enter the student name and the percentage mark and display the Grade and the comment as shown below.

The program should validate the name textbox and the mark text and produces Error messages if the invalid data is entered e.g. in the name text box if one enters numbers an error message should be displayed

PERCENTAGE	GRADE	COMMENT
91-100	A <sup>+</sup>	First Class (1)
81-90	A	First Class (1)
75-80	A <sup>-</sup>	First Class (1)
70-74	B <sup>+</sup>	Upper Second Class (2.1)
65-69	B	Upper Second Class (2.1)
60-64	B <sup>-</sup>	Lower Second Class (2.2)
56-59	C <sup>+</sup>	Third Class (3)
53-55	C	Third Class (3)
50-52	C <sup>-</sup>	Third Class (3)
0-49	F	Fail (F)

- Sketch the Graphical User Interface.(Use Draw I.O for sketching the diagram) [4 marks]
- Identify the inputs, process and output of the program. [6 marks]
- Write the algorithm. [20 marks]
- Code and design the program. [20 marks]

- (b) (i) Write a console application program to calculate the **area** and **perimeter** of the following triangle. [10 marks]



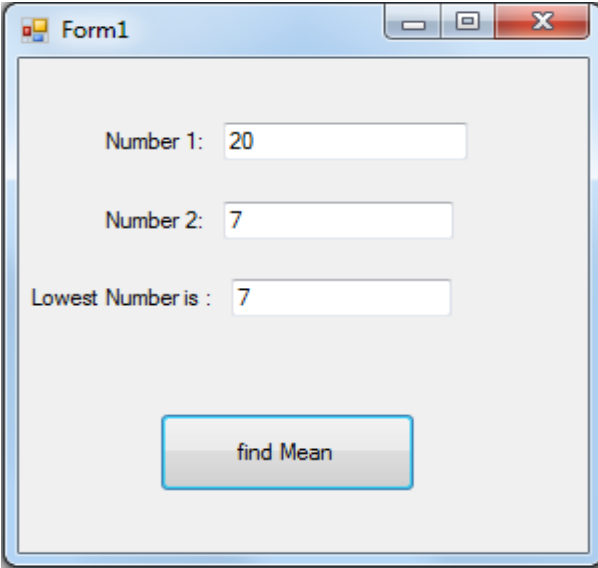
- (ii) Identify the input, process and output [6 marks]  
 (iii) Include a code to validate the input data. [4 marks]  
 (iv) Draw the program Flow chart. [10 marks]
- (c) The heating system in a school should be switched on if the average temperature is less than 17 degrees Celsius ( $^{\circ}\text{C}$ ). The average temperature is found from the temperatures in the Art, English and Music Departments. You are required to write a console application program that allows the user to input the three temperatures. The program calculates and displays the average temperature then displays 'Heating should be on.' or 'Heating should be off.' as appropriate. [20 marks]

## QUESTION 2

- (a) Using windows application design and code an application that simulates a calculator program and perform all the calculation as shown below. [50 marks]

First Number	<input type="text"/>
Second number:	<input type="text"/>
Result	<input type="text"/>
<div> <div>+</div> <div>-</div> <div>/</div> <div>*</div> <div>MOD</div> </div>	
<div> <div>Clear</div> <div>Exit</div> </div>	

- The program should include data validation and reject incorrect data entered by the user.
- (b) Using Try catch write a console program that prompts the user to enter any two numbers, which will divided, and produce output. The program should display an Error of division by ZERO if the user attempt to divide a number by ZERO and produce message box “Exception occurred Division by ZERO”. [20 marks]
- (c) Using windows application design a program to display the lowest number from two numbers entered if the numbers are equal it should display number numbers are equal. NB your program should include validation and display invalid data entered by the use and display an appropriate message. [30 marks]



The screenshot shows a Windows application window titled "Form1". Inside the window, there are three text input fields. The first field is labeled "Number 1:" and contains the value "20". The second field is labeled "Number 2:" and contains the value "7". The third field is labeled "Lowest Number is :" and contains the value "7". Below these fields is a button labeled "find Mean".

### Question 3

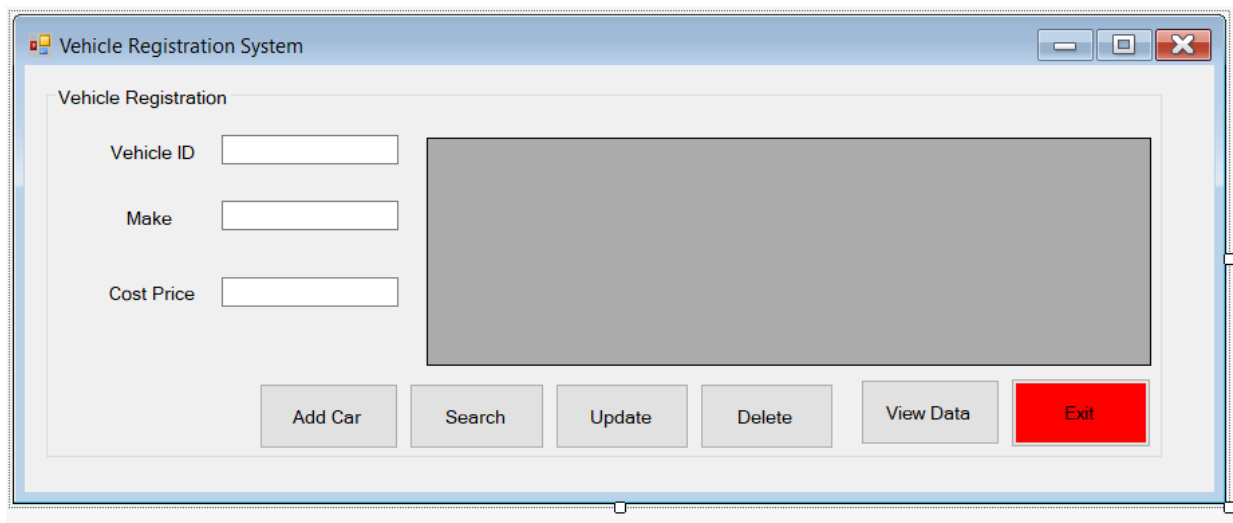
Using microsoft access create a database called Vehicles with the following fields in a table called cars:

Vehicle ID

Make

Costprice

Design and code the program using windows application as shown below and link it with Ms access database.



Snip or take a screenshot of the table in MS access.

Add code to all buttons as shown above to perform all the operations.

[100 marks]

**END OF EXAMINATION**

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