AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF ENGINEERING AND APPLIED SCIENCES

NCIS215: OBJECT ORIENTED PROGRAMMING

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER 2025

LECTURER: MR T.S. MUWANI

TIME: 3 HOURS

INSTRUCTIONS

1. Answer any **five** questions.
2. Each question carries 20 marks.
3. Provide PDF document and source codes in one folder.
4. Credit will be awarded for logical, systematic and neat presentations
5. Implement your solutions using Visual Studio

Question 1

Design a C# class representing a bank account. Include functionalities to:

i. Add funds ***(Deposit)***;

ii. Deduct funds ***(Withdraw)****;and*

iii. Retrieve the current balance ***(GetBalance.***

Enforce validation (e.g., prevent negative withdrawals).

[20 marks]

Question 2

Implement the bubble sort algorithm in C# to arrange an array of integers in ascending order. Print the array before and after sorting. [20 marks]

Question 3

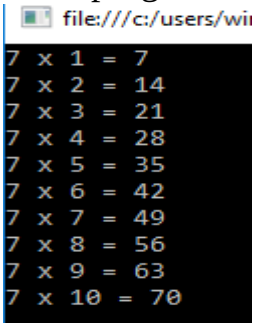
Create a program that calculates the area of a rectangle. The user should input the length and width, and the program should output the calculated area. Handle potential exception non-numeric input. [20 marks]

Question 4

Develop a C# function that verifies whether a given string is a palindrome, ignoring case sensitivity. [20 marks]

Question 5

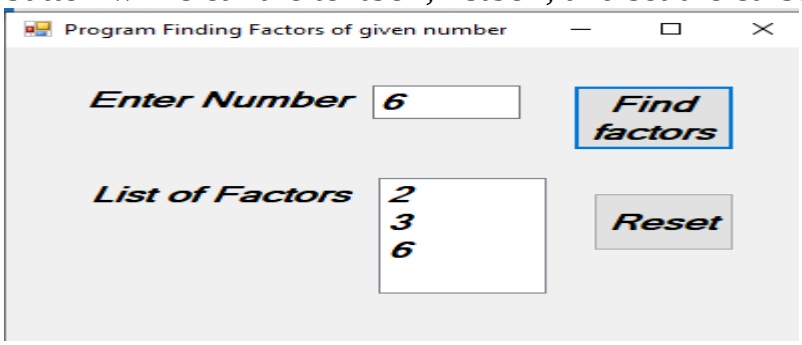
Using loops, write a program that displays the interface below:



[20 marks]

Question 6

Study the interface below of a program that accepts any number from the user and displays its factors in the listbox. Code the interface accordingly. The Reset button will clear the textbox, listbox, and set the cursor in the cleared textbox



[20 marks]

Question 7

a) Design a Car class with properties like Make, Model, and Year. Implement methods to display the car's details and to check if the car is vintage (older than 25 years). [10 marks]

b) Create a base class Animal with a method *Speak()*. Derive classes Dog and Cat from Animal, and implement the *Speak()* method for each animal. Demonstrate polymorphism by calling the *Speak()* method on an array of Animal objects. [10 marks]

END OF EXAMINATION