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Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

INFORMATION TECHNOLOGY P1

NOVEMBER 2022

MARKS: 150

TIME: 3 hours

This question paper consists of 24 pages with 2 data pages.

INSTRUCTIONS AND INFORMATION

1. This paper is divided into FOUR sections. Candidates must answer ALL the questions in ALL FOUR sections.
2. The duration of this examination is three hours. Because of the nature of this examination, it is important to note that you will not be permitted to leave the examination room before the end of the examination session.
3. This question paper is set with programming terms that are specific to Delphi programming language. The Delphi programming language must be used to answer the questions.
4. Make sure that you answer the questions according to the specifications that are given in each question. Marks will be awarded according to the set requirements.
5. Answer only what is asked in each question. For example, if the question does not ask for data validation, then no marks will be awarded for data validation.
6. Your programs must be coded in such a way that they will work with any data and not just the sample data supplied or any data extracts that appear in the question paper.
7. Routines, such as search, sort and selection, must be developed from first principles. You may NOT use the built-in features of the Delphi programming language for any of these routines.
8. All data structures must be defined by you, the programmer, unless the data structures are supplied.
9. You must save your work regularly on the disk/CD/DVD/flash disk you have been given, or on the disk space allocated to you for this examination session.
10. Make sure that your examination number appears as a comment in every program that you code, as well as on every event indicated.
11. If required, print the programming code of all the programs/classes that you completed. Your examination number must appear on all the printouts. You will be given half an hour printing time after the examination session.
12. At the end of this examination session, you must hand in a disk/CD/DVD/flash disk with all your work saved on it OR you must make sure that all your work has been saved on the disk space allocated to you for this examination session. Ensure that all files can be read.

13. The files that you need to complete this question paper have been provided to you on the disk/CD/DVD/flash disk or on the disk space allocated to you. The files are provided in the form of password-protected executable files.

Do the following:

- Double click on the following password-protected executable file:
DataENGNov2022.exe
- Click on the 'Extract' button.
- Enter the following password: **#TIME4RRR&\$**

Once extracted, the following list of files will be available in the folder **DataENGNov2022**:

Question1:

Question1_P.dpr
Question1_P.dproj
Question1_P.res
Question1_U.dfm
Question1_U.pas

Question2:

CollectionDB.mdb
CollectionDB - Copy.mdb
ConnectDB_U.dcu
Question2_P.dpr
Question2_P.dproj
Question2_P.res
Question2_U.dfm
Question2_U.pas

Question3:

logo.jpeg
Question3_P.dpr
Question3_P.dproj
Question3_P.res
Question3_U.dfm
Question3_U.pas
SolarPowerPlant_U.pas

Question4:

Quest4_P.dpr
Quest4_P.dproj
Quest4_P.res
Quest4_U.dfm
Quest4_U.pas
rrr.jpeg

SECTION A**QUESTION 1: GENERAL PROGRAMMING SKILLS**

Do the following:

- Open the incomplete program in the **Question 1** folder.
- Enter your examination number as a comment in the first line of the **Question1_U.pas** file.
- Compile and execute the program. The program has no functionality currently.

Example of graphical user interface (GUI):

Question1 - General programming skills

Question 1.1

Panel

1.1 - Properties

Question 1.2

Select month:

1.2 - Leave month

Question 1.3

A:

B:

C:

1.3 - Calculate

Question 1.4

1.4 - Marks

Question 1.5

Dusty study

1.5 - Anagram

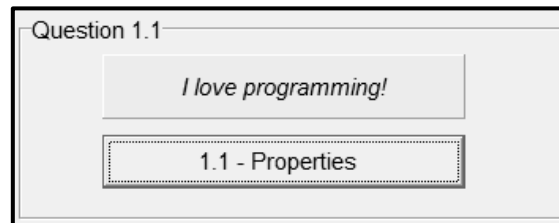
- Complete the code for each section of QUESTION 1, as described in QUESTION 1.1 to QUESTION 1.5 that follow.

1.1 Button [1.1 - Properties]

Write code to change the properties of panel **pnlQ1_1** as follows:

- Set the colour to yellow.
- Set the font to italics.
- Change the caption to 'I love programming!'.

Example of output:



(3)

1.2 Button [1.2 - Leave month]

An employee selects the month during which he/she wants to take leave. The company is closed from June to August and leave cannot be taken during this period of time.

The combo box **cmbQ1_2** has been populated with the names of the months from January to December.

The user must select a month from combo box **cmbQ1_2**.

Write code to do the following:

- Extract the month selected from combo box **cmbQ1_2**.
- If the company is open in the selected month, display a message on the label **lblQ1_2** using this format:

`"Your leave in " <month> " has been granted."`

- If the company is closed during the selected month, do the following:
 - Display a message on the label **lblQ1_2** using this format:

`"Company closed, select another month."`
 - Clear the selection of the month from combo box **cmbQ1_2**.

Example of output if April is selected:

Question 1.2

Select month: April

1.2 - Leave month

Your leave in April has been granted.

Example of output if July is selected:

Question 1.2

Select month:

1.2 - Leave month

Company closed, select another month.

(7)

1.3 Button [1.3 - Calculate]

The result of the following formula is required:

$$C = \sqrt{A^5 + \pi B^2}$$

The user must enter the values for A and B in the edit boxes provided.

Write code to do the following:

- Extract the value of A from edit box **edtQ1_3_1** and the value of B from edit box **edtQ1_3_2**.
- Use appropriate mathematical functions to calculate the value of C, using the formula provided.
- Display the truncated value of C in edit box **edtQ1_3_3**.

Example with the values of 3.15 (A) and 1.07 (B) as input and the result (C) as output:

Question 1.3

A: 3.15

B: 1.07

C: 17

1.3 - Calculate

(8)

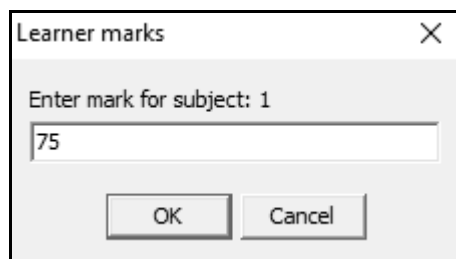
1.4 Button [1.4 - Marks]

The number of subjects that learners are enrolled for varies. The marks achieved by a learner for each subject must be entered, and the average mark must be calculated based on the number of marks that was entered.

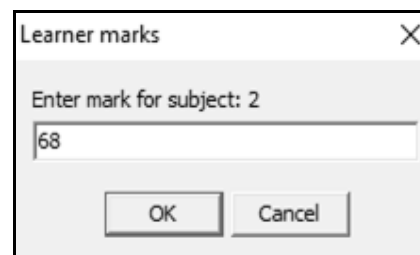
Write code to do the following:

- Allow the user to enter the marks achieved by a learner per subject, starting from subject number 1.
- Use a conditional loop and an input box to enter the marks. The loop must terminate when a mark of -1 is entered.
- As marks are entered, a numbered list of subjects and marks must be displayed in the **redQ1_4** output area, as shown in the examples that follow.
- After the loop for input has been terminated, calculate the average mark achieved by the learner. Display the average mark in the **redQ1_4** output area, formatted to TWO decimal places.

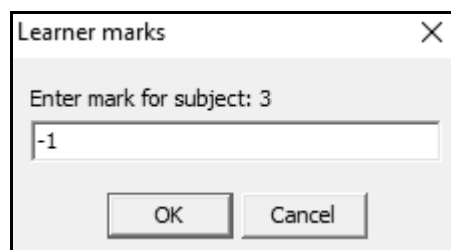
Example of input of marks:



A dialog box titled "Learner marks" with a close button (X) in the top right corner. It contains the text "Enter mark for subject: 1" above a text input field. The input field contains the number "75". At the bottom, there are two buttons: "OK" and "Cancel".



A dialog box titled "Learner marks" with a close button (X) in the top right corner. It contains the text "Enter mark for subject: 2" above a text input field. The input field contains the number "68". At the bottom, there are two buttons: "OK" and "Cancel".



A dialog box titled "Learner marks" with a close button (X) in the top right corner. It contains the text "Enter mark for subject: 3" above a text input field. The input field contains the number "-1". At the bottom, there are two buttons: "OK" and "Cancel".

Examples of output:

Marks for two subjects and the average:

```
Subject 1 : 75
Subject 2 : 68
Average mark: 71.50
```

Marks for eight subjects and the average:

```
Subject 1 : 81
Subject 2 : 55
Subject 3 : 92
Subject 4 : 56
Subject 5 : 49
Subject 6 : 80
Subject 7 : 72
Subject 8 : 73
Average mark: 69.75
```

(11)

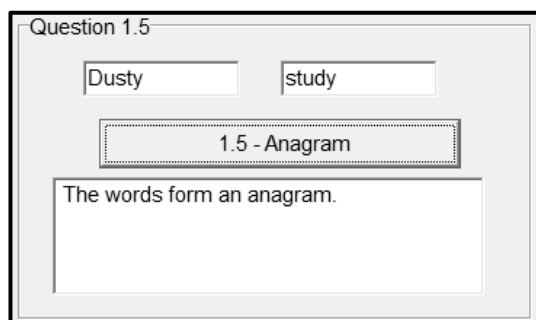
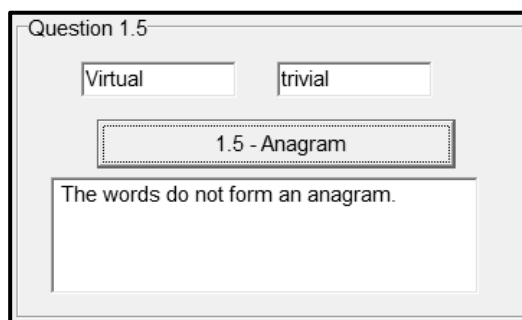
1.5 Button [1.5 - Anagram]

Two words must be analysed to determine whether the words form a perfect anagram or not. A perfect anagram is when another word is formed by rearranging the letters of the original word. For example, the word cat formed from the word act, peach from cheap and dusty from study.

Code has been provided to extract two words from edit boxes **edtQ1_5_1** and **edtQ1_5_2** and convert them to lower case.

Write code to determine whether the two words extracted from the edit boxes form an anagram or not and display a suitable message in memo **memQ1_5**.

Examples of input and output:

(11)

- Enter your examination number as a comment in the first line of the program file.
- Save your program.
- Print the code if required.

TOTAL SECTION A: 40

SECTION B**QUESTION 2: SQL AND DATABASE PROGRAMMING**

The Collect-a-Can recycling initiative has developed a database called **CollectionDB.mdb**, which contains information about the collection of cans from clients for the years 2020 to 2022.

An application is required that will use the **CollectionDB.mdb** database to manage the data and payments to clients who participate in the cash-for-cans initiative.

The database contains two tables called **tblClients** and **tblCanCollection**.

The data pages attached at the end of the question paper provide information on the design of the **CollectionDB.mdb** database and its contents.

Do the following:

- Open the incomplete project file called **Question2_P.dpr** in the **Question 2** folder.
- Enter your examination number as a comment in the first line of the **Question2_U.pas** unit file.
- Compile and execute the program. The program has no functionality currently. The contents of the tables are displayed as shown below on the selection of tab sheet **Question 2.2 - Delphi code**.

Question 2 - Database programming

Question 2.1 - SQL Question 2.2 - Delphi code

ClientID	ClientName	ClientSurname	Address	City
ABI10	Prashant	Govender	72 Mountain Road	Kimberley
BUS06	Busi	Nkosi	65 Donald Road	Welkom
CHR08	Chris	Ferreira	188 Richmond Street	Potchefstroom
DAM07	Damian	Coetzer	12 Cape Avenue	Durban

CollectionID	CollectionDate	NumberOfCans	Paid	ClientID
C001	2020/01/19	412	True	WIL12
C002	2020/03/21	300	False	GER01
C003	2020/03/23	599	True	WIL12
C004	2020/03/25	514	True	WIL12

Question 2.2.1

Insert

Question 2.2.2

Year:

☐ 2020 ☐ 2021 ☐ 2022

Percentage

Restore database Close

- Follow the instructions below to complete the code for each section as described in QUESTION 2.1 and QUESTION 2.2.
- Use SQL statements to answer QUESTION 2.1 and Delphi code to answer QUESTION 2.2.

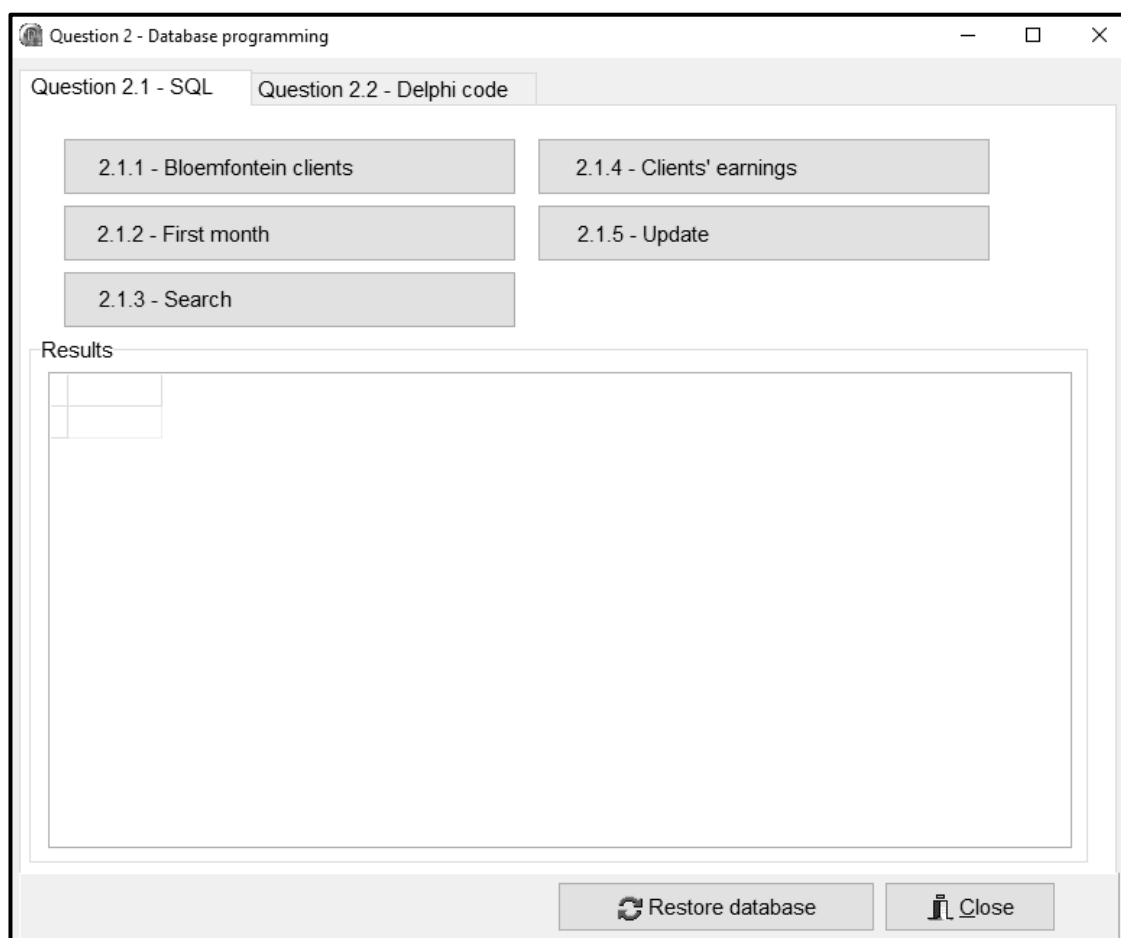
NOTE:

- The 'Restore database' button is provided to restore the data contained in the database to the original content.
- The content of the database is password-protected, i.e. you will NOT be able to gain access to the content of the database using Microsoft Access.
- Code is provided to link the GUI components to the database. Do NOT change any of the code provided.
- TWO variables are declared as public variables, as described in the table below.

Variable	Data type	Description
tblClients	TADOTable	Refers to the table tblClients
tblCanCollection	TADOTable	Refers to the table tblCanCollection

2.1 Tab sheet [Question 2.1 - SQL]

Example of graphical user interface (GUI) for QUESTION 2.1:



NOTE:

- Use ONLY SQL code to answer QUESTION 2.1.1 to QUESTION 2.1.5.
- Code to execute the SQL statements and display the results of the queries is provided. The SQL statements that will be assigned to the variables **sSQL1**, **sSQL2**, **sSQL3**, **sSQL4** and **sSQL5** are incomplete.

Complete the SQL statements to perform the tasks described in QUESTION 2.1.1 to QUESTION 2.1.5 below.

2.1.1 Button [2.1.1 - Bloemfontein clients]

Display all details of clients who live in Bloemfontein from the **tblClients** table, sorted according to the **ClientSurname** field.

Example of output:

ClientID	ClientName	ClientSurname	Address	City
JAC05	Jacob	Human	8 Human Street	Bloemfontein
PIE12	Piet	Mogorosi	5 Stormer Road	Bloemfontein
RHO09	Rhoda	Somers	14 Marilyn Way	Bloemfontein
GER01	Gert	Vermeulen	55 Dawn Street	Bloemfontein

(4)

2.1.2 Button [2.1.2 - First month]

Display the **CollectionID**, **CollectionDate** and **NumberOfCans** of collections made in January.

Example of output of the first five records:

CollectionID	CollectionDate	NumberOfCans
C001	2020/01/19	412
C031	2021/01/05	1000
C032	2021/01/10	450
C033	2021/01/16	2150
C034	2021/01/28	800

(3)

2.1.3 Button [2.1.3 - Search]

Code has been provided to enter a letter using an input box. The letter is saved in a variable called **sLetter**. Display ALL details of clients whose **ClientID** starts with the letter entered.

Example of output if the letter J was entered:

ClientID	ClientName	ClientSurname	Address	City
JOH03	Johan	Weston	43 Michellin Street	Vanderbijlpark
JAC05	Jacob	Human	8 Human Street	Bloemfontein

(4)

2.1.4 Button [2.1.4 – Clients' earnings]

Clients will receive R8,00 for each kilogram of cans collected. The company uses the formula: 1 kilogram = 76 cans.

Calculate and display the total amount that each client will receive for the cans they have collected, formatted to currency. Display the **ClientName** field and the total amount to receive, using the field name **Total Amount**.

Example of output of the first five records:

ClientName	Total Amount
Busi	R905.26
Chris	R1 173.47
Damian	R465.58
Gert	R661.68
Henry	R400.11

(8)

2.1.5 Button [2.1.5 - Update]

The details of a specific collection of cans were captured incorrectly.

Modify the details of record **C003** in the **tblCanCollection** table as follows:

- NumberOfCans: 250
- A payment was not made

Code has been provided to display a message that indicates that a record has been changed in the database.

(4)

2.2 Tab sheet [Question 2.2 - Delphi code]**NOTE:**

- Use ONLY Delphi programming code to answer QUESTION 2.2.1 and QUESTION 2.2.2.
- NO marks will be awarded for SQL statements in QUESTION 2.2.

Example of graphical user interface (GUI) for QUESTION 2.2:

Question 2 - Database programming

Question 2.1 - SQL Question 2.2 - Delphi code

ClientID	ClientName	ClientSurname	Address	City
ABI10	Prashant	Govender	72 Mountain Road	Kimberley
BUS06	Busi	Nkosi	65 Donald Road	Welkom
CHR08	Chris	Ferreira	188 Richmond Street	Potchefstroom
DAM07	Damian	Coetzer	12 Cape Avenue	Durban

CollectionID	CollectionDate	NumberOfCans	Paid	ClientID
C001	2020/01/19	412	True	WIL12
C002	2020/03/21	300	False	GER01
C003	2020/03/23	599	True	WIL12
C004	2020/03/25	514	True	WIL12

Question 2.2.1

Insert

Question 2.2.2

Year:

☐ 2020 ☐ 2021 ☐ 2022

Percentage

Restore database Close

2.2.1 Button [2.2.1 - Insert]

Write code to add a new record to the **tblClients** table. The details of the client are as follows:

Client ID: **CHA01**

Client name: **Charles**

Client surname: **du Boit**

Address: **24 Van Wouw Street**

City: **Cape Town**

Example of the first four records of the **tblClients** table which shows that the record of the new client has been added successfully to the table:

ClientID	ClientName	ClientSurname	Address	City
CHA01	Charles	du Boit	24 Van Wouw Street	Cape Town
CHR08	Chris	Ferreira	188 Richmond Street	Potchefstroom
DAM07	Damian	Coetzer	12 Cape Avenue	Durban
GER01	Gert	Vermeulen	55 Dawn Street	Bloemfontein

(4)

2.2.2 Button [2.2.2 - Percentage]

The company wants to calculate the number of cans collected by a specific client in a specific year as a percentage of the total number of cans collected by the company in that specific year.

The user must do the following:

- Select a client from the DBGrid by clicking on the record.
- Select a year from the radio group **rgpQ2_2_2**.

Code has been provided to extract the year selected from the radio group **rgpQ2_2_2**.

Use the **redQ2_2_2** output area to display the information listed below.

Write code to do the following:

- Display the name and surname of the client selected.
- Determine and display the total number of cans collected by the client for the year selected.
- Determine and display the total number of cans collected by the Collect-a-Can company for the year selected.
- Calculate which percentage of the total number of cans collected in the selected year, was collected by the client. Display the percentage formatted to two decimal places.

Example of output if the client record with ClientID **BUS06** and the year **2022** has been selected:

Busi Nkosi	
Client collected in 2022:	2000
Company collected in 2022:	21660
Percentage collected by client:	9.23%

Example of output if the client record with ClientID **CHR08** and the year **2021** has been selected:

Chris Ferreira	
Client collected in 2021:	5268
Company collected in 2021:	32687
Percentage collected by client:	16.10%

(13)

- Enter your examination number as a comment in the first line of the program file.
- Save your program.
- Print the code if required.

TOTAL SECTION B: 40

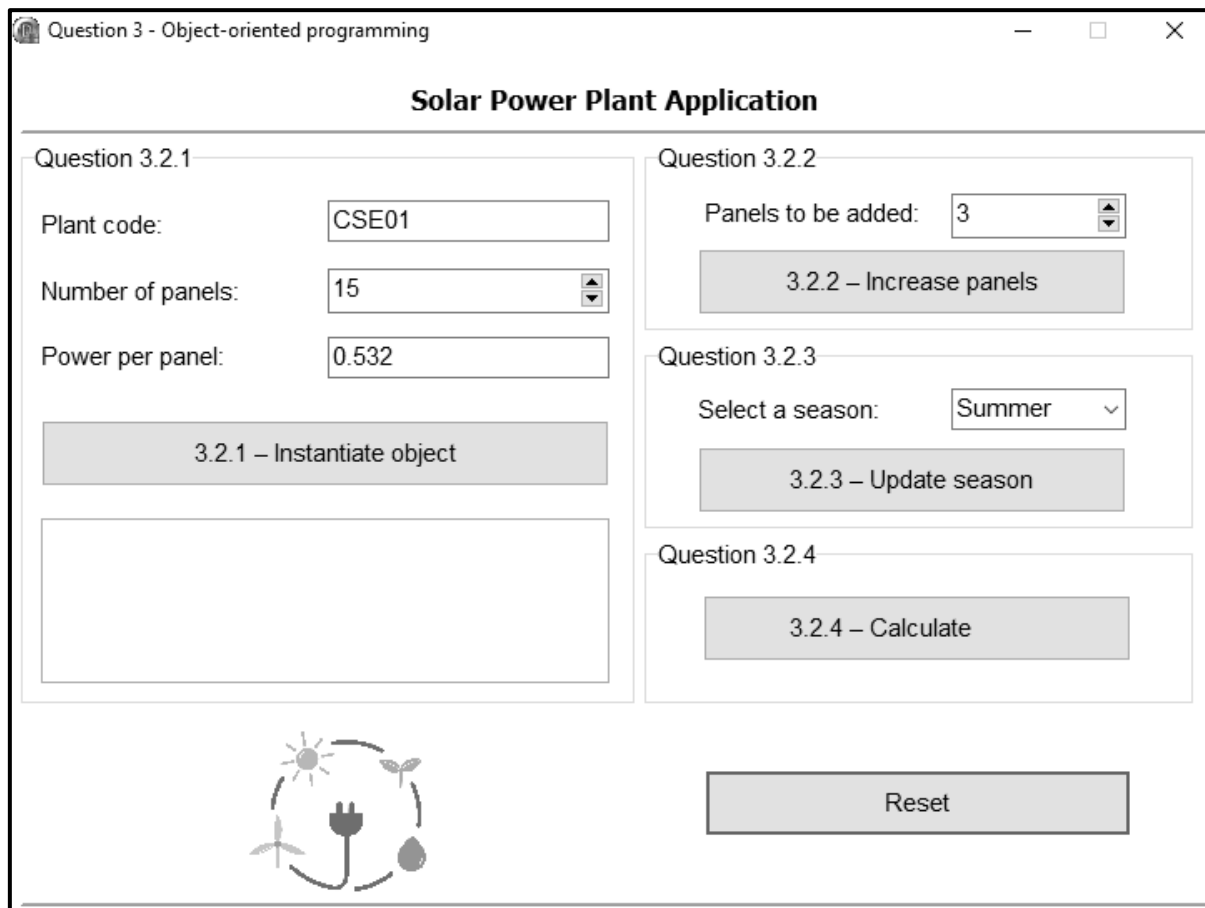
SECTION C**QUESTION 3: OBJECT-ORIENTATED PROGRAMMING**

The sustainable energy sector wants to keep track of the solar power plants in the country and their capacity to increase the power that they generate.

Do the following:

- Open the incomplete program in the **Question 3** folder.
- Open the incomplete object class **SolarPowerPlant_U.pas**.
- Enter your examination number as a comment in the first line of both the **Question3_U.pas** file and the **SolarPowerPlant_U.pas** file.
- Compile and execute the program. The program has limited functionality currently.

Example of graphical user interface (GUI):



- Complete the code as specified in QUESTION 3.1 and QUESTION 3.2 that follow.

NOTE: You are NOT allowed to add any additional attributes or user-defined methods, unless explicitly stated in the question.

- 3.1 The provided incomplete object class (**TSolarPowerPlant**) contains the declaration of four attributes which describe a **SolarPowerPlant** object.

The attributes for a **SolarPowerPlant** object have been declared as follows:

Attribute	Description
fPlantCode	A unique code for the solar power plant
fNumberOfPanels	The number of panels installed at the plant
fPowerPerPanel	The maximum power per panel in kilowatt-hour (kWh)
fSeason	The season during which power will be generated – Summer, Autumn, Winter, Spring

Code has been provided for the following accessor methods:

- **getPlantCode** to return the fPlantCode attribute
- **getNumOfPanels** to return the fNumberOfPanels attribute
- **getSeason** to return the fSeason attribute

Complete the code in the object class as described in QUESTION 3.1.1 to QUESTION 3.1.5 below.

- 3.1.1 Write code for a **constructor** method that will receive the plant code, the number of panels and the power per panel as parameters. Assign the parameter values to the respective attributes. Assign the default value 'Summer' to the season attribute. (5)
- 3.1.2 Write the code for a method called **incNumOfPanels** that receives a value as parameter and increments the **fNumberOfPanels** attribute by the value received. (4)
- 3.1.3 Write code for a mutator method called **setSeason** that receives a value as a parameter and sets the **fSeason** attribute to the value received. (3)
- 3.1.4 Write a method called **calculateCapacity** that uses the information that follows to calculate the power generation capacity of the installed panels at the company in the current season. Return the result as a real value.

The season determines the hours of sunlight per day that can be used to generate solar power, as shown in the following table:

SEASON	HOURS OF SUNLIGHT PER DAY
Summer	10
Autumn	8
Winter	6
Spring	8

The formula to calculate the generation capacity (GC) of the solar power plant is as follows:

$$GC = \text{NumberOfPanels} \times \text{PowerPerPanel} \times \text{HoursPerDay} \quad (8)$$

- 3.1.5 Write a **toString** method to return a string with all the attributes of the object in the following format:

```
Plant code: <PlantCode>
Number of panels: <NumberOfPanels>
Power per panel: <PowerPerPanel>
Season: <Season>
```

(3)

- 3.2 An incomplete program has been supplied in the **Question 3** folder. The program contains code for the object class to be accessible and declares an object variable called **objPlant**.

Write code to perform the tasks described in QUESTION 3.2.1 to QUESTION 3.2.4 below.

3.2.1 Button [3.2.1 - Instantiate object]

Write code to do the following:

- Extract the plant code from the edit box **edtQ3_2_1_Code**, the number of panels from the spin edit **sedQ3_2_1** and the power per panel from the edit box **edtQ3_2_1_Power**.
- Use the information to instantiate a new **SolarPowerPlant** object.
- Use the **toString** method to display the information of the **SolarPowerPlant** object in the rich edit **redQ3**.

Example of input and output:

(6)

3.2.2 Button [3.2.2 - Increase panels]

As the need for more power arises, panels can be added to increase the plant's power generation capacity.

Write code to do the following:

- Extract the value of the number of panels to be added from the spin edit **sedQ3_2_2**.
- Call the **incNumOfPanels** method with the value from the spin edit as argument.
- Call the relevant object methods to display the following in the rich edit **redQ3**:
 - The plant code
 - The number of panels after increasing the attribute value

Example of input and output:

Question 3.2.2

Panels to be added: 3

3.2.2 - Increase panels

Plant code: CSE01
Number of panels: 18

(4)

3.2.3 Button [3.2.3 - Update season]

The number of hours for the generation of power differs per season.

The user must select the season from the combo box **cmbQ3_2_3**.

Write code to do the following:

- Extract the season selected from the combo box **cmbQ3_2_3**.
- Call the **setSeason** method using the value from the combo box as an argument.
- Use the **toString** method to display the information of the updated **Plant** object in the rich edit **redQ3**.

Example of input and output:

Question 3.2.3

Select a season:

3.2.3 – Update season

Plant code: CSE01
 Number of panels: 18
 Power per panel: 0.532
 Season: Winter

(3)

3.2.4 Button [3.2.4 - Calculate]

The maximum capacity of power that can be generated by the panels must be calculated.

Write code to display the following in the rich edit **redQ3**:

- The season as a part of the output string.
- The result of the **calculateCapacity** method converted into a string. The unit 'kW' must also be displayed.

Example of output:

The maximum generation capacity per day in
 Winter:
 57.456 kW

(4)

- Enter your examination number as a comment in the first line of the object class and the form class.
- Save your program.
- Print the code in the object class and the form class if required.

TOTAL SECTION C: 40

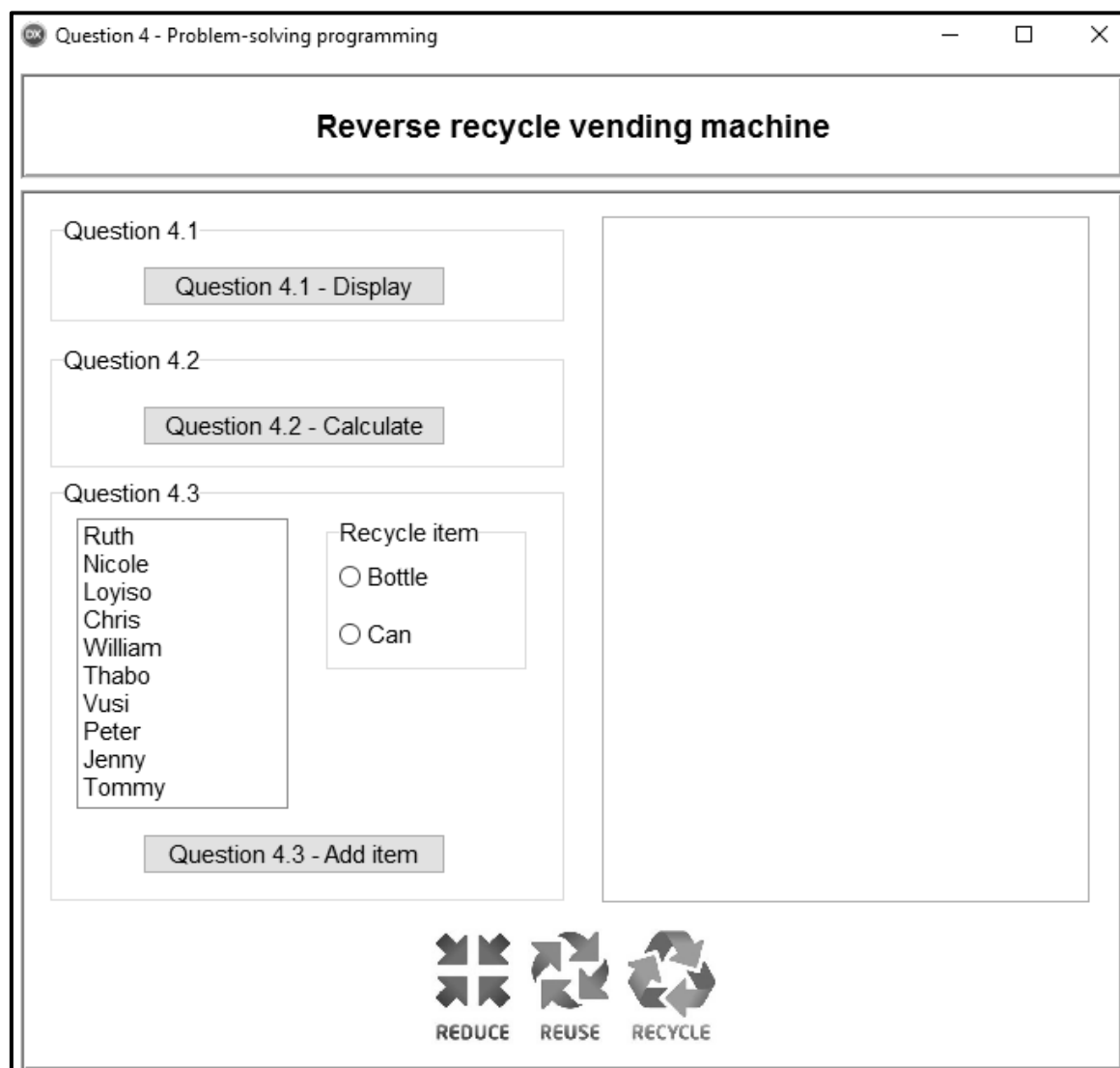
SECTION D**QUESTION 4: PROBLEM-SOLVING PROGRAMMING**

Vending machines can be used to dispense items such as sweets, chips, cool drinks, etc. A reverse vending machine can be used for recycling purposes. Your school wants to use reverse vending machines on the school grounds to recycle bottles and cans. A learner will deposit/insert a number of bottles or cans into the reverse vending machine and will then be remunerated. One of the reverse vending machines will be tested in a class with 10 learners.

Do the following:

- Open the incomplete program in the **Question 4** folder.
- Enter your examination number as a comment in the first line of the **Quest4_U.pas** file.
- Compile and execute the program. The program has no functionality currently.

Example of graphical user interface (GUI):



The following arrays have been provided in the program:

- An array **arrNames** which contains the names of ten learners in a class:

```
arrNames: array [1 .. 10] of String = (
    'Ruth', 'Nicole', 'Loyiso', 'Chris', 'William',
    'Thabo', 'Vusi', 'Peter', 'Jenny', 'Tommy');
```

- A two-dimensional array, **arrVending**, that stores the type of items that were recycled by the learners. The array is partially populated and allows for up to 15 items to be recycled by each of the 10 learners in the class:

```
arrVending: array [1 .. 10, 1 .. 15] of String =
    (('C', '', '', '', '', '', '', '', '', '', '', '', '', ''),
     ('B', 'B', 'B', 'C', 'C', 'C', 'B', 'B', 'B', 'C', 'C', 'C', 'C',
     'C', ''),
     ('', '', '', '', '', '', '', '', '', '', '', '', '', ''),
     ('C', 'C', '', '', '', '', '', '', '', '', '', '', '', ''),
     ('B', 'B', 'C', 'C', 'B', 'B', 'C', 'C', 'C', 'C', 'B', 'C', 'C',
     'B', ''),
     ('C', 'C', 'B', '', '', '', '', '', '', '', '', '', '', ''),
     ('C', 'B', '', '', '', '', '', '', '', '', '', '', '', ''),
     ('B', 'B', '', '', '', '', '', '', '', '', '', '', '', ''),
     ('C', '', '', '', '', '', '', '', '', '', '', '', '', ''),
     ('B', 'C', '', '', '', '', '', '', '', '', '', '', '', ''));
```

Complete the code for each section of QUESTION 4, as described in QUESTION 4.1 to QUESTION 4.3 below.

4.1 Button [4.1 - Display]

The names of learners are provided in array **arrNames**. A corresponding list of items that have been recycled for each learner, has been provided in the array **arrVending**.

The items in array **arrVending** are represented using the letters 'B' or 'C' where 'B' represents a bottle and 'C' represents a can.

Code has been provided to display the heading.

Write code to display the content of arrays **arrNames** and **arrVending** in the following format:

```
<Name><tab><recycled item><recycled item><recycled item>...
```

Example of output:

Names	Items recycled
Ruth	C
Nicole	BBBCCCBBCCCCC
Loyiso	
Chris	CC
William	BBCCBBCCCCBCCB
Thabo	CCB
Vusi	CB
Peter	BB
Jenny	C
Tommy	BC

(5)

4.2 Button [4.2 - Calculate]

Learners using the vending machine for recycling items will be paid for each item as follows:

ITEM RECYCLED	AMOUNT PAID
Bottle (B)	R2.15
Can (C)	R0.75

Write code to display the following in the rich edit **redQ4**:

- The name of each learner and the total amount each learner will be paid for the bottle and can items that the learner put into the vending machine.
- The name(s) of the learner(s) that will receive the highest amount.

Example of output:

Names	Total amount paid
Ruth	R0.75
Nicole	R18.90
Loyiso	R0.00
Chris	R1.50
William	R18.90
Thabo	R3.65
Vusi	R2.90
Peter	R4.30
Jenny	R0.75
Tommy	R2.90
Highest payout(s):	
Nicole	R18.90
William	R18.90

(14)

4.3 Button [4.3 - Add item]

The user must do the following when a learner wants to add an item to be recycled:

- Select the name of the learner from the list box **lstQ4**.
- Select the type of item to be added for recycling from the radio group **rgpQ4**.

The bottle or can item selected must then be added to the next available empty space in array **arrVending** at the index corresponding to the name of the learner selected. A suitable message must be displayed if the vending space for the specified learner is full.

Write code to do the following:

- Extract the name of the learner from the list box **lstQ4** and the item that needs to be recycled from the radio group **rgpQ4**.
- Display a suitable message when neither the name nor the item has been selected.
- If there is an empty space available in the array for the specified learner:
 - Add the recycled item selected (B or C) to the array **arrVending** at the correct index for the learner selected.
 - Display the contents of the array **arrNames** and the updated array **arrVending** after each item has been added.
- If there is no space available in the array for the specified learner, display a suitable message to indicate that the vending machine is full.

Example of output when a name or item has not been selected:

Please select both a name and an item.

OK

Example of output when the name 'Nicole' and the item 'Bottle' were selected:

Question 4.3

- Ruth
- Nicole
- Loyiso
- Chris
- William
- Thabo
- Vusi
- Peter
- Jenny
- Tommy

Recycle item

☒ Bottle

☐ Can

Question 4.3 - Add item

Names	Items recycled
Ruth	C
Nicole	BBBCCBBBCCCCCB
Loyiso	
Chris	CC
William	BBCCBBCCCCBCCB
Thabo	CCB
Vusi	CB
Peter	BB
Jenny	C
Tommy	BC

Example of output when an attempt was made to add another item for the name 'Nicole':



(11)

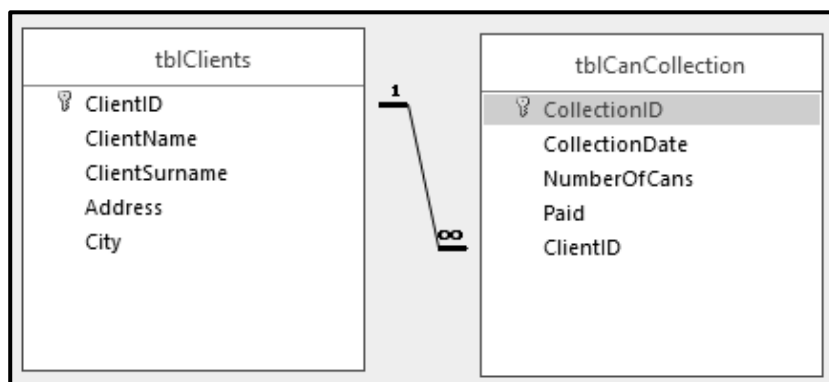
- Enter your examination number as a comment in the first line of the program file.
- Save your program.
- Print the code if required.

TOTAL SECTION D:	30
GRAND TOTAL:	150

INFORMATION TECHNOLOGY P1**DATABASE INFORMATION QUESTION 2:**

The database **CollectionDB** consists of table **tblClients** and **tblCanCollection**.

The following one-to-many relationship with referential integrity exists between the two tables in the database:



The design of the database tables is as follows:

Table: **tblClients**

This table contains details of the clients.

Field name	Data type	Description
ClientID	Text (5)	Unique ID for the client
ClientName	Text (15)	The name of the client
ClientSurname	Text (15)	The surname of the client
Address	Text (20)	The address of the client used for the pickup of cans
City	Text (15)	The city where the client resides

Example of the records in the **tblClients** table:

ClientID	ClientName	ClientSurname	Address	City
ABI10	Prashant	Govender	72 Mountain Road	Kimberley
BUS06	Busi	Nkosi	65 Donald Road	Welkom
CHR08	Chris	Ferreira	188 Richmond Street	Potchefstroom
DAM07	Damian	Coetzer	12 Cape Avenue	Durban
GER01	Gert	Vermeulen	55 Dawn Street	Bloemfontein
HEN11	Henry	Marques	1 Kingsley Drive	Cape Town
JAC05	Jacob	Human	8 Human Street	Bloemfontein
JOH03	Johan	Weston	43 Michellin Street	Vanderbijlpark
PHI04	Phillip	Brown	11 Park Road	Sasolburg
PIE12	Piet	Mogorosi	5 Stormer Road	Bloemfontein
RHO09	Rhoda	Somers	14 Marilyn Way	Bloemfontein
WIL12	Willem	de Wit	2 Arrow Street	Sasolburg

Table: **tblCanCollection**

This table contains information of all the collections.

Field name	Data type	Description
CollectionID	Text (5)	Unique code for each collection
CollectionDate	Date/Time	Date of the collection
NumberOfCans	Number	Integer value that indicates the number of cans collected
Paid	Boolean	A Boolean value that indicates that the client received payment for the cans collected
ClientID	Text (5)	The ID of the client who collected the cans

Example of the first ten records in the **tblCanCollection** table:

CollectionID ▾	CollectionDate ▾	NumberOfCans ▾	Paid ▾	ClientID ▾
C001	2020/01/19	412	<input checked="" type="checkbox"/>	WIL12
C002	2020/03/21	300	<input type="checkbox"/>	GER01
C003	2020/03/23	599	<input checked="" type="checkbox"/>	WIL12
C004	2020/03/25	514	<input checked="" type="checkbox"/>	WIL12
C005	2020/03/26	1200	<input type="checkbox"/>	CHR08
C006	2020/03/30	480	<input type="checkbox"/>	DAM07
C007	2020/04/02	511	<input checked="" type="checkbox"/>	GER01
C008	2020/04/15	200	<input type="checkbox"/>	BUS06
C009	2020/04/17	419	<input type="checkbox"/>	DAM07
C010	2020/04/24	500	<input checked="" type="checkbox"/>	CHR08

NOTE:

- Connection code has been provided.
- The database is password-protected, therefore you will not be able to access the database directly.