

Unit XVIII Assignment II

By Nathan Windisch

PIII: Implementing a Database

The following screenshots are the tables that I have made within my database. They all have no redundant data within them, and they all have 10 rows of data that follow the data dictionary, which can be seen on the next page.

The following image is the Customers table.

tblCustomer		tblGardener	tblJob
CustomerID	CustomerFirstName	CustomerLastName	CustomerEmail
0	Ryan	Krage	ryankrage@email.
1	Nathan	Windisch	nathanwindisch@
2	Jamie	Waastaff	jamiewaastaff@er
3	Megan	Clarke	meganclarke@er
4	Ruben	Small	rubensmall@email
5	James	Phillips	jamesphillips@emc
6	Charlie	Dodd	charliedodd@emc
7	Sachin	Dougall	sachindougall@er
8	Rebekah	Kinchin	rebekahkinchin@e
9	Conor	Mehring	conormehring@er
10	Thomas	Widdis	thomaswiddis@er
*	0		

The following image is the Employees table.

	tblCustomer	tblGardener	tblJob
	Gardener	GardenerFirstName	GardenerLastName
+	0	Raymond	Gonzales
+	1	Betty	Lewis
+	2	Frances	Perry
+	3	Steven	Sanders
+	4	Brian	Bennett
+	5	Keith	Edwards
+	6	Lori	Parker
+	7	Norma	Flores
+	8	Arthur	Thompson
+	9	Jesse	Murphy

The following image is the Jobs table.

tblCustomer		tblGardener		tblJob		
JobID	AssignedGardener	AssignedCustomer	JobCost	JobName	JobHours	JobDate
0	3	8	25	Resculpt Flower bed	3	23/05/2017
1	7	9	250	Remove Tree from garden	2	22/05/2017
2	2	6	10	Mow Lawn	4	01/06/2017
3	8	1	50	Plant new flowerbeds	1	31/05/2017
4	5	5	15	Remove Weeds	1	27/05/2017
5	4	7	25	Mow lawn and remove weeds	12	28/05/2017
6	1	8	70	Gather flowers from suppliers	1	30/05/2017
7	0	3	100	Plant new trees	3	24/05/2017
8	7	6	50	Add rocks to rockery	0	24/05/2017
9	5	0	130	Replace patio	0	21/05/2017

The following is the aforementioned data dictionary.

Field Name	Data Type	Maximum Field Length	Description
EmployeeID	UUID	16 Characters	Used as a unique identifier for each employee
EmployeeName	String	64 Characters	Used as a human readable format for identifying customers
EmployeeRole	String	16 Character	Used for the permission system
RoleDescription	String	128 Character	A brief description of their role
RoleWageMin	Double	10 Digits	The minimum amount that a person in that role can be paid
RoleWageMax	Double	10 Digits	The maximum amount that a person in that role can be paid
CustomerID	UUID	16 Characters	used as a unique identifier for each customer
CustomerName	String	64 Characters	Used as a human readable format for identifying customers
CustomerBalance	Double	10 Digits	The amount of credits that the customer has
CustomerAddress	String	64 Characters	The address of the customer
CustomerPostcode	String	8 Characters	The postcode of the customer
CustomerPhoneNumber	Integer	15 Characters	Either the mobile or the landline number of the customer
ItemID	UUID	16 Characters	Used as a unique identifier for each item
ItemName	String	64 Characters	Used as a human readable format for identifying items
ItemPrice	Double	10 Digits	The price of the item
ItemDescription	String	128 Characters	A brief description of the product
ItemTags	ArrayList	64 Characters Per Entry	A list of tags that can be applied to the item

PIV: Forms

The following form is a form which allows users to search though the Jobs table. The following image is taken from that search query:

qtSearchJobs

Search Jobs

Search JobID: 0

Search AssignedGardener: 3

Search AssignedCustomer: 8

Search JobCost: 25

Search JobName: Resculpt Flower bed

Search JobHours: 3

Search JobDate: 23/05/2017

Search

This is the output that it will give if the values in the query are set to be "ProductID == 1":

JobID	JobName	JobPrice	AssignedGardener	AssignedCustomer
1	Clearance	250	7	3

Other queries can be made with this form, and this is the output that it will give if the values in the query are set to "AssignedCustomer == 3":

JobID	JobName	JobPrice	AssignedGardener	AssignedCustomer
1	Clearance	250	7	3
2	Maintenance	2000	3	3
3	Tidying	300	5	3
4	Redesign	5000	9	3

The following is a secondary form that is used for adding data to the database. It requires a password so that the user can verify that they have the correct access:

frmMain

Main Menu

Exit DB

Gardener Access

Edit Work Orders

Superuser Access

Password

Edit Work Orders

Print Bills

View/Edit Gardeners

View/Edit Customers

And this is a hypothetical outcome that the form being filled out could create:

GardenerID	GardenerFirstName	GardenerLastName
10	David	Tennant

PV: Querying the Database

I shall now create some reports that show the results of the database being queried. I shall show the total sales of the business, the top five customers and the total amount of customers to gardeners.

The following image is the output of the total sales:

qrTotalJobs	
Total Jobs	Total Income
10	725

The following image is the output of the top five customers:

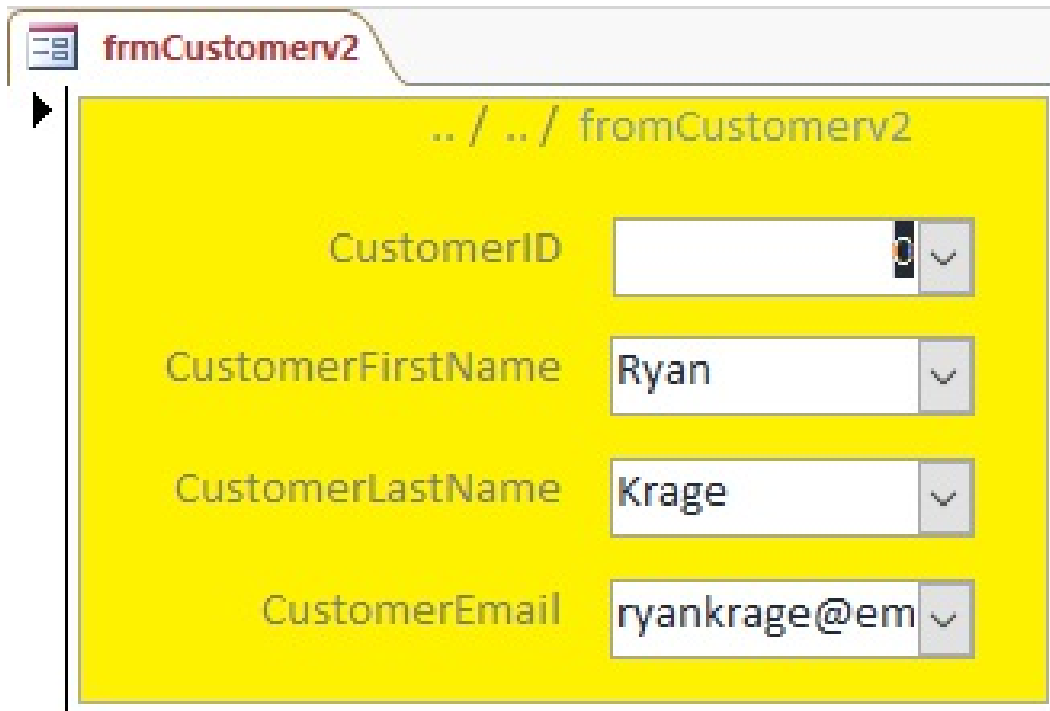
qrTop5	
AssignedCustomer	Services Bought
6	2
5	1
3	1
1	1
0	1

The following image is the output of the amount of customers per gardener:

qrCustomersPerGardener	
AssignedGardener	CountOfAssignedGardener
7	2
5	2
8	1
4	1
3	1
2	1
1	1
0	1

PVI: Form Themes

The following image is a form that has been styled to be more appealing to the user with a bright yellow background, navigation at the top in the form of breadcrumbs so that the user can go to previous sections, and a dropdown box to allow easier data addition, which will auto update the entire form when any of the boxes are changed.



frmCustomerv2

.. / .. / fromCustomerv2

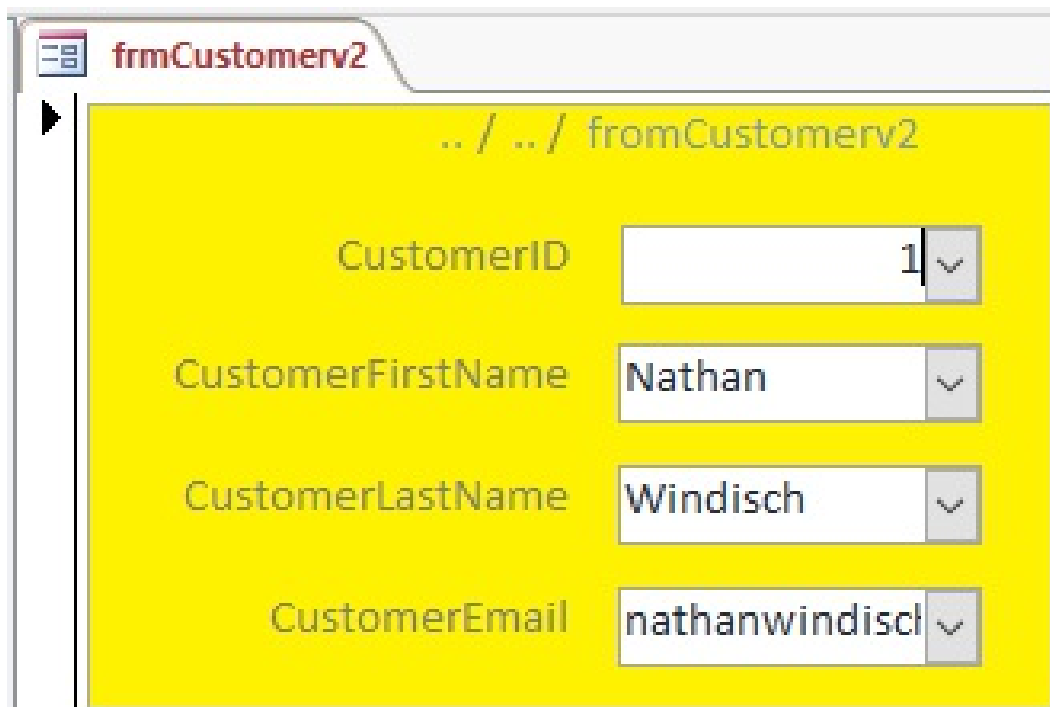
CustomerID

CustomerFirstName

CustomerLastName

CustomerEmail

The following image is the same form but with different data that has been auto-updated.



frmCustomerv2

.. / .. / fromCustomerv2

CustomerID

CustomerFirstName

CustomerLastName

CustomerEmail

PVII: Testing and Logging

Test Log

ID	Date	Summary	Details	Expected Outcome	Passed?	Problem ID
1	18/3/17	Form Gardener First Name Entry Check	Check if input is text and one word only	Only one word with no numbers/symbols can be inputted	Yes	N/A
2	18/3/17	Form Gardener Last Name Entry Check	Check if input is text and one word only	Only one word with no numbers/symbols can be inputted	Yes	N/A
3	18/3/17	Form Customer First Name Entry Check	Check if input is text and one word only	Only one word with no numbers/symbols can be inputted	Yes	N/A
4	18/3/17	Form Customer Last Name Entry Check	Check if input is text and one word only	Only one word with no numbers/symbols can be inputted	Yes	N/A
5	18/3/17	Form Customer First Name Entry Check	Check if input is text and one word only	Only one word with no numbers/symbols can be inputted	Yes	N/A
6	18/3/17	Generate Bill Report	Check if the bill will be generated	A bill will be generated with dynamically changed with the new data	Yes	N/A
7	18/3/17	Generate Top5 Report	Check if the top five list will be generated	A list of the top five customers will be generated with dynamically changed with the new data	Yes	N/A
8	18/3/17	Generate Total Sales Report	Check if the sales list will be generated	A list of all the sales will be generated with dynamically changed with the new data	Yes	N/A
9	18/3/17	Print Bill via Linux	Check if the bill can be printed on Linux	The bill will be sent to the printer	Yes	N/A
9	18/3/17	Print Bill via Windows	Check if the bill can be printed on Windows	The bill will be sent to the printer	No	1
10	18/3/17	Referential Integrity	Check if the database has referential integrity	The database will have referential integrity	Yes	N/A

Fault Log

Problem ID	Test ID	Problem	Solution
1	9	The bill wouldn't print on Linux	Create a new method for printing via Linux, see D2

MII: Importing Data

The following image is the file that I was going to use to import:

CustomerID	CustomerFirstName	CustomerLastName	CustomerEmail
11	Silvester	McCoy	silvestermccoy@email.net
12	Thomas	Baker	thomasbaker@email.net
13	Jon	Pertwee	jonpertwee@email.net
14	Paul	McGann	paulmcgann@email.net
15	Christopher	Eccleston	christophereccleston@email.net

I used a wizard within Access to help me import the data, as follows:

Get External Data - Excel Spreadsheet

Select the source and destination of the data

Specify the source of the definition of the objects.

File name: C:\Users\nathan.windisch\Documents\tblCustomer.xlsx Browse...

Specify how and where you want to store the data in the current database.

☐ Import the source data into a new table in the current database.
If the specified table does not exist, Access will create it. If the specified table already exists, Access might overwrite its contents with the imported data. Changes made to the source data will not be reflected in the database.

☒ Append a copy of the records to the table: tblCustomer
If the specified table exists, Access will add the records to the table. If the table does not exist, Access will create it. Changes made to the source data will not be reflected in the database.

☐ Link to the data source by creating a linked table.
Access will create a table that will maintain a link to the source data in Excel. Changes made to the source data in Excel will be reflected in the linked table. However, the source data cannot be changed from within Access.

OK Cancel

In the above image I set the data to append to the end of the table.

I came across an error which was caused by the fact that I already had the table open, so I had to close it:

Microsoft Access

! The table which you are trying to append to is currently open and must be closed before proceeding. Do you want to save the changes and close the table?

Yes No

In the image below I had to confirm that all of the data was in the right column, which it was:

Import Spreadsheet Wizard

Microsoft Access can use your column headings as field names for your table. Does the first row specified contain column headings?

☒ First Row Contains Column Headings

	CustomerID	CustomerFirstName	CustomerLastName	CustomerEmail
1	11	Silvester	McCoy	silvestermccoy@email.net
2	12	Thomas	Baker	thomasbaker@email.net
3	13	Jon	Pertwee	jonpertwee@email.net
4	14	Paul	McGann	paulmcgann@email.net
5	15	Christopher	Eccleston	christophereccleston@email.net
6				
7				
8				
9				
10				
11				

Cancel


< Back

Next >

Finish

In the next image, I had to confirm what table I wanted to import the data to, and confirm if I wanted the wizard to analyse my data:

Import Spreadsheet Wizard



That's all the information the wizard needs to import your data.

Import to Table:

tblCustomer

☒ I would like a wizard to analyze my table after importing the data.

Cancel


< Back

Next >

Finish

Here, I had to start the analysis:

Import Spreadsheet Wizard



The wizard is now ready to analyze your new table data. Would you like to continue?

Yes

No

This was the first part of the analysis wizard, it started by explaining what one of the issues might be:

Table Analyzer Wizard

Product	Supplier ID	Supplier	Address
Ravioli Angelo	PAST	Pasta Buttini s.r.l.	Via dei Gelsomiri
Gnocchi di nonna	PAST	Pasta Buttini s.r.l.	Via dei Gelsomiri
Carnarvon Tiger	PAVL	Pavlova, Ltd.	74 Rose St.
Outback Lager	PAVL	Pavlova, Ltd.	74 Rose St.
Pavlova	PAVL	Pavlova, Ltd.	74 Rose St.
Vegie-spread	PAVL	Pav, Ltd.	74 Rose St.

Supplier name is misspelled.

Supplier information is repeated.

**The Table Analyzer:
Looking At the Problem**

Your table or spreadsheet may store the same information many times. Duplicating information can cause problems.

First, duplicating information wastes space.

» Show me an example.

Second, duplicating information can lead to mistakes.

» Show me an example.

Cancel

< Back

Next >

Finish

Next, it showed me how it was going to fix the problem:

Table Analyzer Wizard

Original Products and Suppliers table

xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx
xxxxxxxxxx	xxxx	xxxxxxxxxx	xxxxxxxx

New Products table

Product	Lookup To Supplier
Gnocchi di nonna	PAST
Ravioli Angelo	PAST
Carnarvon Tiger	PAVL
Outback Lager	PAVL
Pavlova	
Vegie-spread	

New Suppliers table

Supplier ID	Supplier	Address
PAST	Pasta Buttini s.r.l.	Via dei Gelsomini, 1
PAVL	Pavlova, Ltd.	74 Rose St.

**The Table Analyzer:
Solving the Problem**

The wizard will split the original table to create new tables, where each piece of information is stored only once.

You can now update in just one place the information that is used many times.

» Show me an example.

You can work with information from different tables at the same time.

» Show me an example.

Cancel

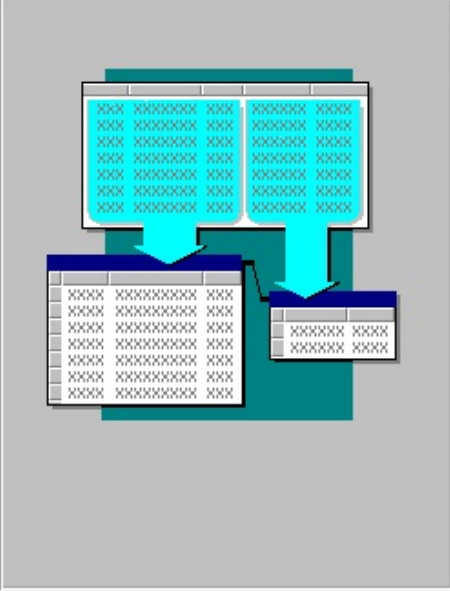
< Back

Next >

Finish

I wanted to decide what I was going to do, so that I could have full control over the data:

Table Analyzer Wizard



Do you want the wizard to decide what fields go in what tables?

If the wizard decides, your next step will be to verify and adjust the wizard's proposal.

☐ Yes, let the wizard decide.

☒ No, I want to decide.

Cancel

< Back

Next >

Finish

I confirmed that all of the data is correct, as seen below:

Table Analyzer Wizard

What fields contain repeated information? You'll want to move these fields to new tables.

Each table should contain data about the same subject.

You can drag and drop fields to make new tables, and to move fields between tables. You can also rename the tables, and set primary key fields.

Table1

CustomerID

CustomerFirstName

CustomerLastName

CustomerEmail

Cancel

< Back

Next >

Finish

I split the table in two, so that the main lookup could be done in the "primary" table, **CID** , and the secondary data which might not be unique was in the "secondary" table, **CData** .

Table Analyzer Wizard

What fields contain repeated information? You'll want to move these fields to new tables.

Each table should contain data about the same subject.

You can drag and drop fields to make new tables, and to move fields between tables. You can also rename the tables, and set primary key fields.

CID

- CustomerID**
Lookup to CData

CData

- Generated Unique ID**
- CustomerFirstName
- CustomerLastName
- CustomerEmail

Buttons: Cancel, < Back, Next >, Finish

I did not want to create a new query:

Table Analyzer Wizard

That's all the information the wizard needs to create related tables.

After the wizard creates new tables, it can create a query that looks like your original table but does much more.

If you choose to create a query:

- Forms and reports based on your original table will continue to work.
- The wizard will give the query the name of your original table, and rename your original table.

Do you want a query?

☐ Yes, create the query.

☒ No, don't create the query.

Buttons: Cancel, < Back, Next >, Finish

The data was successfully imported:

Get External Data - Excel Spreadsheet?×

Save Import Steps

Finished importing file 'C:\Users\nathan.windisch\Documents\tblCustomer.xlsx' to table 'tblCustomer'.

Do you want to save these import steps? This will allow you to quickly repeat the operation without using the wizard.

☐ Save import steps

Close

Albeit, the columns were a tad unordered:

	frmCustomerv2	qtSearchJobs	frmSearch	CID	CData
	CustomerFii	CustomerLa	CustomerEn	ID	Click to Add
+	Charlie	Dodd	charliedodd@	1	
+	Christopher	Eccleston	christopherecc	2	
+	Conor	Mehring	conormehring	3	
+	James	Phillips	jamesphillips@	4	
+	Jamie	Wagstaff	jamiewagstaff	5	
+	Jon	Pertwee	jonpertwee@	6	
+	Megan	Clarke	meganclarke@	7	
+	Nathan	Windisch	nathanwindisc	8	
+	Paul	McGann	paulmcgann@	9	
+	Rebekah	Kinchin	rebekahkinchi	10	
+	Ruben	Small	rubensmall@e	11	
+	Ryan	Krage	ryankrage@en	12	
+	Sachin	Dougall	sachindougall(13	
+	Silvester	McCoy	silvestermccoy	14	
+	Thomas	Baker	thomasbaker@	15	
+	Thomas	Widdis	thomaswiddis	16	
*				(New)	

Fixed, but the IDs were a bit odd...

frmCustomerv2 qtSearchJobs frmSearch CID CData				
	ID	CustomerFirstName	CustomerLastName	CustomerEmail
+	1	Charlie	Dodd	charliedodd@email.net
+	2	Christopher	Eccleston	christophereccleston@email.net
+	3	Conor	Mehring	conormehring@email.net
+	4	James	Phillips	jamesphillips@email.net
+	5	Jamie	Wagstaff	jamiewagstaff@email.net
+	6	Jon	Pertwee	jonpertwee@email.net
+	7	Megan	Clarke	meganclarke@email.net
+	8	Nathan	Windisch	nathanwindisch@email.net
+	9	Paul	McGann	paulmcgann@email.net
+	10	Rebekah	Kinchin	rebekahkinchin@email.net
+	11	Ruben	Small	rubensmall@email.net
+	12	Ryan	Krage	ryankrage@email.net
+	13	Sachin	Dougall	sachindougall@email.net
+	14	Silvester	McCoy	silvestermccoy@email.net
+	15	Thomas	Baker	thomasbaker@email.net
+	16	Thomas	Widdis	thomaswiddis@email.net

Because I was looking at the CData table:

frmCustomerv2 qtSearchJobs frmSearch CID CData				
	ID	CustomerFirstName	CustomerLastName	CustomerEmail
+	1	Charlie	Dodd	charliedodd@email.net
	CustomerID Click to Add			
*				
+	2	Christopher	Eccleston	christophereccleston@email.net
	CustomerID Click to Add			
*				
+	3	Conor	Mehring	conormehring@email.net
+	4	James	Phillips	jamesphillips@email.net
+	5	Jamie	Wagstaff	jamiewagstaff@email.net
+	6	Jon	Pertwee	jonpertwee@email.net
+	7	Megan	Clarke	meganclarke@email.net
+	8	Nathan	Windisch	nathanwindisch@email.net
+	9	Paul	McGann	paulmcgann@email.net
+	10	Rebekah	Kinchin	rebekahkinchin@email.net
+	11	Ruben	Small	rubensmall@email.net
+	12	Ryan	Krage	ryankrage@email.net
+	13	Sachin	Dougall	sachindougall@email.net
+	14	Silvester	McCoy	silvestermccoy@email.net
+	15	Thomas	Baker	thomasbaker@email.net
+	16	Thomas	Widdis	thomaswiddis@email.net
*	(New)			

This meant that the IDs were not the same as the Customer IDs, which were in a separate table. The data is much more compact there:

CustomerID	Lookup to CData
0	Ryan, Krage, ryankrage@email.net
1	Nathan, Windisch, nathanwindisch@email.net
2	Jamie, Wagstaff, jamiewagstaff@email.net
3	Megan, Clarke, meganclarke@email.net
4	Ruben, Small, rubensmall@email.net
5	James, Phillips, jamesphillips@email.net
6	Charlie, Dodd, charliedodd@email.net
7	Sachin, Dougall, sachindougall@email.net
8	Rebekah, Kinchin, rebekahkinchin@email.net
9	Conor, Mehring, conormehring@email.net
10	Thomas, Widdis, thomaswiddis@email.net
11	Silvester, McCoy, silvestermccoy@email.net
12	Thomas, Baker, thomasbaker@email.net
13	Jon, Pertwee, jonpertwee@email.net
14	Paul, McGann, paulmcgann@email.net
15	Christopher, Eccleston, christophereccleston@email.net

MIII: Exporting Data

I used a wizard within Access to help me export the data, as follows:

Export - Excel Spreadsheet

Select the destination for the data you want to export

Specify the destination file name and format.

File name:

C:\Users\nathan.windisch\Documents\tblCustomer.xlsx

Browse...

File format:

Excel Workbook (*.xlsx)

Specify export options.

☒ Export data with formatting and layout.

Select this option to preserve most formatting and layout information when exporting a table, query, form, or report.

☒ Open the destination file after the export operation is complete.

Select this option to view the results of the export operation. This option is available only when you export formatted data.

☐ Export only the selected records.

Select this option to export only the selected records. This option is only available when you export formatted data and have records selected.

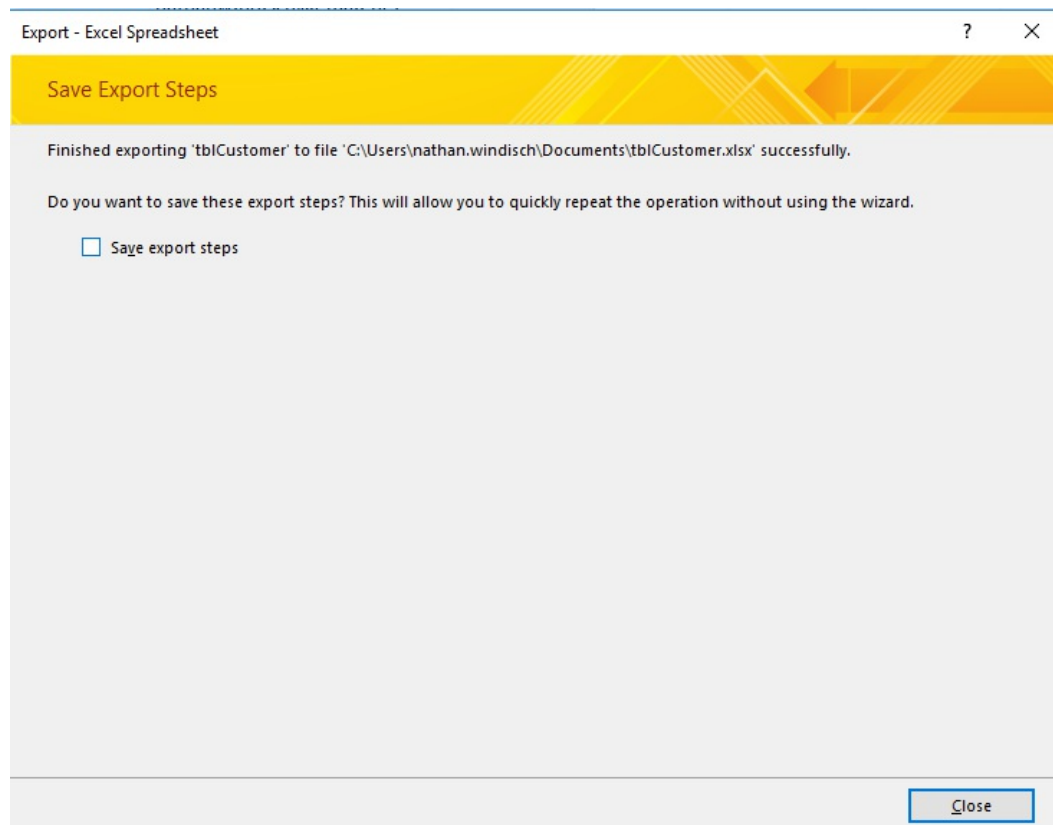
OK

Cancel

The following image is the outcome that was generated, an Excel file with all of the data:

CustomerID	CustomerFirstName	CustomerLastName	CustomerEmail
0	Ryan	Krage	ryankrage@email.net
1	Nathan	Windisch	nathanwindisch@email.net
2	Jamie	Wagstaff	jamiewagstaff@email.net
3	Megan	Clarke	meganclarke@email.net
4	Ruben	Small	rubensmall@email.net
5	James	Phillips	jamesphillips@email.net
6	Charlie	Dodd	charliedodd@email.net
7	Sachin	Dougall	sachindougall@email.net
8	Rebekah	Kinchin	rebekahkinchin@email.net
9	Conor	Mehring	conormehring@email.net
10	Thomas	Widdis	thomaswiddis@email.net

This is the final step to show that everything was successful:



MIV: Advanced Features

The following image is of the main form which has a button on it that will print the bills when pressed:

The screenshot shows a window titled 'frmMain' with standard Windows window controls (minimize, maximize, close). The main content area has a large 'Main Menu' title. To the right of the title is an 'Exit DB' button. Below the title, there are two sections separated by a horizontal line. The top section is labeled 'Gardener Access' and contains an 'Edit Work Orders' button with a dashed border. The bottom section is labeled 'Superuser Access' and contains a 'Password' input field, followed by four stacked buttons: 'Edit Work Orders', 'Print Bills', 'View/Edit Gardeners', and 'View/Edit Customers'.

The following is the code, written in Python

```
import subprocess

def print():
    printfile = open("print.txt", r)

    if platform.system() == "Linux" or platform.system() == "linux":
        lpr = subprocess.Popen("/usr/bin/lpr", stdin=subprocess.PIPE)
        print("starting to print the file")
        lpr.stdin.write(printfile)
        print("file printing finished")
    else:
        print("your operating system is not currently supported")

print()
```

The code will also be executed whenever an order has been completed.

DII: Feedback

When I decided to start to look for feedback, I created a questionnaire with the following questions and format:

Please rate the following questions that are prepended with an  out of 5, where 1 is terrible and 5 is excellent.

*Appearance:

*Legibility:

*Ease of Access:

*Extensive Features:

*Intuitive Design:

*Overall Satisfaction:

Improvement Suggestions:

I gave the questionnaire to one of my customers, Ryan Krage. The following are his answers.

Please rate the following questions that are prepended with an  out of 5, where 1 is terrible and 5 is excellent.

*Appearance: 4

*Legibility: 5

*Ease of Access: 5

*Extensive Features: 1

*Intuitive Design: 5

*Overall Satisfaction: 4

Improvement Suggestions: The code to print the bill didn't work.

I took the criticisms given to me on-board and rewrote the code to work with the client's Windows setup, as the previous iteration of the code only worked with Linux. I added an option feature at the start of the program for the user to select what operating system they were running.

```
import platform
import subprocess

def print():
    printfile = open("print.txt", r)

    if platform.system() == "Windows" or platform.system() == "windows":
        print("starting to print the file")
        win32api.ShellExecute(
            0,
            "print",
            printfile,
            '/d:"%s"' % win32print.GetDefaultPrinter (),
            ".",
            0
        )
        print("file printing finished")
    elif platform.system() == "Linux" or platform.system() == "linux":
        lpr = subprocess.Popen("/usr/bin/lpr", stdin=subprocess.PIPE)
        lpr.stdin.write(printfile)
    else:
        print("your operating system is not currently supported")

print()
```