higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

INTRODUCTION TO SYSTEMS DEVELOPMENT

(Second paper)

NQF LEVEL 2

(10041022)

25 November 2022 (X-paper)
09:00–13:00

This question paper consists of 13 pages.

577Q2N2225

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TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.

2. Read all the questions carefully.

3. Number the answers according to the numbering system used in this question paper.

4. Students must be seated in the computer laboratory 30 minutes before the start of the examination to ensure that all computers have appropriate programs.

5. Questions must be completed on a computer by using MS Office 2010 or a later version, and VB.NET 2008 or VB.NET Express or a later version.

6. Print your work immediately after completing a question. Ensure that your EXAMINATION NUMBER appears on each PRINTOUT. No questions without a printed EXAMINATION NUMBER will be marked.

7. In the event of problems such as a power failure or a computer or printer breakdown, the invigilator will make the necessary arrangements to continue with the examination process once the problem has been resolved. Students will not be penalised for time lost under these circumstances.

8. ALL work on the computer should be saved at regular intervals to prevent loss of work. No additional time may be allowed for work lost due to lack of saving.

9. NO student may print his/her work for another student or make a memory stick available to another student or access another student's work on the network. Any attempt to access any information from or transfer information to another student in whatever manner is a contravention of the examination rules and regulations and will be viewed in an extremely serious light.

10 All PRINTOUTS or screen prints done during the session must be submitted.

11. Students may NOT copy the source code from VB.NET to MS Word and then print it from the word processor.

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12. Steps to print a VB.NET form or any other screen:

    12.1 Run the solution.

    12.2 Hold the ALT key down and press the *Print Scrn* key which will copy the active screen.

    12.3 Open MS Word and paste the form/screen in a new document.

    12.4 Add your EXAMINATION NUMBER to the top right-hand side of the page.

    12.5 Print the page.

13. You are allowed to use the help files in VB.NET.

14. The following files will appear on your hard drive in the following folders:

    14.1 QUESTION 1

    C:\ISD L2 P2\stopAbuse
    (Microsoft Visual Studio Solution)
    C:\ISD L2 P2\Images\abuseIMG1
    C:\ISD L2 P2\Images\abuseIMG2

    14.2 QUESTION 2

    C:\ISD L2 P2\medicalCenter
    (Microsoft Visual Studio Solution)

    14.3 QUESTION 3

    C:\ISD L2 P2\computeNumbers
    (Microsoft Visual Studio Solution)

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QUESTION 1

The following question refers to the VB.NET solution *stopAbuse* (ISD L2 P2 *stopAbuse*) that has been saved on the hard drive.

IT volunteers in your community have decided to design a program that can be used by community members to seek help or report any form of abuse. People who suffer from abuse can use the program to tell their story and seek advice or/and make an appointment for counselling.

FIGURE 1 below is a print screen of what the user interface looks like:

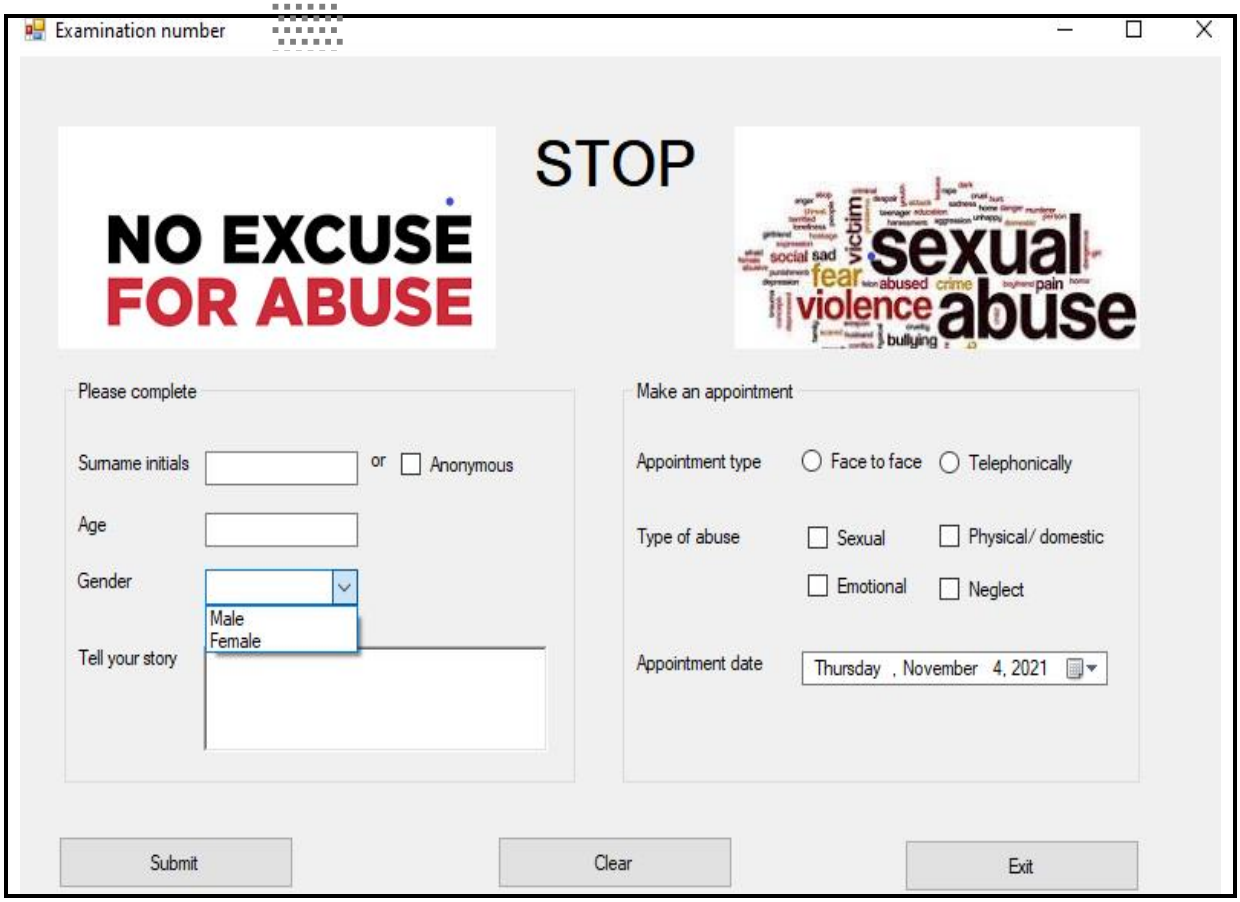

FIGURE 1

A blank form has been saved on the hard drive. Open the solution *stopAbuse* and follow the instructions to build the user interface.

1.1 Change the text in the title bar of the form to your EXAMINATION NUMBER. (1)

1.2 Add a label to the form.

CONTROL	TEXT	FONT	FONT STYLE	FONT SIZE
Label	STOP	Microsoft Sans Serif	Bold	28

(2)

1.3 Add TWO picture boxes to the form.

CONTROL	IMAGE
Picture box	Use the image saved on the hard drive called abuseIMG1
Picture box	Use the image saved on the hard drive called abuseIMG2

(2)

1.4 Add TWO group boxes to the form.

CONTROL	TEXT
Group box	Please complete
Group box	Make an appointment

(2)

1.5 Add the following labels to the form:

CONTROL	TEXT
Label	Surname initials
Label	Age
Label	Gender
Label	Tell your story
Label	Appointment type
Label	Type of abuse
Label	Appointment date

(7)

1.6 Add a checkbox to the form.

CONTROL	TEXT
Checkbox	Anonymous

(1)

1.7 Add TWO textboxes to the form.

CONTROL	NAME	TEXT
Textbox	txtSurname	Blank
Textbox	txtAge	Blank

(2)

1.8 Add a combo box to the form.

CONTROL	NAME	TEXT
Combo box	cmbGender	Blank

(1)

1.9 Add a RichTextBox to the form.

CONTROL	TEXT
RichTextBox	Blank

(1)

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1.10 Add TWO radio buttons to the form.

CONTROL	TEXT
Radio button	Face to face
Radio button	Telephonically

(2)

1.11 Add FOUR check boxes.

CONTROL	TEXT
Checkbox	Sexual
Checkbox	Physical/Domestic
Checkbox	Emotional
Checkbox	Neglect

(4)

1.12 Add a DateTimePicker to the form. (1)

CONTROL	NAME
DateTimePicker	dtpDate

1.13 Add THREE buttons to the form.

CONTROL	NAME	TEXT
Button	btnSubmit	Submit
Button	btnClear	Clear
Button	btnExit	Exit

(3)

1.14 Print the form. (1)

[30]

QUESTION 2

The following question refers to the VB.NET solution *medicalCenter* (ISD L2 P2\ *medicalCenter*) that has been saved on the hard drive.

A team of local medical practitioners has come together to provide cheaper medical services to people with low income in your community. They asked you to design a program that can be used to make an appointment for people seeking medical attention.

Study the following IPO chart:

Input	Processing	Output

`SurnameInitials`
`MedicalSpecialist`
`AppointmentDate`
`Time`
	`AmountPayable =`
	`appointmentFee + consultationFee`
		`appointmentFee`
		`consultationFee`
		`amountPayable`

Study the following tables:

Appointment fee

Medical specialist	Appointment fee
GP – General practitioner	R50,00
Dentist/Optometrist/OB-GYN	R100,00

Consultation fee

GP – General practitioner	R200,00
Dentist	R500,00
Optometrist	R600,00
OB-GYN obstetrician and gynaecologist	R700,00

FIGURE 2 below is a print screen of what the user interface looks like:

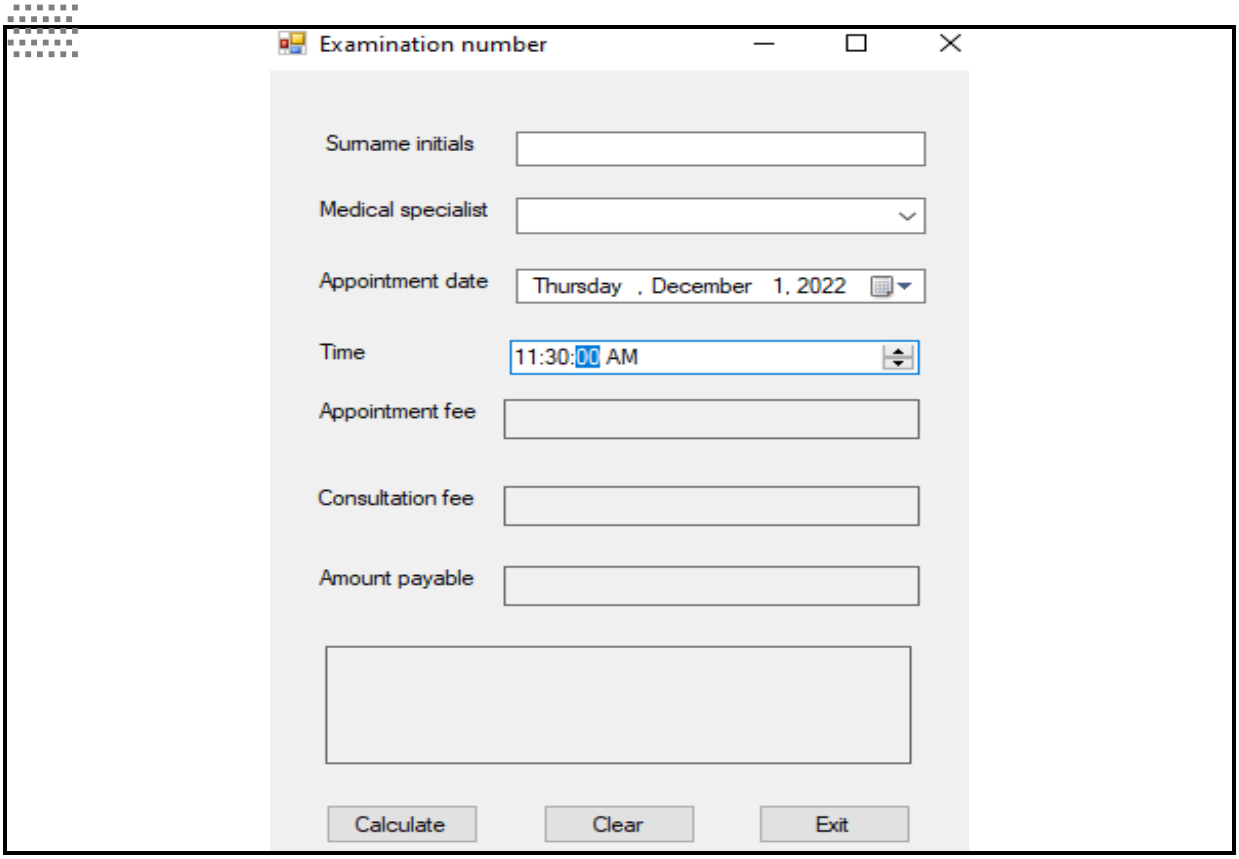

FIGURE 2

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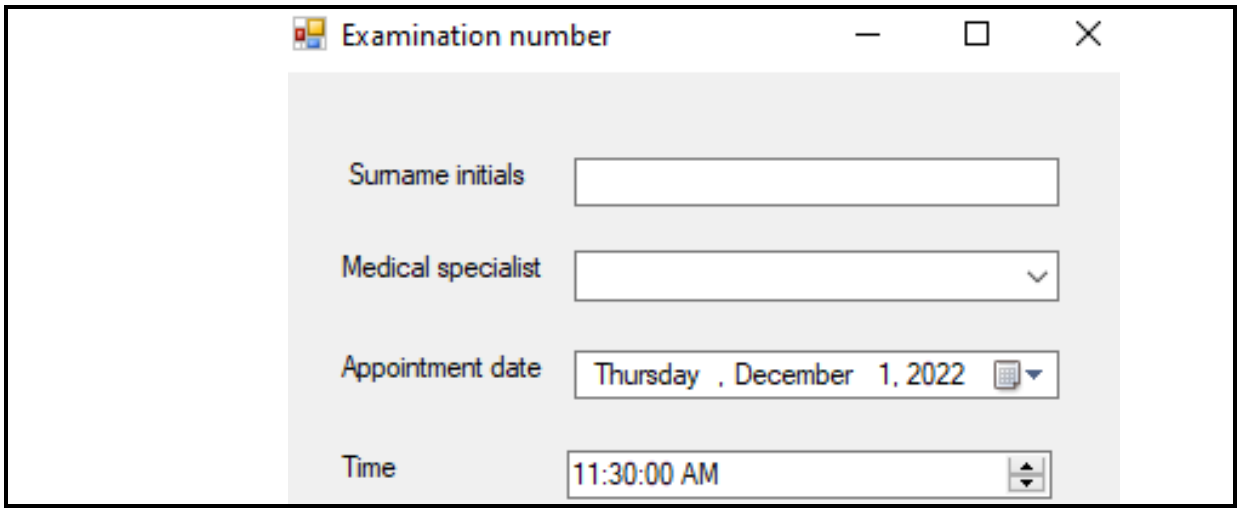
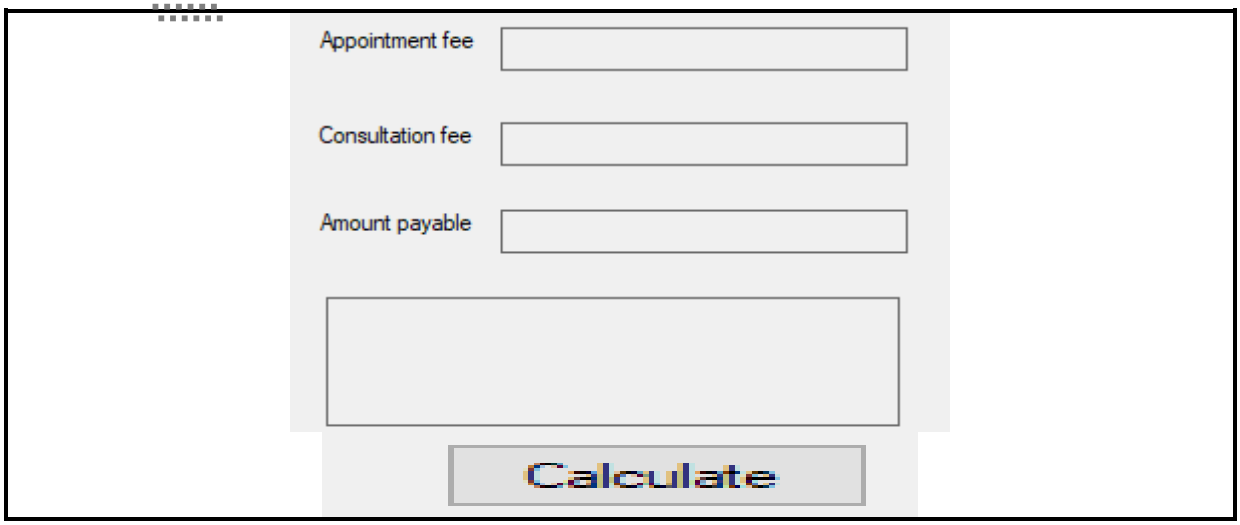
The following steps explain how to use the program:

STEP 1: Run the program. Enter surname initials, select medical specialist, and display appointment fee, select appointment date and time.



STEP 2: Click the *Calculate* button to compute the consultation fee and amount payable.



STEP 3: Click the *Clear* button to clear all appropriate controls on the form.



STEP 4: Click the *Exit* button to terminate the program.



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The completed user interface has been saved on the hard drive. Open the solution *medicalCenter* and follow the instructions below to complete the program. **NOTE:** Do NOT declare your own variables, but use the global variables provided.

2.1 Add your EXAMINATION NUMBER as a comment to your source code. (1)

2.2 Add the following program code to the click event of the *Calculate* button:

2.2.1 Assign surname, appointment date and appointment time to appropriate variables, and convert to appropriate data types. (4)

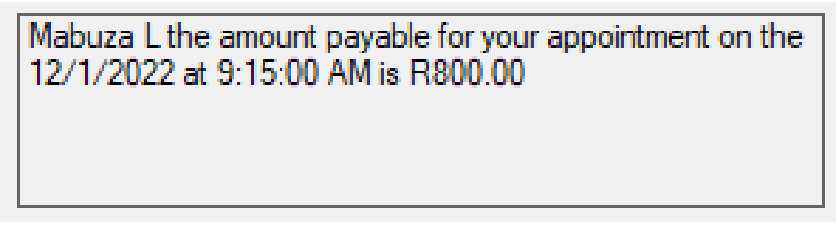
2.2.2 Refer to the consultation-fee table above and use the *Select case statement* to determine the consultation fee. (6)

2.2.3 Write code to calculate the amount payable. **HINT:** Use the formula in the IPO chart. (2)

2.2.4 Add code to display the CONSULTATION FEE on the appropriate label and format the value to currency as indicated in FIGURE 3 (below). (3)

2.2.5 Add code to display the AMOUNT PAYABLE on the appropriate label and format the value to currency as indicated in FIGURE 3 (below). (3)

2.2.6 Write code to display a CONCATENATED MESSAGE on the appropriate label as indicated below:



(4)

2.3 Add code to complete the click event of the *Clear* button to clear all appropriate controls. (3)

2.4 Open the click event of the *Exit* button and add code to terminate the program. Add a message box to confirm program termination. (4)

2.5 Change the form title bar to your EXAMINATION NUMBER. (1)

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2.6 Run the program, enter the test data, and print the form as indicated in FIGURE 3 (below).

Surname initials	Mabuza L
Medical specialist	OB/GYN – obstetrician and gynaecologist
Appointment date	01/12/2022
Time	9:15

(2)

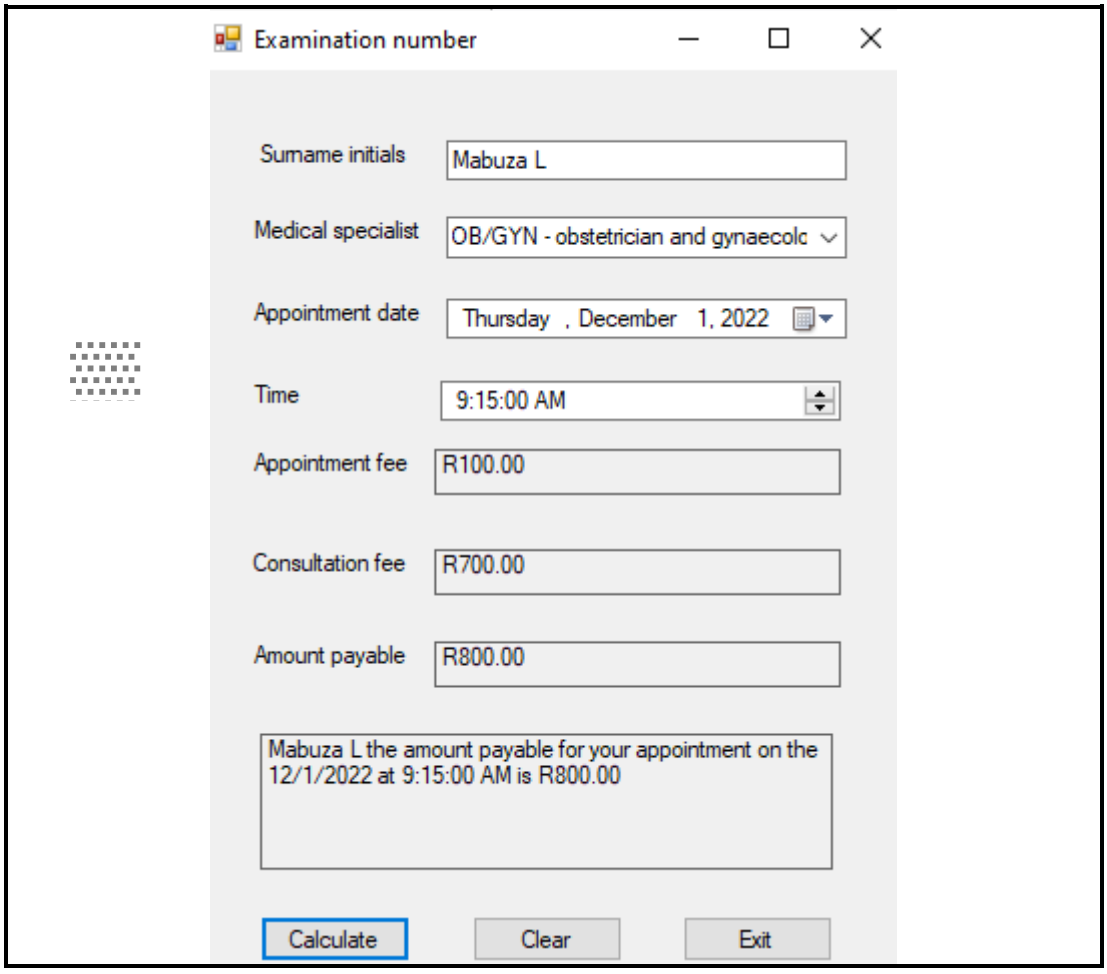


FIGURE 3

2.7 Print the source code. (1)

[34]

QUESTION 3

The following question refers to the VB.NET solution *computeNumbers* (ISD L2 P2\ *computeNumbers*) that has been saved on the hard drive.

You have been tasked with designing a program that will prompt the user to enter TWO numbers. The program compares the two numbers to find and display the highest number, division, remainder, and average of the two numbers entered by the user.

Study the following IPO chart:

Input	Processing	Output

`firstNumber`
`secondNumber`
	`division = firstNumber/secondNumber`
	`remainder = firstNumber mod secondNumber`
	`average = (firstNumber + secondNumber)/2`
		`highestNumber`
		`division`
		`remainder`
		`average`

FIGURE 4 below is a print screen of what the user interface looks like:

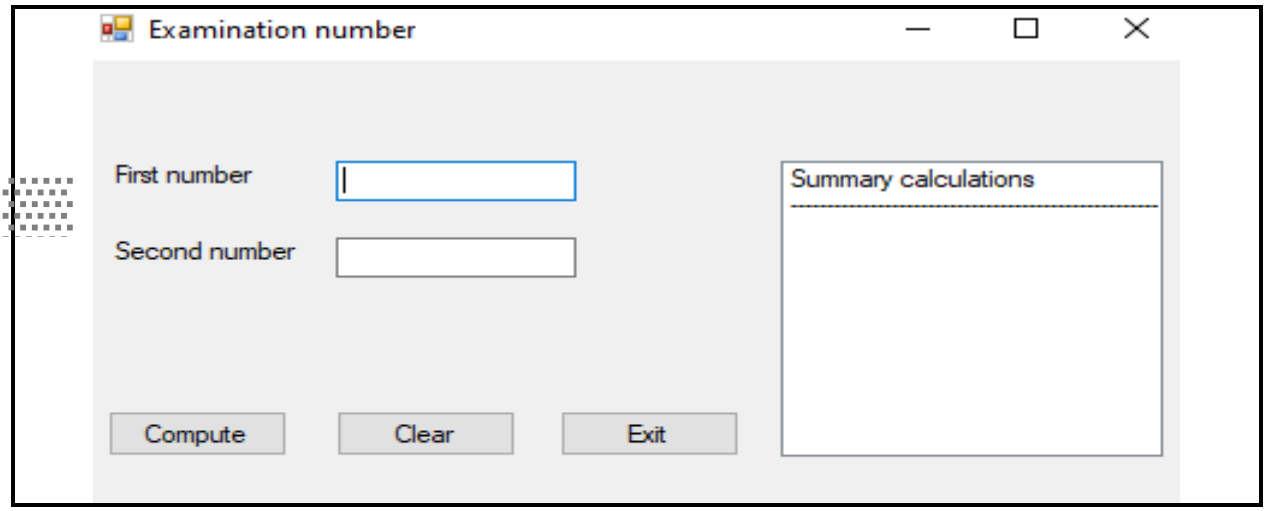
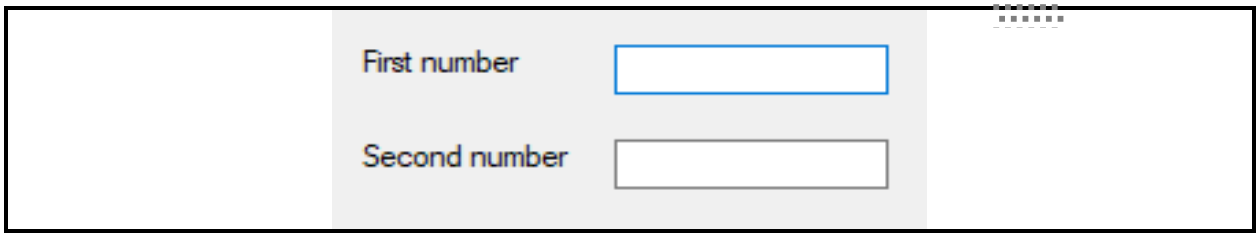


FIGURE 4

The following steps explain how to use the program:

STEP 1: Enter the first and second number.



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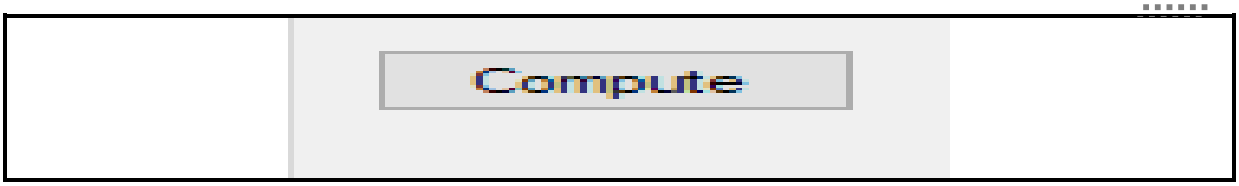
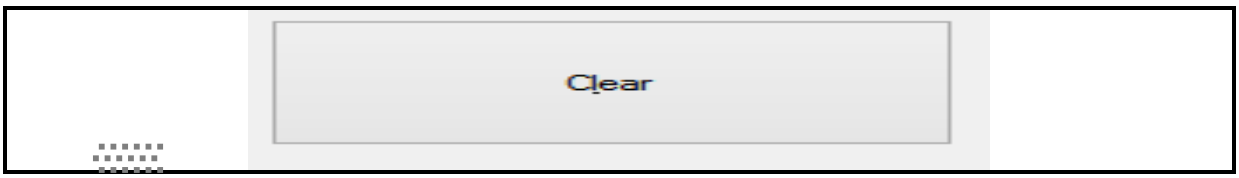
STEP 2: Click the *Compute* button to calculate and display the highest number, division, remainder and average of the two numbers.



STEP 3: Click the *Clear* button to clear all appropriate controls on the form.



STEP 4: Click the *Exit* button to terminate the program.



The completed user interface has been saved on the hard drive. Open the solution *computeNumbers* and follow the instructions below to complete the program. **NOTE:** Use the local variables provided.

3.1 Add your EXAMINATION NUMBER as a comment to your source code. (1)

3.2 Add the following code to the click event of the *Compute* button:

3.2.1 Write code to check if the first number is a numeric value. If not, alert the user, clear the appropriate control, and terminate processing. (4)

3.2.2 Check that the second number is a numeric value. If not, alert the user, clear the appropriate control, and stop processing. (3)

3.2.3 Assign user input to appropriate variables and convert to appropriate data type. (3)

3.2.4 Write code to determine the highest number between the first number and second number. **HINT:** Use a selection structure, e.g., *if statement.* (4)

3.2.5 Add code to divide the first number by the second number. **NOTE:** Use the formula in the IPO chart and apply the *truncate* method to cut off digits after the comma. (3)

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3.2.6 Write code to compute the remainder between the first number and second number, and the average. **NOTE:** Use the formula in the IPO chart. (5)

3.2.7 Write code to display the highest number, division, remainder, and average on the list box. **NOTE:** Add all necessary headings as indicated in FIGURE 5 (below). (5)

3.3 Open the click event of the *Clear* button, and add code to clear BOTH textboxes and set the cursor back to the appropriate control. (3)

3.4 Open the click event of the *Exit* button, and add code to terminate the program. (1)

3.5 Change the form title bar to your EXAMINATION NUMBER. (1)

3.6 Run the program, enter any test data, and print the form as indicated in FIGURE 5 (below). (2)

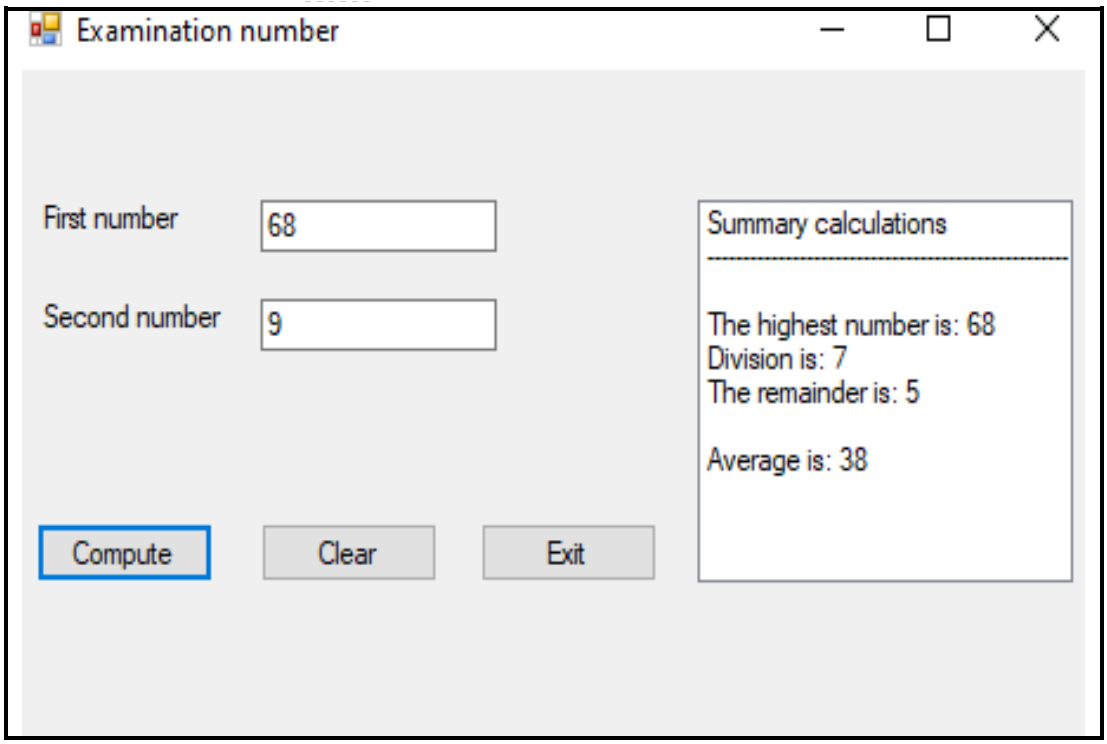

FIGURE 5

3.7 Print the source code. (1)

[36]

TOTAL: 100

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