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)

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This question paper consists of 17 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
INTRODUCTION TO SYSTEMS DEVELOPMENT
NQF LEVEL 2
PAPER 2
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 the appropriate programs.
5. Questions must be completed on a computer 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 for the candidate to continue with the examination once the problem has been resolved. Students will not be penalised with 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 to redo work lost due to not 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.

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

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

    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

    \ Blood_donation_screening
    (Microsoft Visual Studio Solution)
    C:\ISD L2 P2\Images\ bloodDonation

    14.2 QUESTION 2

    …\ Thlakwaneng_Lodge
    (Microsoft Visual Studio Solution)

    14.3 QUESTION 3

    …\ KZNfloodsPledge
    (Microsoft Visual Studio Solution)

    14.4 QUESTION 4

    …\ fitness_assessment
    (Microsoft Visual Studio Solution)

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QUESTION 1

This question refers to the VB.NET solution, *Blood_donation_screening,* that has been saved on the hard drive.

Your company has been recruited by a neighbourhood NGO to develop a system for vetting potential blood donors. The software enables the user to enter personal information such as blood group type, chronic conditions and allergies.

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

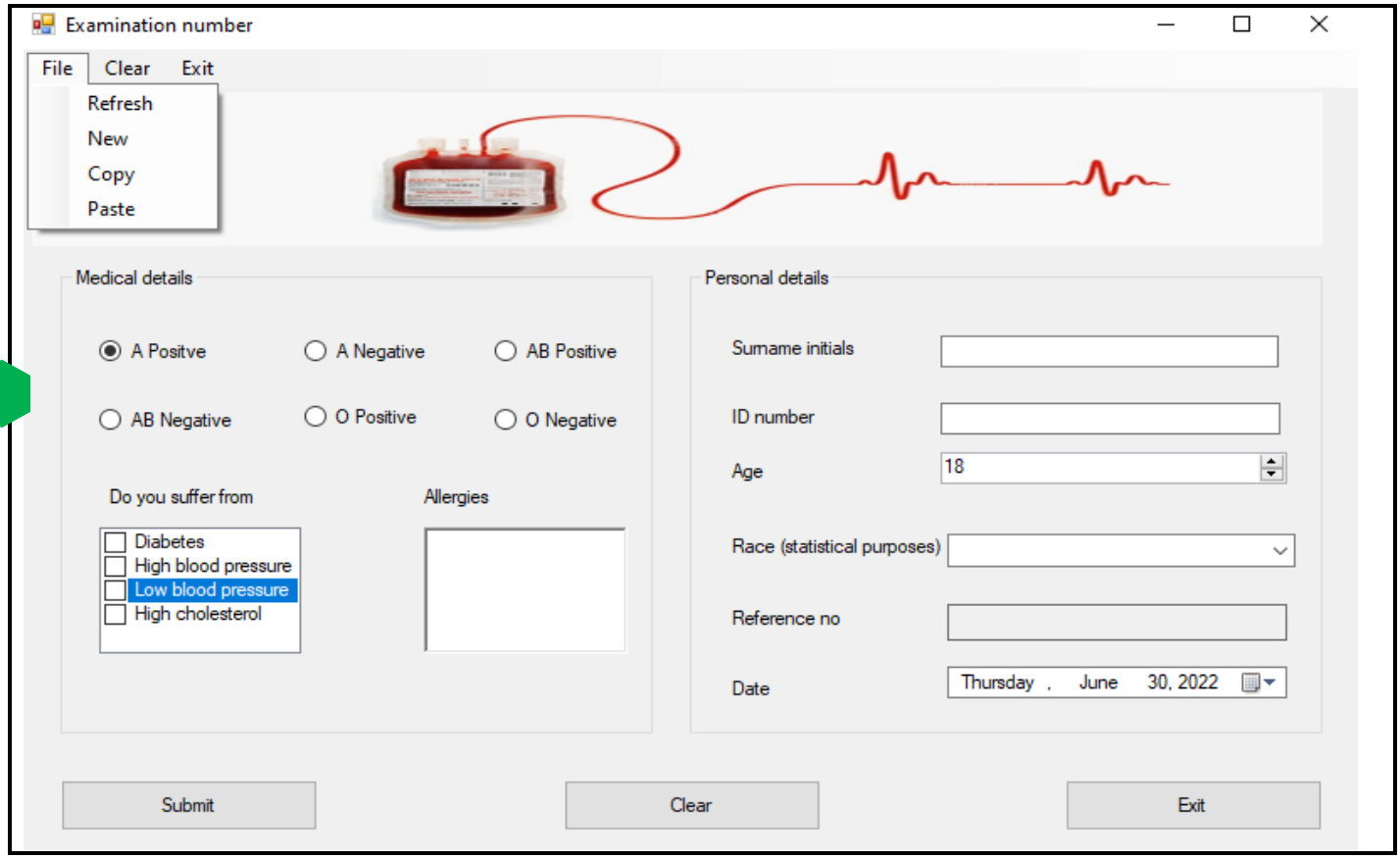
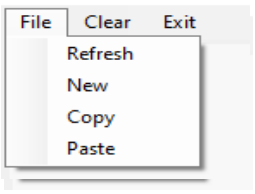


FIGURE 1

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

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

1.2 Add a *menuStrip* and the options shown below to the form:



(2)

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1.3 Add a picture box to the form.

CONTROL	IMAGE
Picture Box	Use the image saved on the hard drive called *bloodDonation*.

(2)

1.4 Add two group boxes to the form.

CONTROL	TEXT
Group box	Medical details
Group box	Personal details

(2)

1.5 Add the following radio buttons to the form.

CONTROL	TEXT
Radio button	A Positive
Radio button	A Negative
Radio button	AB Positive
Radio button	AB Negative
Radio button	O Positive
Radio button	O Negative

(6)

1.6 Add the following labels to the form.

CONTROL	TEXT
Label	Do you suffer from
Label	Allergies
Label	Surname initials
Label	ID number
Label	Age
Label	Race (statistical purposes)
Label	Reference no
Label	Blank
Label	Date

(9)

1.7 Add a *checkedListBox* to the form.

CONTROL	ITEMS
CheckedListBox	Diabetes
	High blood pressure
	Low blood pressure
	High cholesterol

(2)

1.8 Add a *RichTextBox* to the form.

CONTROL	TEXT
RichTextBox	Blank

(1)

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1.9 Add two text boxes.

CONTROL	TEXT
Textbox	Blank
Textbox	Blank

(2)

1.10 Add a combo box to the form.

CONTROL	TEXT
Combo box	Blank

(1)

1.11 Add a *dateTimePicker* to the form.

CONTROL	Value
dateTimePicker	Default date

(1)

1.12 Add three buttons to the form.

CONTROL	TEXT
Button	*Submit*
Button	*Clear*
Button	*Exit*

(3)

1.13 Print the form.

[32]

QUESTION 2

This question refers to the VB.NET solution, *Thlakwaneng_Lodge,* that has been saved on the hard drive.

The local Royal council, which is the owner of the Thlakwaneng Lodge, has engaged you to create a program that will allow its customers to make reservations at the lodge.

Study the following IPO chart.

Input	Processing	Output
Full name Contact no Rooms Check in date Check out date	NoOfNights = checkOutDate – checkInDate AmountPayable = initialPrice x noOfNights	No of nights Amount payable

Study the following tables:

ROOM	INITIAL PRICE
2 sleeper	1000
4 sleeper	1800
8 sleeper	2500

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

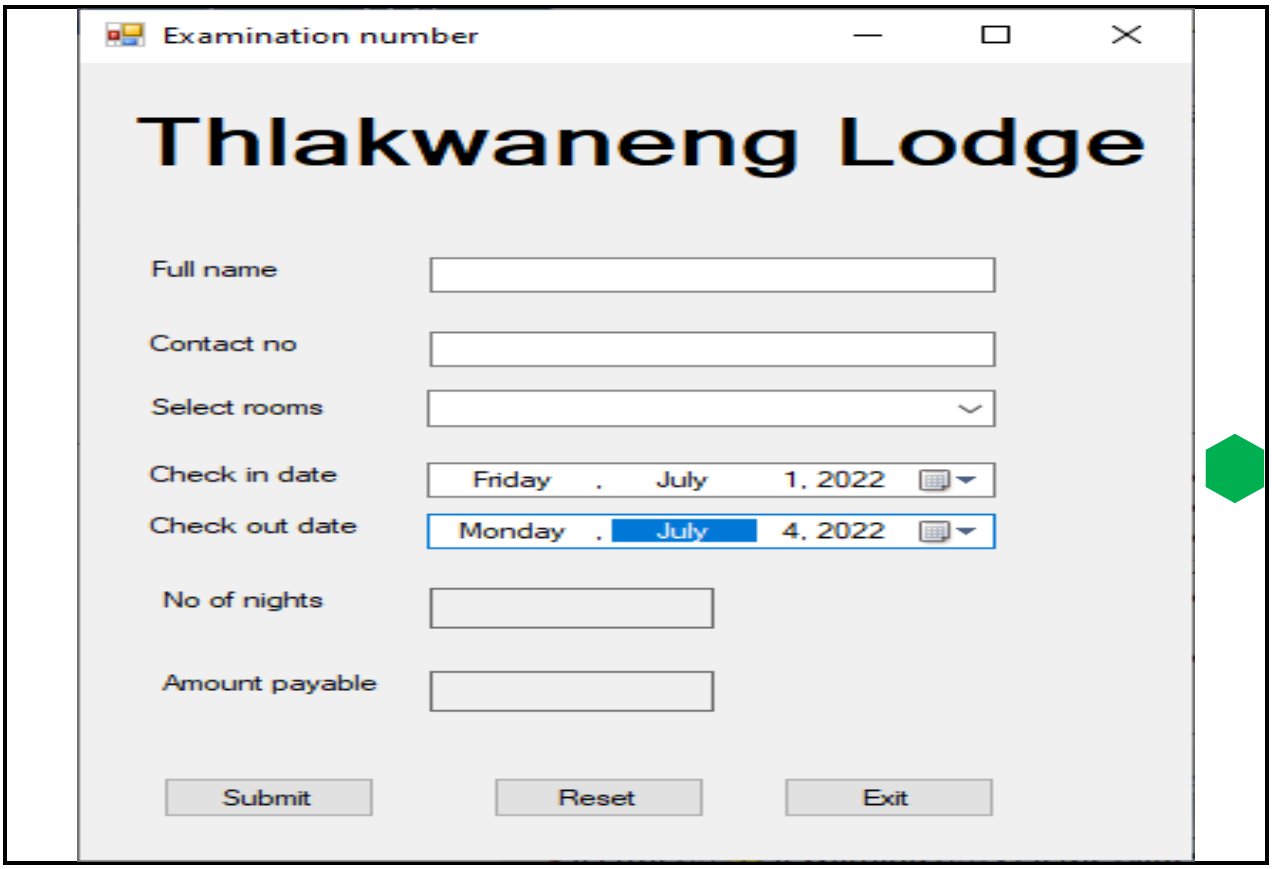
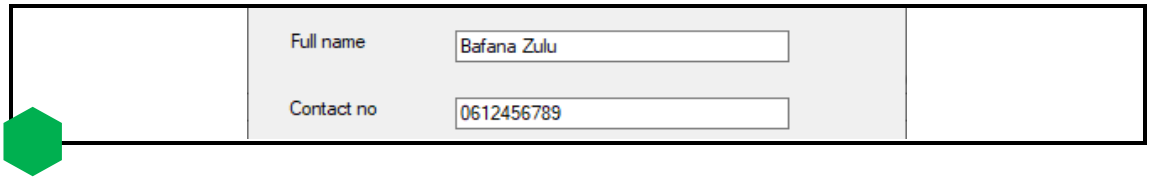


FIGURE 2

The following STEPS explain how to use the program:

STEP 1: Run the program. Enter full name and contact no.



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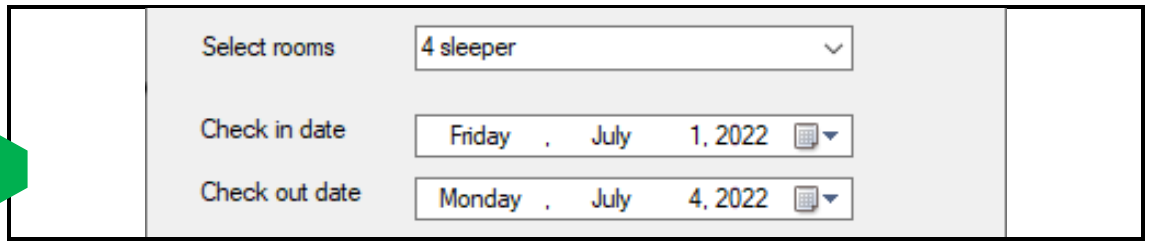
STEP 2: Select rooms, set check in date, and set check out date.



STEP 3: To calculate the number of nights and the payment due upon booking confirmation, click the *Submit* button.

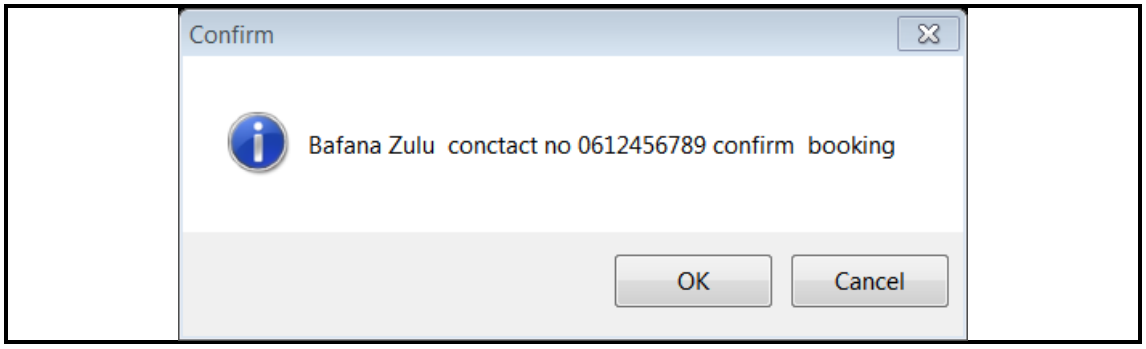
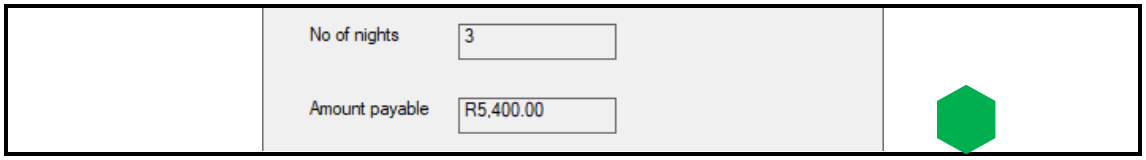


FIGURE 2.1



The completed user interface has been saved on the hard drive. Open the solution, *Thlakwaneng Lodge,* and follow the instructions below to complete the program and change the form title bar to your EXAMINATION NUMBER.

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

2.2 Open the *SelectedIndexChanged* event of the *cmbRooms* combo box and add an *if statement* to assign the initial price to the given global variable. (5)

NOTE: Refer to the table given.

2.3 Open the click event of the *Submit* button and add the following code:

2.3.1 Write code to assign *full name, contact no, check in and check out date* to appropriate variables. (3)

2.3.2 Add a formula to calculate number of nights. Note: refer to the IPO chart. (3)

2.3.3 Add a formula to calculate the amount payable.

NOTE: Refer to the IPO chart. (2)

2.3.4 Write code that will display booking confirmation upon displaying number of nights and amount payable as indicated in FIGURE 2.1. Processing must be terminated should the user click the *Cancel* button (4)

2.3.5 Write code that will allow the user to display the number of nights and amount payable on appropriate labels. (3)

2.4 Open the click event of the *Reset* button and add code to clear or reset all appropriate controls. (4)

2.5 Add code to terminate the program to the click event of the *Exit* button. (1)

2.6 Run the program, enter any test data, and print the form as indicated in FIGURE 2.2 (2)

Make a PRINTOUT of the source code.

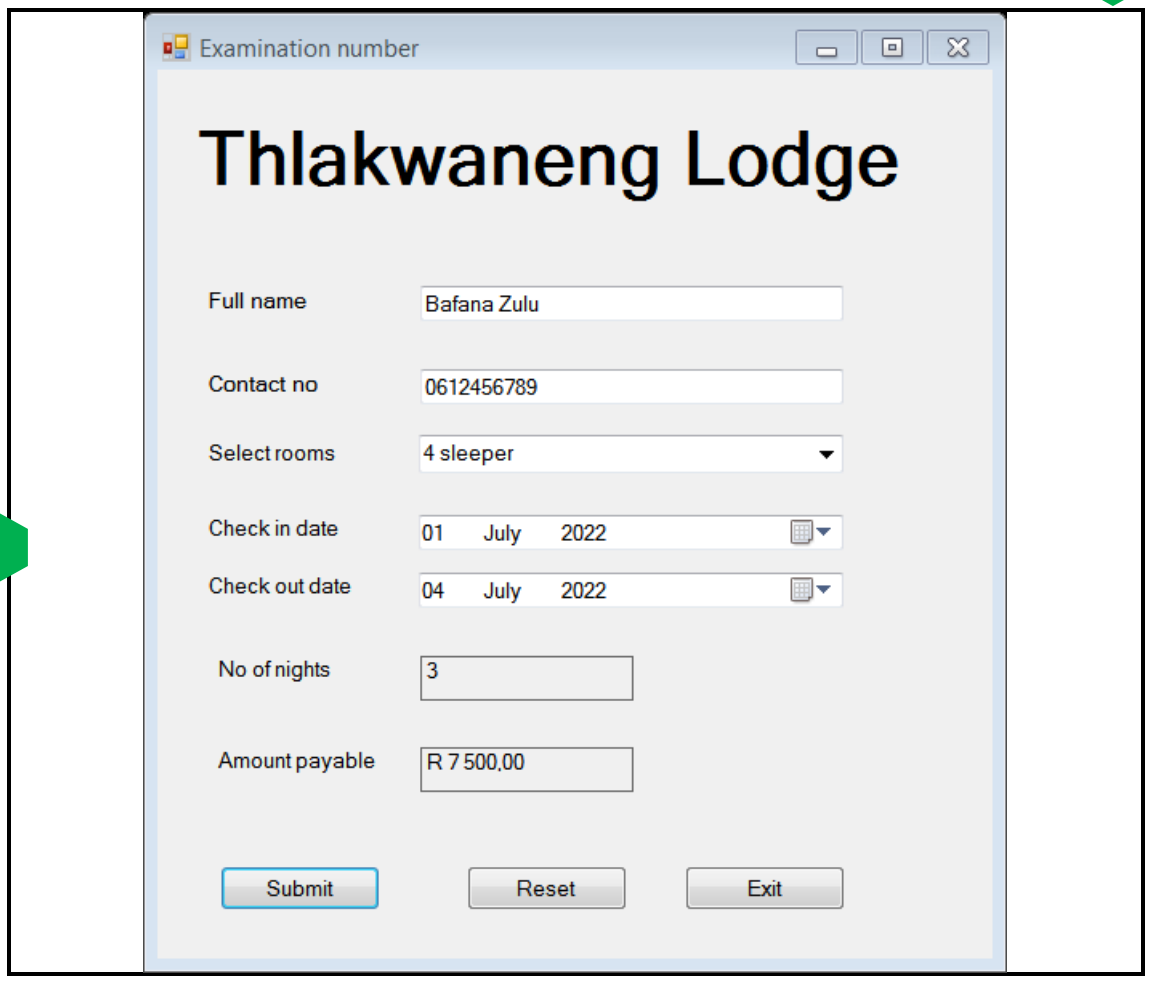


FIGURE 2.2

[28]

QUESTION 3

This question refers to the VB.NET solution, *KZNfloodsPledge,* that has been saved on the hard drive.

Members of BRICS (Brazil, Russia, India, and China) have pledged to help those affected by the recent floods in KZN. You've been asked to develop a program that will be used to record contributors' contact information and desired donation amounts. The program must be able to exchange Chinese yuan, Indian rupee, Brazilian real, and Russian rouble for South African rand (ZAR).

Study the following table:

	Brazil	Russia	India	Chinese
Currency	Brazilian real	Russian rouble	Indian rupee	Chinese yuan
Currency rate	3,09	0,29	0,21	2.4

Study the following IPO chart:

Input	Processing	Output
Full names Surname Contact no Address Date Donation amount Currency	AmountConverted = donationAmount x currencyRate	Currency Currency rate Amount converted Summary

FIGURE 3 below is a screen print of what the user interface looks like

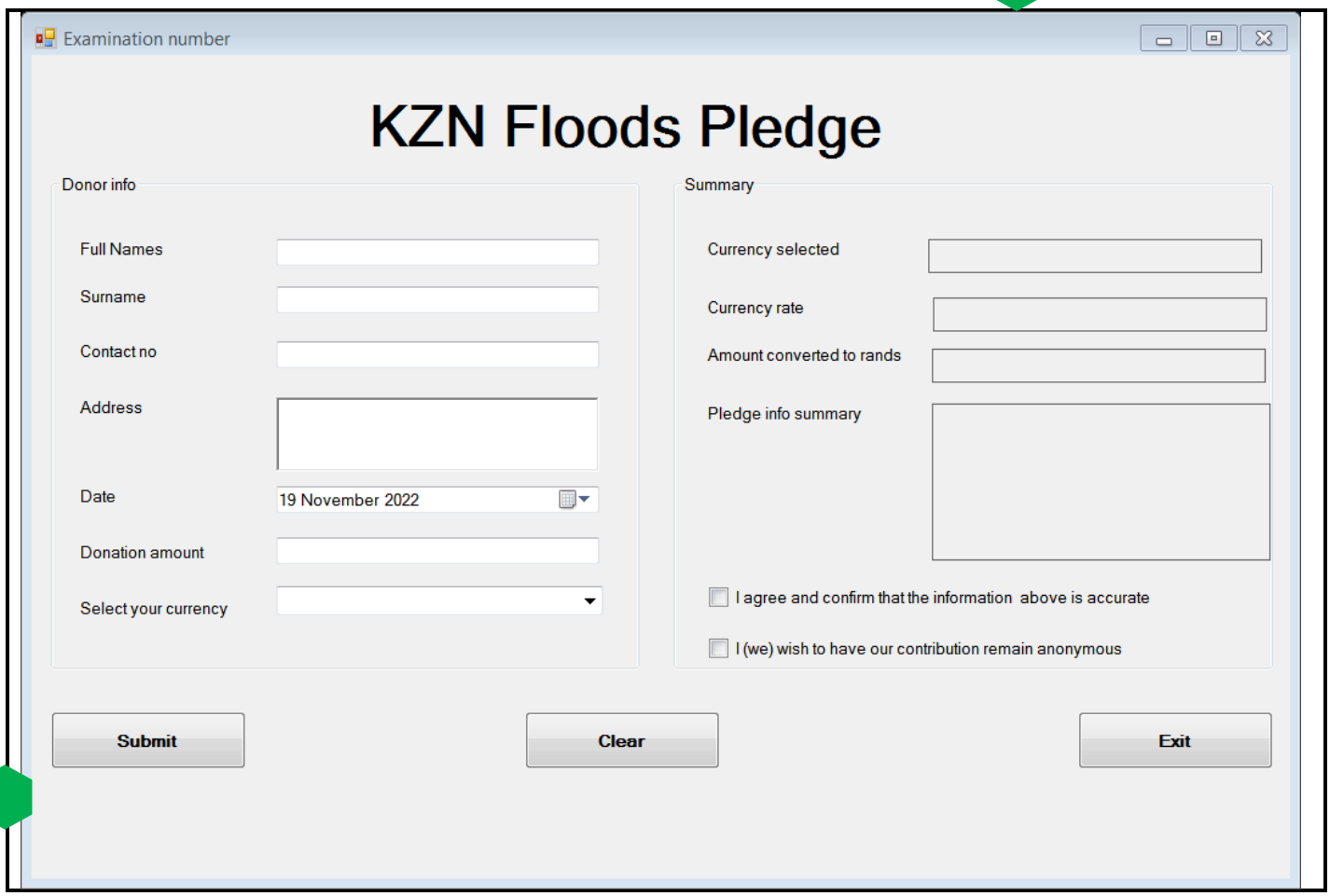
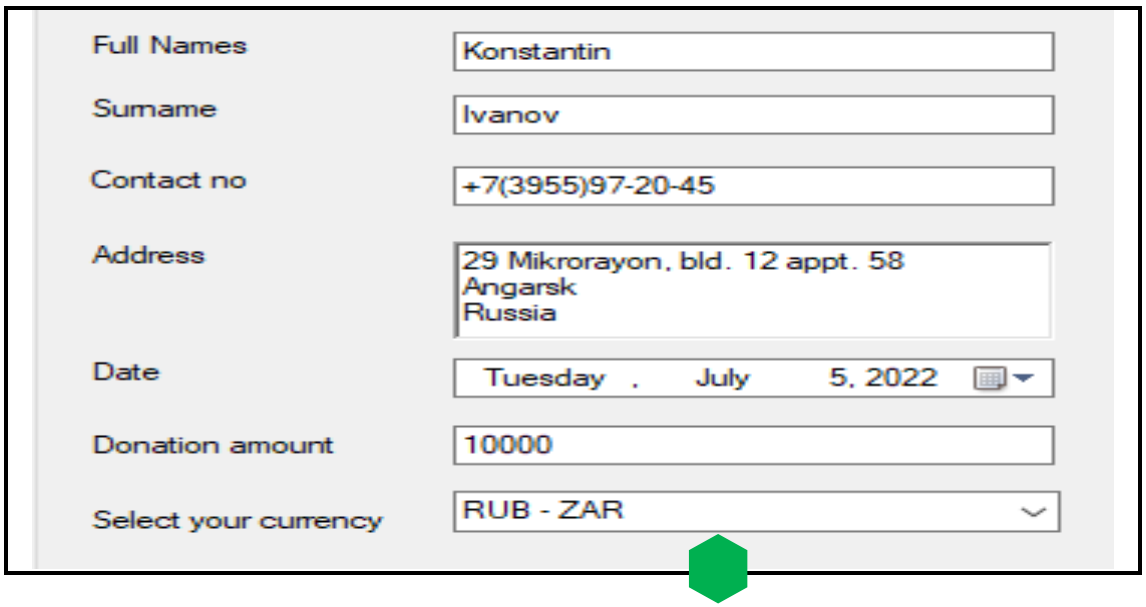


FIGURE 3

The following STEPS explain how to use the program:

STEP 1: Enter full names, surname, contact no, address, donation amount, and select date and currency.



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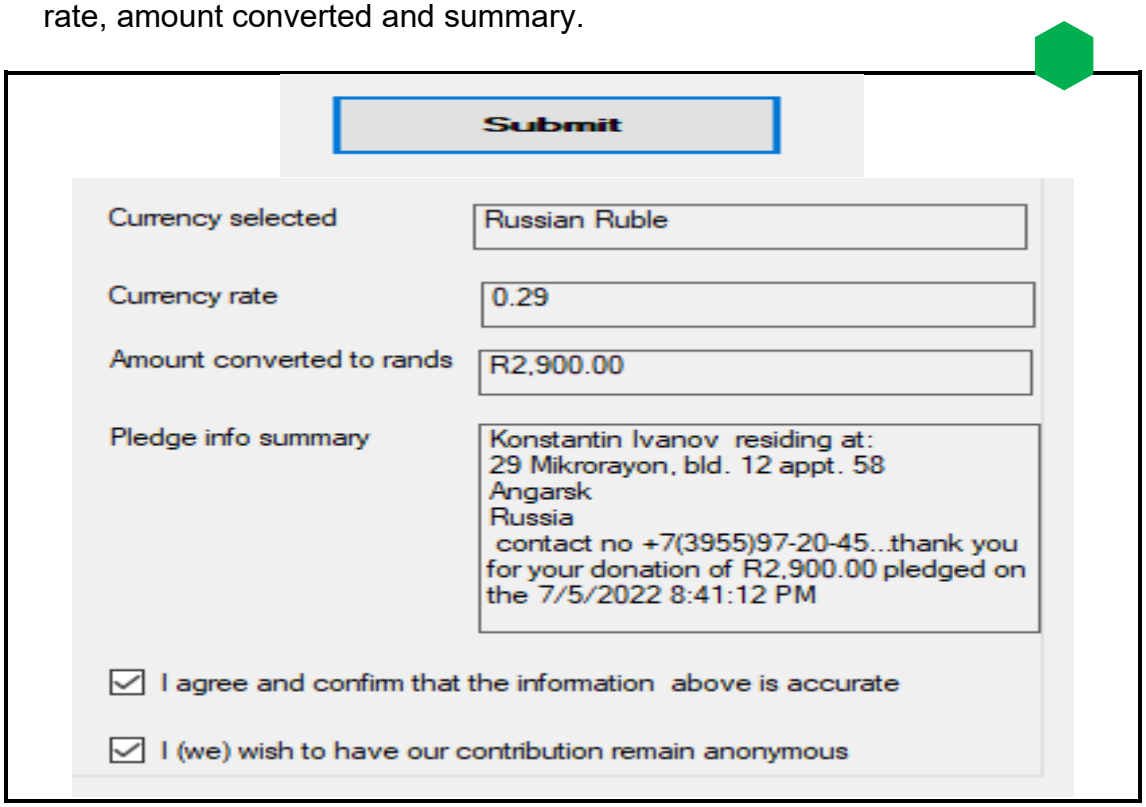
STEP 2: Click the *Submit* button to compute and display currency selected, currency rate, amount converted and summary.



The completed user interface has been saved on the hard drive. Open the solution, *KZNfloodsPledge,* and follow the instructions below to complete the program.

NOTE: Use the local variables provided. Change the form title bar to your EXAMINATION NUMBER.

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

3.2 Open the *selectedIndexChanged* event of the *Currency* combo box and add the following code.

3.2.1 Complete the partially completed *if statement* by assigning currency and currency rate to given variables. (3)

3.2.2 Display currency and currency rate on appropriate labels. (2)

3.3 Open the click event of the *Submit* button and add the following code.

3.3.1 Add code to assign address, date and donation amount to the appropriate variables. Note: The *DateTimePicker's* default date is the current date. (3)

3.3.2 Add a formula to calculate the amount converted. Refer to the IPO chart. (2)

3.3.3 Write code to display the summary on appropriate labels as indicated in FIGURE 6. (6)

NOTE: Format amount converted to South African currency.

3.4 Add code to clear all appropriate controls to the click event of the *Clear* button. (2)

3.5 Enter the following test data, and print the form as indicated in FIGURE 3.1.

Full names	Surname	Contact no	Address
Konstantin	Ivanov	+7(3955)97-20-45	29 Mikrorayon, bld. 12 appt, 58 Angarsk Russia

Date	Donation amount	Currency
Current date	10000	RUB

(2)

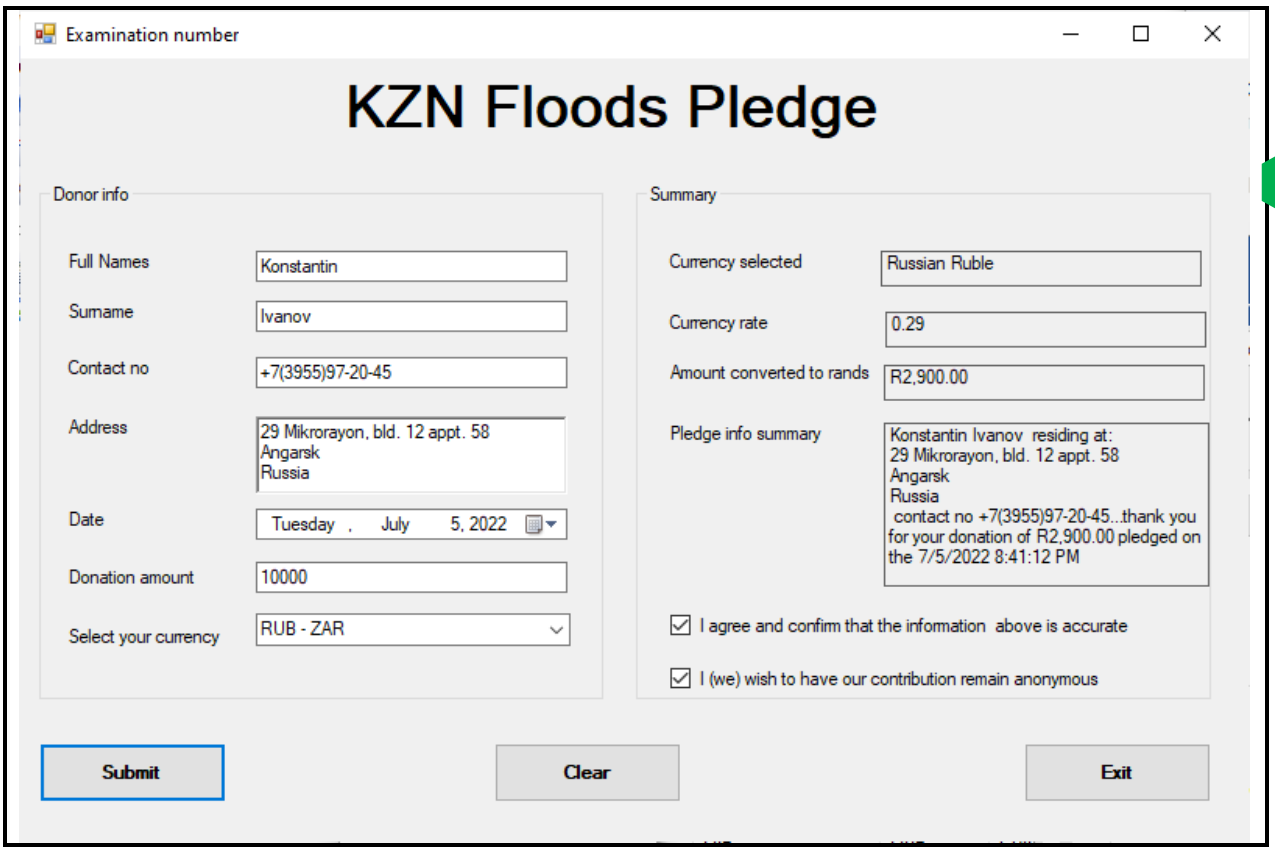


FIGURE 3.1

[21]

QUESTION 4

This question refers to the VB.NET solution, *fitness_assessment,* that has been saved on the hard drive.

A local school has recruited you to find and correct mistakes in their new program. The application uses the BMI to calculate and evaluate lean individuals who want to join rugby or wrestling. Each applicant receives a reference number that is made up of the last seven digits of their ID number and the first three letters of their last name.

The source code below comprises of syntax and run-time errors. Study the source code and answer the questions that follow.

```
Option Strict On
Public Class Form1
    Dim strSurname
    Dim lngIDno As Long
        intWeight As Integer
    Dim decHeight As Decimal
    Dim dblBMI As Double
    Dim dblAssessmentBMI As Double
    Dim strReference As String
    Dim strAssessmentResults As String

    Private Sub btnAssess_Click(ByVal sender As System.Object, ByVal e As
    System.EventArgs) Handles btnAssess.Click

        If txtIDno.Text = "" Then
           MessageBox("Enter your ID no", "Error", MessageBoxButtons.OK,
           MessageBoxIcon.Error)
            txtIDno.Focus()
            Exit Sub

            If txtIDno.TextLength <> 13 Then
                MessageBox.Show("Enter 13 digits", "Error", )

                txtIDno.Clear()
                txtIDno.Focus()
                Exit Sub
            End I

            If txtSurname.Text = "" Then
              MessageBox.Show("Enter surname and initials", "Error",
              MessageBoxButtons.OK, MessageBoxIcon.Error)
                txtSurname.Focus()
                Exit Sub
            End If

            If cmbSportingCodes.SelectedIndex < 0 Then
             MessageBox.Show("Select sporting code", "Error",
             MessageBoxButtons.OK, MessageBoxIcon.Error)
                cmbSportingCodes.DroppedDown =

            End If

            strSurname = txtSurname.Text
            Long.TryParse(txtIDno.Text, lngIDno)
            Integer.TryParse(CStr(nupWeight.Value), )
            Decimal.TryParse(CStr(txtHeight.Text), decHeight)
```

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```
            dblBMI = Math.Round(intWeight / (decHeight ^ 2))
           strReference = strSurname.ToString.Substring(0, 3) &
           lngIDno.ToString.Substring(6)

            Select Case cmbSportingCodes.SelectedIndex
                Case 0
                    dblAssessmentBMI = 18.5
                Case 1
                    dblAssessmentBMI = 20.5

                    If dblBMI < dblAssessmentBMI Then
                      strAssessmentResults = "Not successfull...Better luck
                      next time"
                    Else
                        strAssessmentResults = "Congratulations...you meet
                       minimum criteria"
                    End If

                    lblBMI.Text = dblBMI
                    lblReference.Text =
                    lblAssessment.Text = strAssessmentResults
    End Sub

Private Sub btnClear_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnClear.Click



        If MessageBox.Show("This will clear all fields", "Confirm",
        MessageBoxButtons.OKCancel, MessageBoxIcon.Information) =
        Windows.Forms.DialogResult.OK Then
            txtSurname
            txtIDno.Clear()
            nupWeight.ResetText()
            txtHeight.Clear()
            cmbSportingCodes.Text = ""
            lblBMI.clear()
            lblReference.Text = ""
            lblAssessment.Text = ""
            txtSurname.Focus()
        End If
    End Sub

Private Sub btnExit_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnExit.Click
         If MessageBox.Show("Terminate the program", "Exit",
         MessageBoxButtons.YesNo, MessageBoxIcon.Question) =
         Windows.Forms.DialogResult.Yes Then
            exit
        End If

End Class
```

NOTE: The *fitness_assessment* program saved on your hard drive contains errors. All errors must be fixed in order for the program to work properly and produce the desired output.

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4.1 Add your EXAMINATION NUMBER as a comment. (1)

4.2 Fix all errors in the program. (14)

4.3 Print the source code. (1)

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

4.5 Enter the following test data and print the forms as indicated in FIGURE 4.

Surname initials	ID number	Weight	Height	Sporting codes
Johnson K	9901145342082	70	1.7	Rugby

Surname initials	ID number	Weight	Height	Sporting codes
Mokoena P	9810154126082	45	1.5	Wrestling

(2)

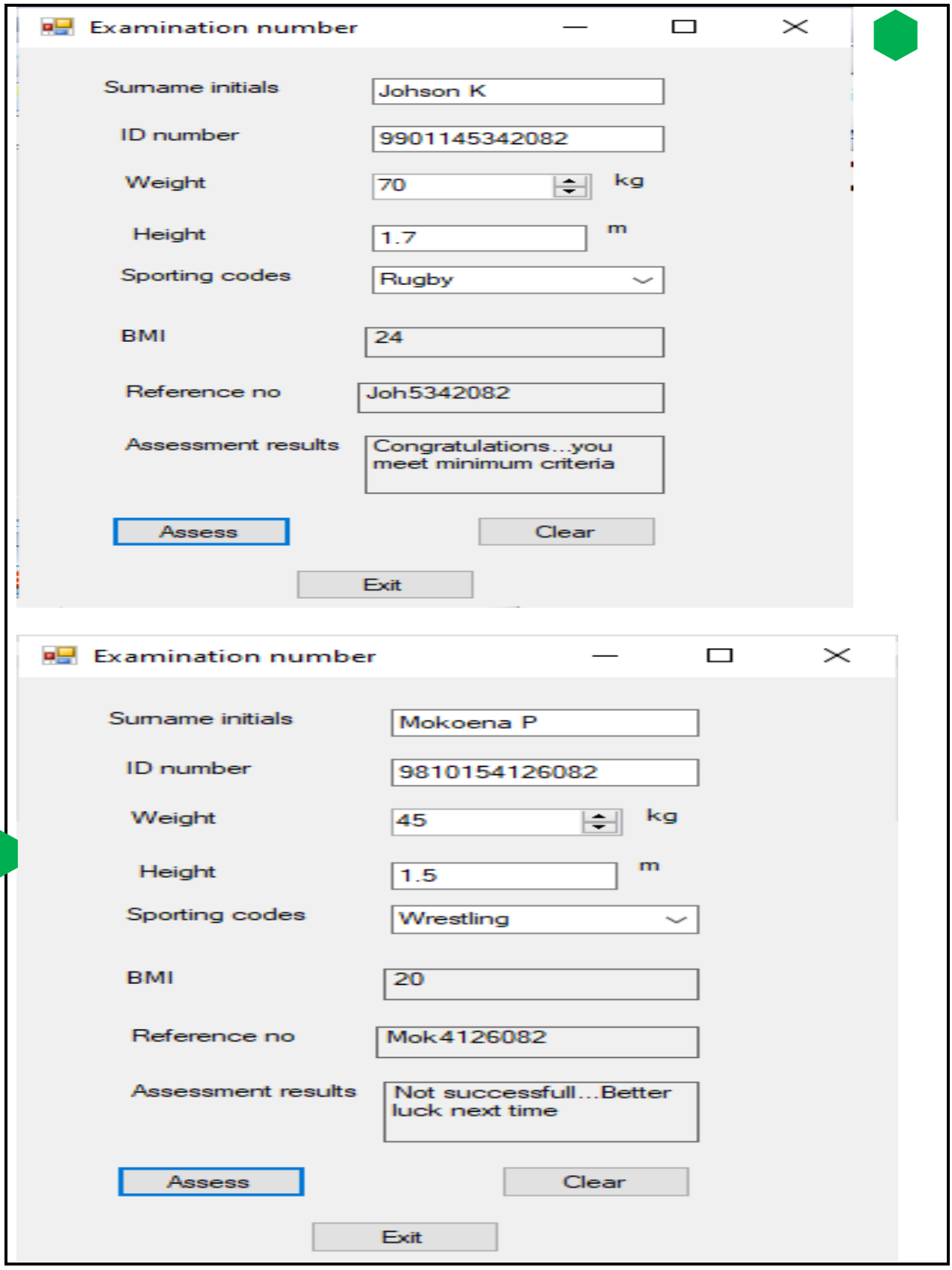

FIGURE 4

[19]

TOTAL: 100

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