



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2017

INFORMATION TECHNOLOGY P1

MARKS: 150

TIME: 3 HOURS

This question paper consists of 11 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Candidates must answer ALL four questions.
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. 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.
4. 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.
5. Routines such as search, sort and selection must be developed from first principles. You may NOT use the built-in features of a programming language for any of these routines.
6. Save your work regularly.
7. The files that you need to complete this question paper have been given to you. The files are provided in the form of password-protected executable files.

Do the following:

- Double click on the password-protected executable file.
- Click on the extract button.
- Enter the following password: **Prod#17&**

Once extracted, the following list of files will be available in the folder **DataNov2017**:

Question 1:

Question1P.dpr
Question1P.dproj
Question1U.dfm
Question1U.pas

Question 2:

Question2P.dpr
Question2P.dproj
Question2U.dfm
Question2U.pas
Cast.txt

Question 3:

Question3P.dpr
Question3P.dproj
Question3U.dfm
Question3U.pas

Question 4:

Question4P.dpr
Question4P.dproj
Question4U.dfm
Question4U.pas
Helpers.mdb

SCENARIO

One of the schools in your area is organising their annual drama production. There is a lot of different organisational tasks that must take place before the actors and actresses can perform on stage.

In this question paper, you will have to assist with completing programs to perform different functions.

QUESTION 1: GENERAL PROGRAMMING SKILLS, TEXT FILES

The user is expected to enter information in order to book seats for the drama production.

The user must enter the tickets they would like to purchase. Once the tickets have been purchased they can then choose their seats on the evening. The first 30 tickets have been reserved for the VIP guests. VIPs have been invited, so they will not be paying for their tickets.

Ticket prices are as follows:

Adults – R80

Children – R50

Pensioners – R50

If the VIP option is selected, then an Inputbox component must be used to ask the user how many VIPs will be attending.

Assume that ticket sales will be made either as a VIP or as an adult/child/pensioner and NOT a combination of both.

Ticket numbers must be allocated. VIP tickets will be starting at ticket number 1 and all other tickets will start at 31.

As this is the main fundraiser for the drama department, there will be no limits on ticket sales.

The following information must be displayed in the output component:

- Heading ('SCHOOL PRODUCTION' and on the next line 'Show: GALA NIGHT')
- Cost of the tickets purchased formatted to currency and two decimal places
- The ticket numbers allocated

The following information must be written to a text file ('sales.txt'). It must **only** store the latest information. The first line will be the total amount of tickets sold and the second line will be the total amount of money received, formatted to currency and two decimal places). Display a message to show that the information has been written to the file.

Clear button:

The output component must be cleared and the spinedit components must be set so that the default value is 0. The VIP checkbox should not be selected.

The user is expected to enter information in order to book seats for the drama production.

The user must enter the tickets they would like to purchase. Once the tickets have been purchased they can then choose their seats on the evening. The first 30 tickets have been reserved for the VIP guests. VIPs have been invited, so they will not be paying for their tickets.

Ticket prices are as follows:

Adults – R80

Children – R50

Pensioners – R50

If the VIP option is selected, then an Inputbox component must be used to ask the user how many VIPs will be attending.

Assume that ticket sales will be made either as a VIP or as an adult/child/pensioner and NOT a combination of both.

Ticket numbers must be allocated. VIP tickets will be starting at ticket number 1 and all other tickets will start at 31.

As this is the main fundraiser for the drama department, there will be no limits on ticket sales.

The following information must be displayed in the output component:

- Heading ('SCHOOL PRODUCTION' and on the next line 'Show: GALA NIGHT')
- Cost of the tickets purchased formatted to currency and two decimal places
- The ticket numbers allocated

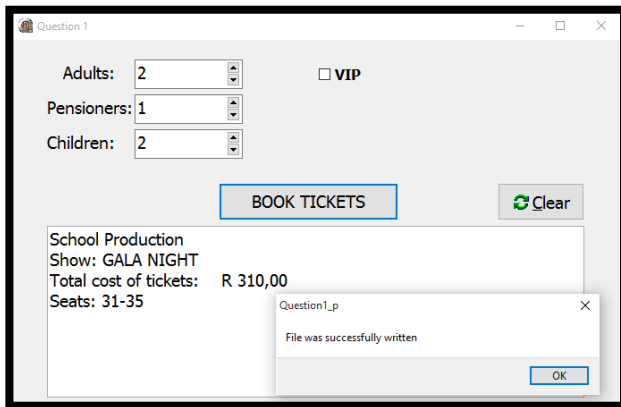
The following information must be written to a text file ('sales.txt'). It must **only** store the latest information. The first line will be the total amount of tickets sold and the second line will be the total amount of money received, formatted to currency and two decimal places). Display a message to show that the information has been written to the file.

Clear button:

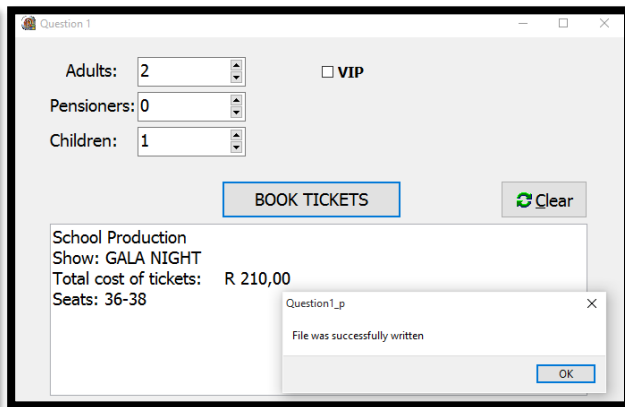
The output component must be cleared and the spinedit components must be set so that the default value is 0. The VIP checkbox should not be selected.

Example of output if four purchases were made:

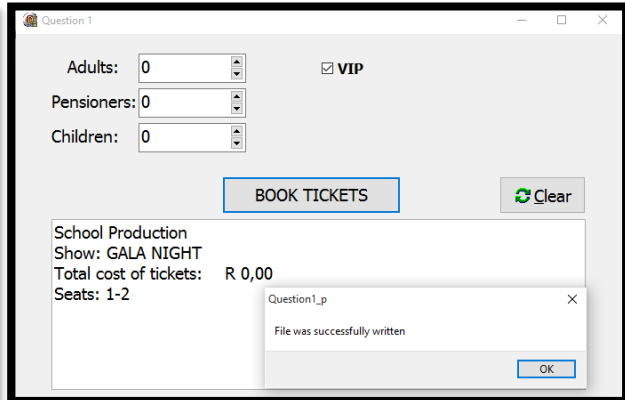
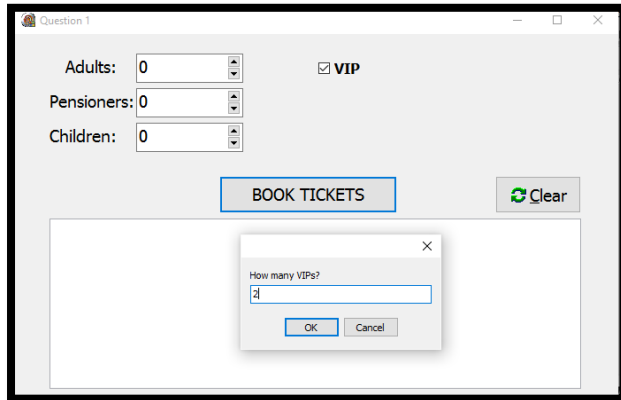
First purchase:



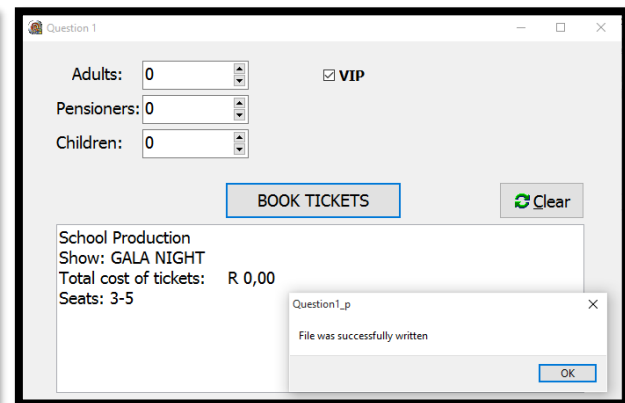
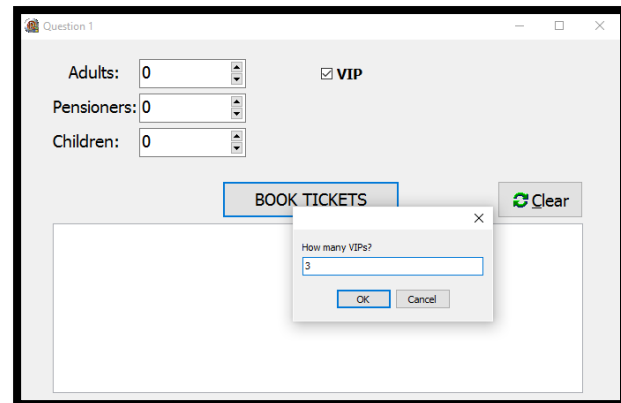
Second purchase:



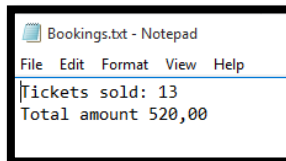
Third Purchase:



Fourth Purchase:



Text File after purchases were made:



- Enter your name and surname as a comment in the first line of the program file.
- Save your program.
- A printout of the code may be required.

TOTAL QUESTION 1: [32]

QUESTION 2: TEXT FILES, ARRAYS

The names and surnames of all the learners who are involved in the production are stored in the text file named **cast.txt**.

Their involvement is also listed (S1 – referring to Scene 1; S2 – referring to Scene 2; S1S2 – indicates that the learner is in both Scenes; Technical – part of the technical crew; Backstage – part of the backstage crew)

```
Lara Van Der Merwe-S1
Martin Kotze-S1S2
Melissa Botha-S2
Shaun Marais-Technical
John Sabbagh-Technical
Brad Smith-Backstage
Amy Logan-S1
Sarah Cooper-S1
Jonathan Lewis-S2
Daniel Savage-S1S2
Sheldon Rademeyer-Backstage
```

- 2.1 Write code for the **OnCreate EventHandler** of the **Form** which will read the contents from the text file. The information must be separated and stored in three arrays (arrnames, arrsurnames and arrscenes) which can store up to 100 items and declared with class scope.

If the text file does not exist, a suitable message must be displayed and the program must be closed.

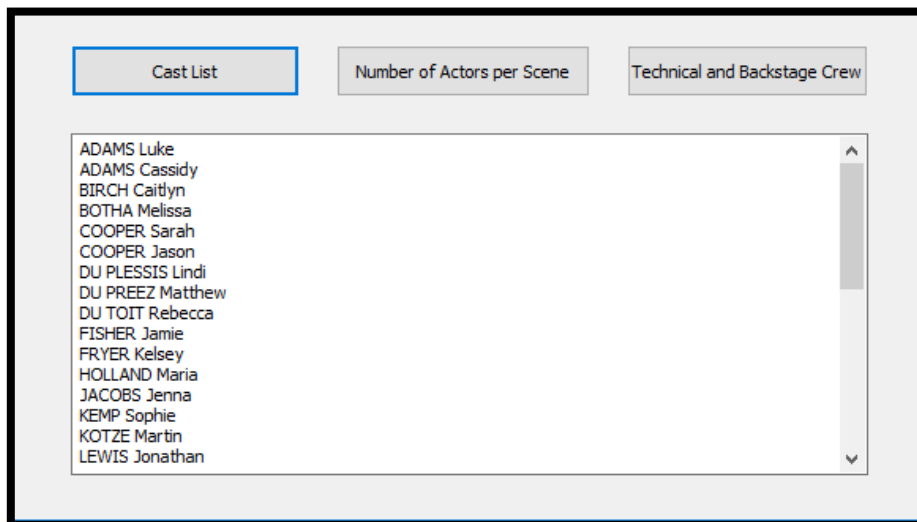
(22)

- 2.2 Write a method, named **Sort**, which will sort all the information according to the surnames, in alphabetical order.

(9)

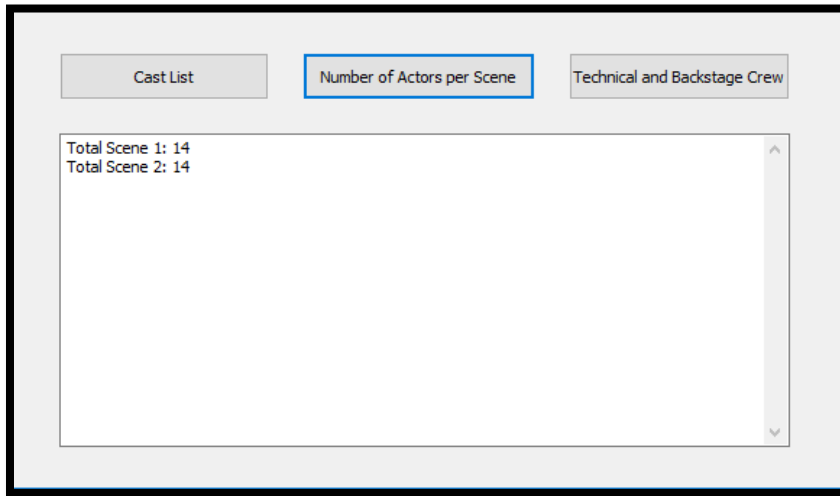
- 2.3 Write code for the **Cast List** button which will call the Sort method. Display the list of learners: surnames in capital letters followed by the name.

Example of output:



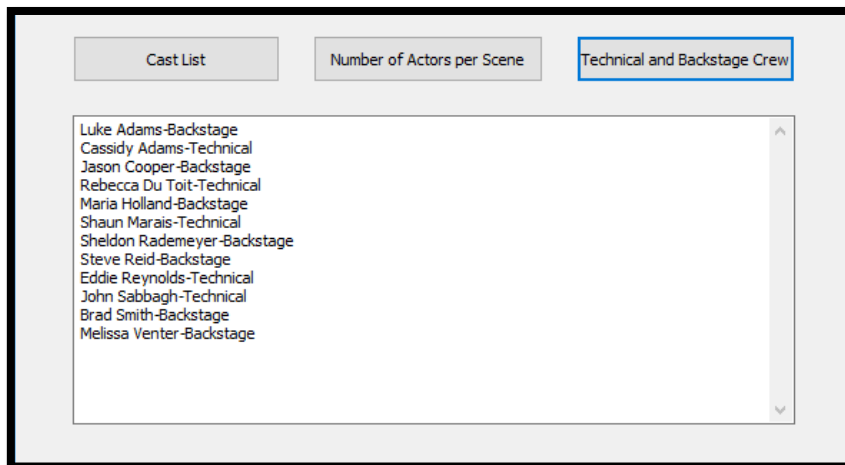
(4)

2.4 Write code for the **Number of Actors per Scene** button which will display the number of actors in each scene.



(8)

2.5 Write code for the **Technical and Backstage Crew** button which will display an alphabetical list of the learners, according to their surname, who are involved with either Backstage or Technical.



(6)

- Enter your name and surname as a comment in the first line of the program file.
- Save your program.
- A printout of the code may be required.

TOTAL QUESTION 2: [49]

QUESTION 3: SUBPROGRAMS

In order to be entered for a local competition, one must submit documents. The committee has asked you to write a program that will help them to check whether the ID numbers are correct and then to create the registration code for the participants.

- 3.1 Write a function, **ValidID**, which will receive the ID number and return whether it is valid or not (true or false). In order to check whether the ID number is valid, the Luhn algorithm needs to be applied.

Algorithm:

1. Add all the digits in the odd positions (exclude the last digit)
2. Multiply the digits in the even positions by 2 and combine the answers
3. Add the digits of the result in step 2
4. Add values from step 1 and step 3 together
5. Subtract the second digit of step 4 from 10.
6. If result of step 5 equals the 13th digit in the ID number, then ID is correct.

Example:

9801210054088

1. $9 + 0 + 2 + 0 + 5 + 0 = 16$
2. 16220816
3. $1 + 6 + 2 + 2 + 0 + 8 + 1 + 6 = 26$
4. $16 + 26 = 42$
5. $10 - 2 = 8$
6. $8 = 8 \rightarrow$ ID correct (17)

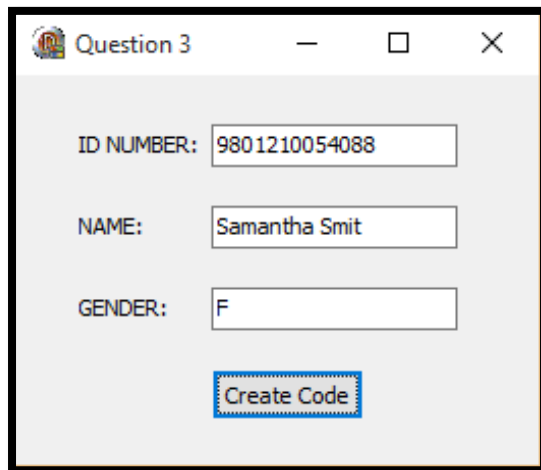
- 3.2 Write a function, **Gender**, which will receive the ID number and return either 'M' or 'F'. If the 7th digit of the ID number is less than or equal to four, then the person is a female. If the 7th digit is greater than 4 then the person is a male. (7)

- 3.3 Write a procedure, **RegCode**, which will receive the name and surname (one variable) as a parameter. A code will be generated using the first four consonants from the name and surname, '#' and a random number between 100 and 999. (17)

- 3.4 Write code for the **Create Code** button which will expect the user to enter their ID number, name and gender. If the ID number is valid and the gender is correct then a registration code can be created. If either the ID number or the gender is not correct, then a message must be displayed informing the user that the information is incorrect.

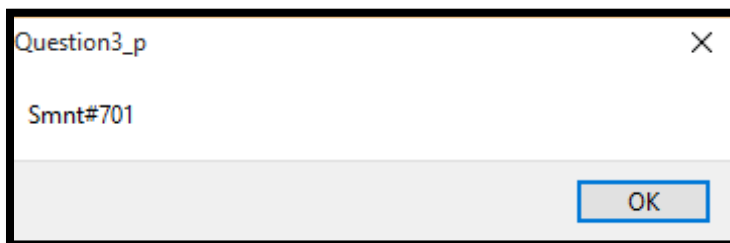
HINT: Make use of the methods written in Question 3.1 – 3.3.

Example of input:



A screenshot of a Windows-style dialog box titled "Question 3". It contains three input fields: "ID NUMBER:" with the value "9801210054088", "NAME:" with the value "Samantha Smit", and "GENDER:" with the value "F". Below the fields is a button labeled "Create Code".

Example of output (output will be different due to the random numbers):



A screenshot of a Windows-style dialog box titled "Question3_p". It displays the output "Smnt#701" and has an "OK" button at the bottom right.

(8)

- Enter your name and surname as a comment in the first line of the program file.
- Save your program.
- A printout of the code may be required.

TOTAL QUESTION 3: [49]

QUESTION 4: DATABASE PROGRAMMING

When organising a school production there are always many jobs that need to be done to make the entire event a huge success. Parents are asked to assist with various tasks, e.g. set constructions, sourcing the props, cast welfare, painting, etc.

Your program should be able to connect to the database named **helpers.mdb**. When you do Question 4.1 and you find that the connectivity is not in place, use the following steps to establish connectivity:

- Click on the Adotable component **adohelpers**.
- Click on the Ellipsis button (three dots) to the right of the 'ConnectionString' property in the Object Inspector.
- Click on the Build button which takes you to the Data Link Properties dialogue box.
- Click on the Provider tab to open the Provider tab sheet and select Microsoft Jet 4.0 OLE DB Provider. Click on the Next button.
- The Connection tab sheet will be displayed. The first option on the Connection tab sheet provides an Ellipsis button (three dots) that allows you to browse and look for the **helpers.mdb** file. Once you have found it, select the **helpers.mdb** file and then click on the Open button.
- Remove the user name Admin.
- Click on the Test Connection button.
- Click OK on each of the open dialogue windows.
- Select the correct table in the TableName property of the **adohelpers** component.
- Click on the DataSource component.
- Ensure that the DataSet property is set to **adohelpers**.

An incomplete program has been created for you to process queries on the data in the given database. Your task is to complete this program.

4.1 Sort Menu Option

Display all the records, sorted according to the Surname field and then according to the Name field (alphabetical order).

Example of output:

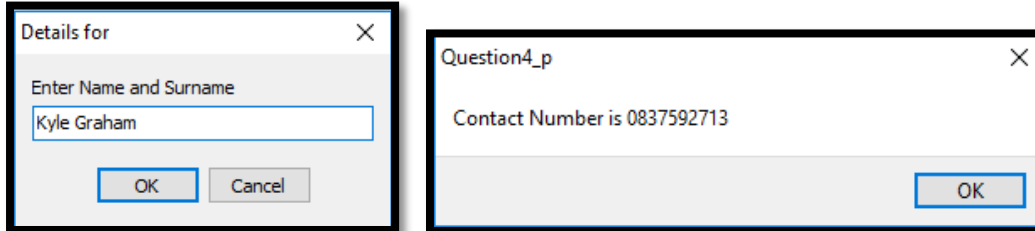
Name	Surname	ContactNumber	Tasks
Clarisse	Arendse	0725436378	Cast Welfare
Natelle	August	0727564786	Cast Welfare
Sarah	Botha	0721232354	Painting
Michael	Carelse	0785723214	Set Construction
Mark	Carr	0836548907	Set Construction
Sandy	du Plessis	0835753673	Cast Welfare
Chantal	du Toit	0743556656	Painting
Bruce	Fisher	0826734852	Set Construction
Simone	Fisher	0831437632	Cast Welfare, Props
Joshua	George	0715346754	Set Construction
Kyle	Graham	0837592713	Set Construction
Asanda	Mgwebi	0826895044	Painting
Amahle	Moyo	0839798571	Costumes, Painting
Alexa	Mullins	0615543672	Painting
Justin	Pape	0846786123	Set Construction
Simon	Peters	0725893762	Set Construction
Lloyd	Pieterse	0735846981	Set Construction
Mary	Sanders	0824687610	Cast Welfare, Props
Rob	Sanders	0837571928	Set Construction, Cast Welfare
Martin	Schutte	0612534721	Set Construction

4.2 Find a Contact Number Menu Option

Write code which will ask the user to enter the name and surname of the parent and then display the contact number in a dialog box.

NO FILTERS MAY BE USED.

Example of output if Kyle Graham is entered:

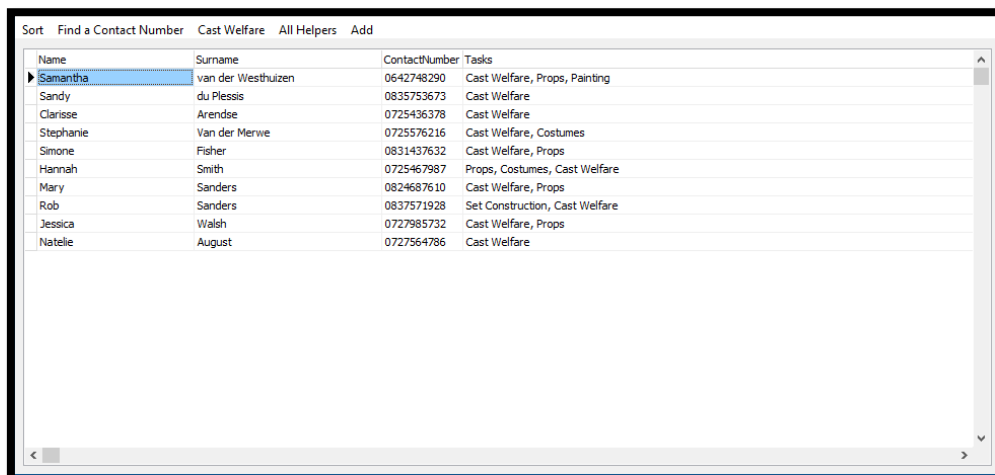


(9)

4.3 Cast Welfare Menu Option:

All the information of the parents who are willing to assist with cast welfare, must be displayed.

Example of output:

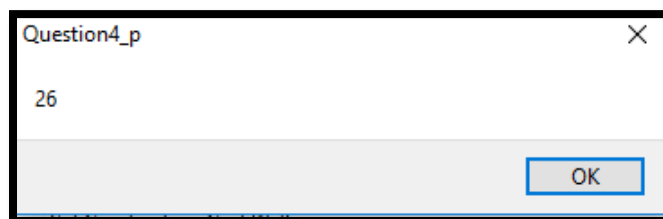


(2)

4.4 All Helpers Menu Option:

Write code to count how many parents have volunteered their services and display the number.

Example of output:



(2)

4.5 Add Menu Option:

Add the following parent to the database:

Name = Paige

Surname = Watson

ContactNumber = 0832454216

Example of output:

Name	Surname	ContactNumber	Tasks
Bruce	Fisher	0826734852	Set Construction
Simone	Fisher	0831437632	Cast Welfare, Props
Joshua	George	0715346754	Set Construction
Kyle	Graham	0837592713	Set Construction
Asanda	Mgwebi	0826895044	Painting
Amahle	Moyo	0839798571	Costumes, Painting
Alexa	Mullins	0615543672	Painting
Justin	Pape	0846786123	Set Construction
Simon	Peters	0725893762	Set Construction
Lloyd	Pieterse	0735846981	Set Construction
Mary	Sanders	0824687610	Cast Welfare, Props
Rob	Sanders	0837571928	Set Construction, Cast Welfare
Martin	Schutte	0612534721	Set Construction
Hannah	Smith	0725467987	Props, Costumes, Cast Welfare
Kevin	Smith	0823564425	Set Construction
Stephanie	Van der Merwe	0725576216	Cast Welfare, Costumes
Samantha	van der Westhuizen	0642748290	Cast Welfare, Props, Painting
Jessica	Walsh	0727985732	Cast Welfare, Props
Paige	Watson	0832454216	Set Construction
Tom	Williams	0831266628	Set Construction

(5)

- Enter your name and surname as a comment in the first line of the program file.
- Save your program.
- A printout of the code may be required.

TOTAL QUESTION 4: [20]

TOTAL: 150