



“Investing in Africa’s future”

COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE (CBPLG)

NCSC 114: PRINCIPLES OF PROGRAMMING LANGUAGES/PROGRAMMING 1

END OF SECOND SEMESTER EXAMINATIONS

MAY 2021

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TIME: 7 HOURS

INSTRUCTIONS

Answer **One** question from this examination.

Run all programs on Visual Studio and then copy them on Ms Word

Start **each** question on a new page on your answer sheet.

The marks allocated to **each** question are shown at the end of the section.

All codes should in VB.Net Programming language

QUESTION ONE

A1

Consider the following problem statement:

A college offers a course that prepares students for the state licensing exam for real estate brokers. Last year, several of the students who completed this course took the licensing examination. The college wants to know how well its students did on the exam. You have been asked to write a program to summarize the results. You have been given a list of the 10 students. Next to each name is written a 1 if the student passed the exam and a 2 if the student failed the exam.

Your program should analyse the results of the exam as follows:

1. Input each test result (i.e., a 1 or a 2). Display the message "Enter result" on the screen each time the program requests another test result.
2. Count the number of test results of each type.
3. Display a summary of the test results, indicating the number of students who passed and the number of students who failed the exam.
4. If more than 8 students passed the exam, print the message "Raise tuition."

Write a VB.Net program that solves the problem. [20]

A2

Write VB.net programs using Windows Console Application to perform the following

- i. Calculate the factorial of a given number [5]
- ii. Check whether a number is a palindrome or it [5]
- iii. Calculate the sum of digits of a given number [5]
- iv. Check whether a given number is Armstrong or not [5]

A3

- a) Write a VB.Net program that adds the even numbers between 100 to 999 [7]
- b) Write a VB.Net application that calculates the sum of integers from 1 to 10. Use the **while** structure to loop through the calculation [6]
- a) Write VB.NET program to sum the odd numbers 1 to 99 using *for* structure. Assume the integer variables **sum** and **count** have been declared. [7]

A4

When the code is compiled and executed, it produces the following result:

Value of a: 10

Value of a: 11

Value of a: 12

Value of a: 13

Value of a: 14

Value of a: 15

Value of a: 16

Value of a: 17

Value of a: 18

Value of a: 19

Write VB.Net programs that will give the same output using the following control structures:

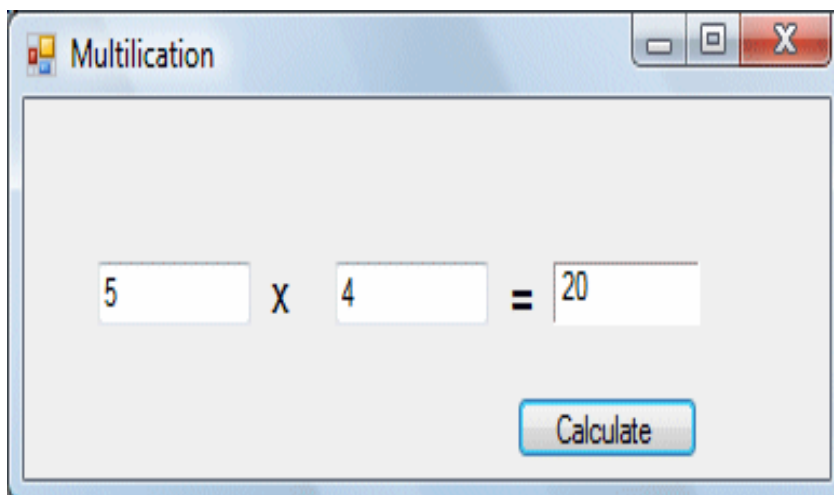
- | | |
|---------------------|-----|
| a) While loop | [5] |
| b) For loop | [5] |
| c) Do....while loop | [5] |
| d) Do Until loop | [5] |

A5

a)

Writing a Simple Multiplication Program

In this program, you insert two text boxes, three labels and one button. The text boxes are for the user to enter numbers, the label is to display the multiplication operator and the other label is to display the equal sign. The last label is to display the answer. The run time interface is shown in Figure below:



[10]

b) Write a program that will compute the following:

- i. 1000-100-95.....5
- ii. 10+20+30+.....1000

[5+5]

QUESTION TWO

B1

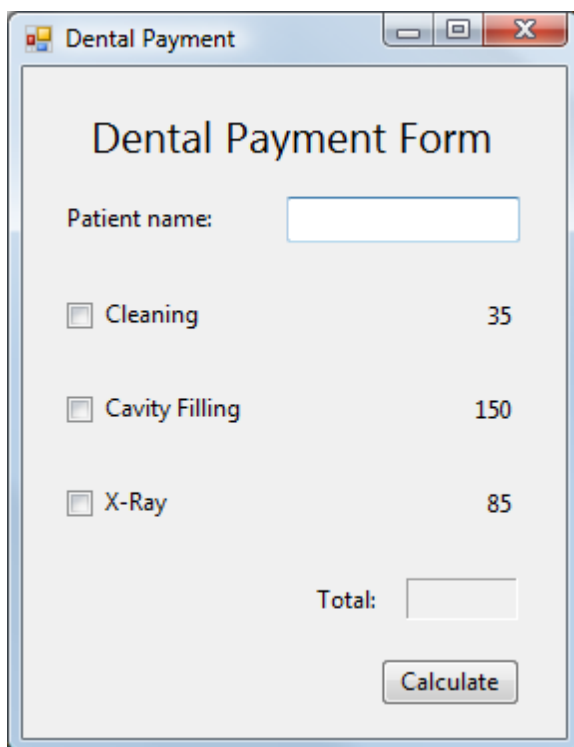
- a) Develop Visual Basic applications that will create a Dental Payment form

Application Requirements

A dentist's office administrator wishes to create an application that employees can use to bill patients. The application must allow users to enter the patient's name and specify which services were performed during the visit.

The application will then calculate the total charges. If a user attempts to calculate

a bill before any services are specified, or before the patient's name is entered, an error message informing the user that necessary input is missing will be displayed



[10]

- b) Many people are obese now and it could affect their health seriously. If your Body Mass Index (BMI) is more than 30, you are obese. You can refer to the following range of BMI values for your weight status.

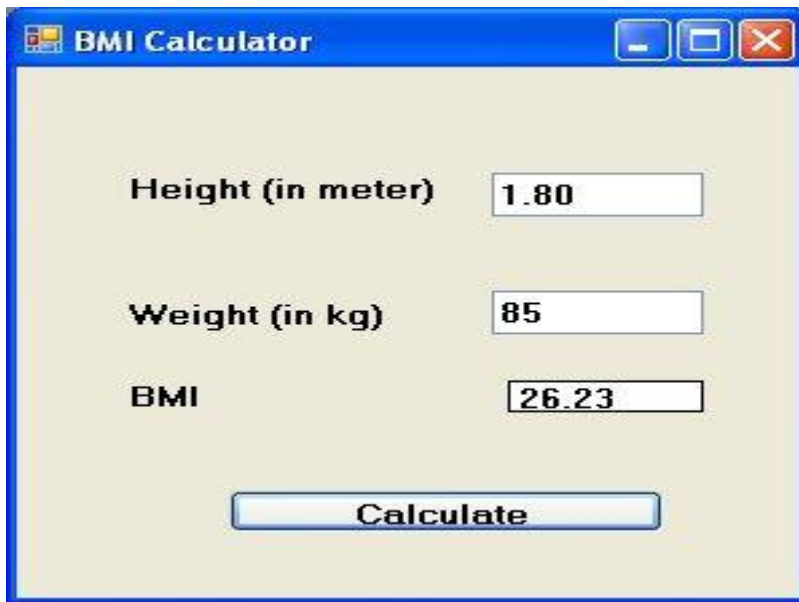
Underweight = <18.5

Normal weight = 18.5-24.9

Overweight = 25-29.9

Obesity = BMI of 30 or greater

Now create a calculator in Visual Basic that can calculate the body mass index, or BMI of a person based on the body weight in kilogram and the body height in meter. BMI can be calculated using the formula $\text{weight} / (\text{height})^2$, where weight is measured in kg and height in metre



[10]

B2

a) Write a VB.net program that classifies people according to their ages:

- Age ≥ 65 : "Old Person "
- Age between 40 and 64: " Middle Age"
- Age between 20 and 39: "Young Adult"
- Age between 13 and 19 : " Teenage "
- Age between 0 and 12 : " Child"
- Less than 0 and more than 150: "Not human"

[10]

b) Write a program that will compute the following:

- iii. $1000 - 100 - 95 \dots\dots\dots 5$
- iv. $10 + 20 + 30 + \dots\dots\dots 1000$

[5+5]

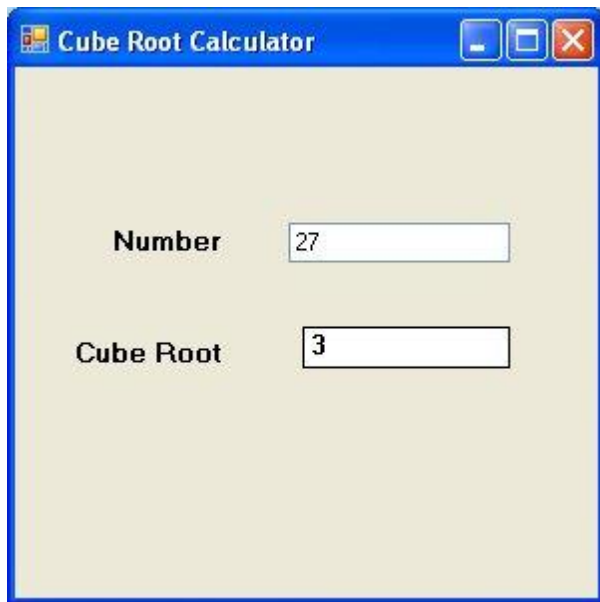
B3

a) The Fix function truncates the decimal part of a positive number and returns the largest Integer smaller than the number. However, when the number is negative, it will return smallest integer larger than the number. For example, Fix (9.2)=9 but Fix(-9.4)=-9. Write a Visual Basic application that executes the above stated function. [5]

b) The Log function is the function that returns the natural logarithm of a number. For example, Log (10) =2.302585. Write Visual Basic application that computes the log function. [5]

c) The Exp of a number x is the exponential value of x, i.e. e^x . For example, Exp(1)= $e=2.71828182$ The syntax is :Math.Exp (number). Find the exponential of a given Real Number. [5]

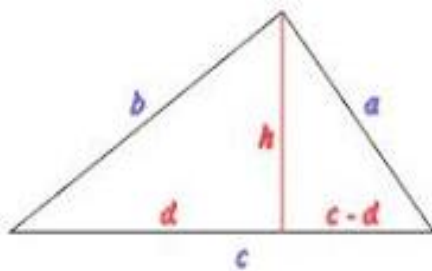
d) Write a Visual Basic program that calculates the cube root of a given number



[5]

B4

- Write a Visual Basic program that calculates the roots of a quadratic equation expressed in the form $f(x): ax^2+bx+c=0$
- Write a Visual Basic program that calculates the area of triangle with sides a, b, c as integers.



Hint use Heron's formula

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{where } s = \frac{1}{2}(a+b+c)$$

[10+10]

B5

Write a Visual Basic program that calculates the following

- Area of a right-angled triangle
- Area of a square
- Volume of a cylinder
- Volume of a cube
- Area of Rhombus

[5x4]

QUESTIONTHREE

Write a:

- a) Program to Check whether the Entered Number is Even or Odd [10]
- b) Program to Perform Celsius to Fahrenheit Conversion [10]
- c) Program to Find a third Number using Pythagoras Theorem [10]
- d) Program to Find the Sum of first 50 Natural Numbers using For Loop [10]
- e) Program to generate Armstrong numbers in a given range [10]
- f) Program to calculate the diameter and area of a circle given its radius [10]
- g) Program that prints all the multiples of 17 less than 100 [10]
- h) Program that display all the factors of an entered number [10]
- i) Program to illustrate the trigonometry angles in degrees [10]
- j) Program to find Maximum and Minimum from an Array [10]

END OF EXAMINATION
