Database Design & Development

1a Greenhands wishes to create a database to store its staff and job details. Complete the job details in the analysis of inputs table below:

(3 marks)

Staff details:	Job details:
Staff ID Staff Forename Staff Surname Address Top Skill Customer Rating	Customer name Customer Address Customer Postcode Customer Contact telephone Task required Staff ID Date time Job ID Office use only

1b Complete the data dictionary for the Staff entity.

(5 marks)

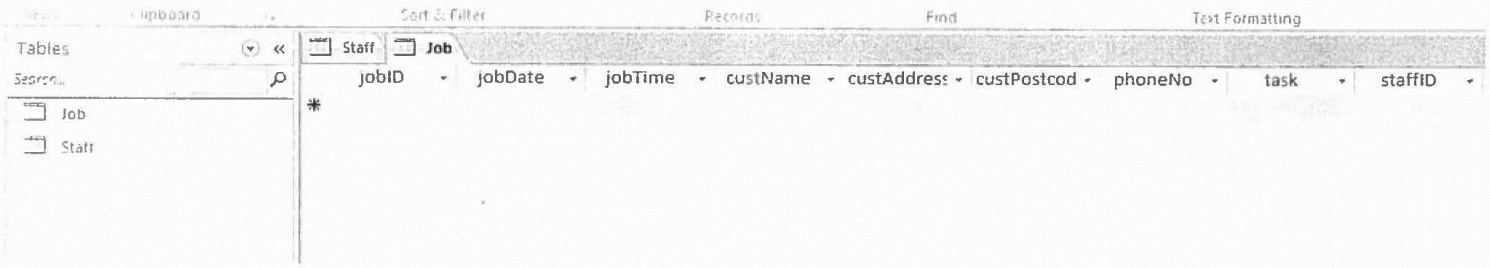
Entity name: Staff					
Attribute name	**Key**	**Type**	**Size**	**Required**	**Validation**
staffID	Primary	text	5	Y	length = 5
forename		text	20	Y	
surname		text	20	Y	
address		text	50	Y	
topSkill		text	5	Y	restricted choice: lawn, hedge or weeds
custRating		number		N	range check: 1 to 10

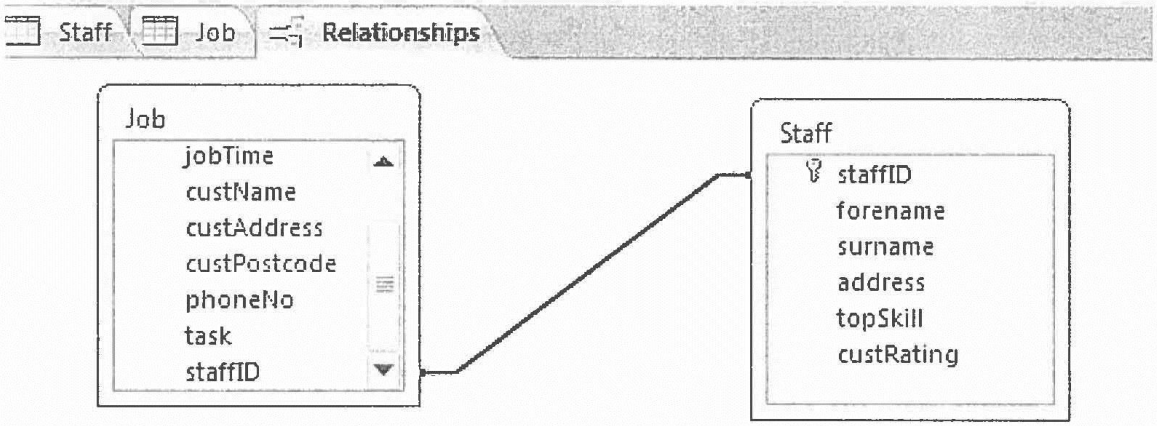
- Check your answers to part A carefully, as it cannot be returned after you hand it in.
- When you are ready, hand it in to your teacher or lecturer and collect part B.

task	Text
staffID	Text

General | Lookup

Field Size	255
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	="Lawn Mowed" Or "Hedge Cut" Or "Weeds Pulled"
Validation Text	
Required	Yes


Tables
Search...
Job
Staff
Staff
Job
jobID
jobDate
jobTime
custName
custAddress
custPostcod
phoneNo
task
staffID


Staff
Job
Relationships
Job
jobTime
custName
custAddress
custPostcode
phoneNo
task
staffID
Staff
staffID
forename
surname
address
topSkill
custRating

Field Name	Data Type
staffID	Text
forename	Text
surname	Text
address	Text
topSkill	Text
custRating	Number

General | Lookup

Field Size	5
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	=5
Validation Text	must be 5 characters long
Required	Yes

topSkill	Text
custRating	Number

General | Lookup

Field Size	Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	
Default Value	
Validation Rule	>=1 And <=10
Validation Text	
Required	Yes

Field Name	Data Type
JobID	AutoNumber
JobDate	Date/Time
JobTime	Date/Time
custName	Text
custAddress	Text
custPostcode	Text
phoneNo	Text
task	Text
StaffID	Text

JobTime	Date/Time
custName	Text
custAddress	Text
custPostcode	Text
phoneNo	Text
task	Text
StaffID	Text
	Text

sk	Text
affID	Text
	Text

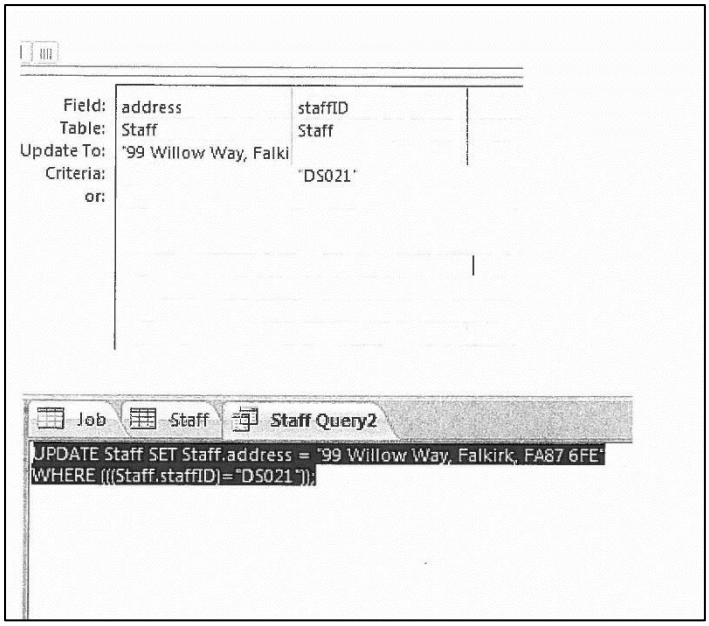
General Lookup

Format	
Input Mask	
Caption	
Default Value	
Validation Rule	>==09:00:00= And <==13:00:00=
Validation Text	Time must be later than 9am and earlier than 6pm

Field

eral Lookup

l Size	12
nat	
it Mask	
ion	
ult Value	
dation Rule	='Lawn Mowed' Or 'Hedge Cut' Or 'Weeds Pulled'
dation Text	
uired	Yes
w Zero Length	Yes
xed	No
ode Compression	Yes
Mode	No Control
Sentence Mode	None
t Tags	


Field: address staffID
Table: Staff Staff
Update To: "99 Willow Way, Falki
Criteria: "DS021"
or:
Job
Staff
Staff Query2
UPDATE Staff SET Staff.address = "99 Willow Way, Falkirk, FA87 6FE"
WHERE (((Staff.staffID)="DS021"));

Staff

staffID	forename	surname	address	topSkill	custRating	Click to Add
DS001	Alison	Duncan	44 Main Street, Falkirk, FK47 5RT	lawn	10	
DS003	Jessica	Lawrie	18 Stevenson view, Denny, FK76 6TU	hedge	9	
DS004	Peter	Falconer	21/4 Kier Place, Alva, ST12 7TR	lawn	8	
DS007	Ryan	MacGowan	122 Moray Place, Falkirk, FK93 5RD	hedge	7	
DS010	Martyn	Crawford	5/2 McLeod Street, Denny, FK77 3KT	hedge	6	
DS014	Brenda	Learmonth	42 High Street, Alloa, FK 82 6GF	hedge	6	
DS016	Keegan	Cuthbert	9 Thames Rise, Falkirk, FK99 2SD	lawn	5	
DS019	Ruksana	Ali	62 Riverside drive, Alva, FK71 2FS	lawn	4	
DS021	Derek	Strimmer	99 Willow Way, Falkirk, FA87 6FE	weeds	6	
DS026	Artur	Luts	18 Moat Street, Denny, FK92 6GH	hedge	4	
DS027	Signy	Saar	2 Glasgow Road, Falkirk, FK70 8HR	lawn	3	
DS028	Claudia	Silva	102 Bannockburn drive, Alva, FK91 4RE	weeds	2	
DS055	Brigitta	Corduneanu	92 Evergreen drive, Alva, FK 90 7FG	lawn	2	
DS061	Susan	Brown	62 Riverside drive, Alva, FK71 2FS	hedge	1	
DS063	Chris	Kelly	2 Glasgow Road, Falkirk, FK70 8HR	weeds	1	
DS066	Imad	Khan	42 High Street, Alloa, FK 82 6GF	lawn	1	

Software design and Development

Task 2: software design and development

2a Using the program analysis and design, implement the program in a language of your choice. Ensure the program matches the structure diagram provided.

(15 marks)

Print evidence of your program code.

2b Your program should be tested to ensure it produces different signal patterns correctly.

Complete the table below to create one set of test data that will produce the expected output for the signal pattern shown.

(2 marks)

Type of test	User Input		Expected output for signal pattern	Actual output
Normal	reading 1	69.27	Signal pattern is: MPSPS	Attach printouts of inputs and outputs as evidence.
	reading 2	27.84		
	reading 3	88.12		
	reading 4	21.94		
	reading 5	95.62		

You must demonstrate that your program correctly outputs the signal pattern and the rounded readings.

Print evidence of inputs and outputs to show that you have completed the test.

2c Your program should be tested to ensure that each signal strength character is correctly assigned as S, M or P. Six extreme test values are required to test this fully.

State the six test data values required:

(3 marks)

Extreme 1 0.00
Extreme 2 30.00
Extreme 3 31.00
Extreme 4 80.00
Extreme 5 81.00
Extreme 6 100.00

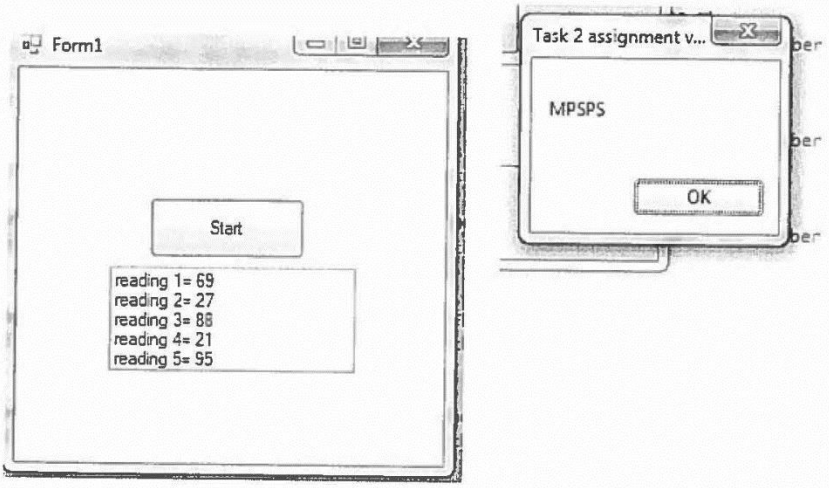
2d With reference to your code, evaluate your program by commenting on the following:

Fitness for purpose (1 mark) My programme is fit for purpose because it is able to successfully ~~take~~ display all five readings as well as the Signal Strength which will be shown in order of the readings. As can be seen in print out
Where your code demonstrates efficient use of programming constructs (1 mark) My programme is efficient because it uses an array instead of creating several different variables. See screenshot
Robustness of your completed program (1 mark) My programme is robust because I used validation to ensure that any incorrect data would not crash the programme
Readability of your code (2 marks) My programme was readable because I used white space and selected variable names that were relevant to what they were used for. This can be seen in the print out

Computing\visual ... 2 assignment vb 2\Task 2 assignment vb 2\Form1.vb 1

```
Public Class Form1

    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
        Dim signal(5) As String
        Dim strength(5) As String

        For counter = 1 To 5 'this means that it will lop this piece of code 5 times'
            signal(counter) = InputBox("Please Enter Signal Strength between 0 and 100") 'this will send a ↙
    display to the monitor asking the user to enter the strength'

            If signal(counter) >= 80 And signal(counter) <= 100 Then
                strength(counter) = "S" 'this will make sure that any number entered that is between 80 and ↙
    100 will be displayed as "S"'
            End If

            If signal(counter) < 80 And signal(counter) > 30 Then
                strength(counter) = "M" 'this will make sure that any number entered that is between 80 and ↙
    30 will be displayed as "M"'
            End If

            If signal(counter) < 30 And signal(counter) > 0 Then
                strength(counter) = "P" 'this will make sure that any number entered that is between 30 and ↙
    0 will be displayed as "P"'
            End If


        Next
        MsgBox(strength(1) + strength(2) + strength(3) + strength(4) + strength(5))
        ListBox1.Items.Add("reading 1= " & signal(1))
        ListBox1.Items.Add("reading 2= " & signal(2))
        ListBox1.Items.Add("reading 3= " & signal(3))
        ListBox1.Items.Add("reading 4= " & signal(4))
        ListBox1.Items.Add("reading 5= " & signal(5)) 'this will send the signals of all the readings to a ↙
    listbox that can be seen by the user'




    End Sub
End Class
```

2b)


Form1
Start
reading 1= 69
reading 2= 27
reading 3= 88
reading 4= 21
reading 5= 95
Task 2 assignment v...
MPSPS
OK

2d With reference to your code, evaluate your program by commenting on the following:

Fitness for purpose (1 mark)

My programme is fit for purpose because it is able to successfully take and display the five readings at the event along with the signal pattern, which shows the strength of the readings.

```
For counter = 1 To 5 'this means that it will lop this piece of code 5 times
    signal(counter) = InputBox("Please Enter Signal Strength between 0 and 1

    If signal(counter) >= 80 And signal(counter) <= 100 Then
        strength(counter) = "S" 'this will make sure that any number enterec
    End If

    If signal(counter) < 80 And signal(counter) > 30 Then
        strength(counter) = "M" 'this will make sure that any number enterec
    End If

    If signal(counter) < 30 And signal(counter) > 0 Then
        strength(counter) = "P" 'this will make sure that any number enterec
    End If


Next
MsgBox(strength(1) + strength(2) + strength(3) + strength(4) + strength(5))
ListBox1.Items.Add("reading 1= " & signal(1))
ListBox1.Items.Add("reading 2= " & signal(2))
ListBox1.Items.Add("reading 3= " & signal(3))
ListBox1.Items.Add("reading 4= " & signal(4))
ListBox1.Items.Add("reading 5= " & signal(5)) 'this will send the signals of
```

Where your code demonstrates efficient use of programming constructs (1 mark)

My programme is efficient because it uses an array instead of creating several different variables

```
For counter = 1 To 5
    signal(counter)
```

Robustness of your completed program (1 mark)

My programme is robust because it asks the user to input a number ranging from 0 to 100 so that they will not put in an unusable number

```
InputBox("Please Enter Signal Strength between 0 and 100"
```

Readability of your code **(2 marks)**

My code was readable because I used white space and I included comments into my programme to explain what I am doing and what it means.

```
    strength(counter) = "S" 'this will make sure that any number
End If

If signal(counter) < 80 And signal(counter) > 30 Then
    strength(counter) = "M" 'this will make sure that any number
End If
```

Web Design and Development

Task 3: web design and development

Grieve Crafts builds eco-friendly garden products. They wish to create a web page with the following content:

- a coloured top section which includes the company name
- a coloured middle section which includes a heading and short paragraph titled "About our Company"
- a coloured bottom section which include a heading, three photographs showing their most popular product being built and descriptions to accompany the photographs
- an external link to a web page about their wood source.

3a State two functional requirements for the web page.

Functional requirement 1 **(1 mark)**
Be able to access a wikipedia page via hyperlink on the site.

Functional requirement 2 **(1 mark)**
External interface due to some interface code being in an external CSS file

---HTML CODE---

```
<html>

<head>
<title> Greive Crafts - HomePage </title>
<link rel="stylesheet" type="text/css" href="style.css"/>
<style>
        #ABC {
           background-color: #b53232;
                                font-size: 24pt
        }
                        #ACC {
                            background-color: #ff00ee;
                                font-size: 18pt
                        }
#ADF {
            background-color: #ff00ee;
                                font-size: 12pt
}
      </style>
</head>

<body>

<section>
<section id="ABC">
<font color="white"><h1 align="right">GreiveCrafts</h1></font>
</section>

<section>
<section id="ACC">
<font color="black"><h1 align="left"> About Our Company </h1>
<p>Formed in 2016, Grieve Crafts is an environmentally - friendly company whose products are all made from
recycled wood.</p></font>
</section>

<section>
<section id="ADF">
<font color="black"><h1 align="left"> Our Best Seller</h1>
<P> Built from recycled <u> wooden pallets </u> our exclusive wood shed is available at a discounted price of
£235. </p>
<img src="firstStage.jpg" width="200" height="200">
<p> Starting Point: Dismantle four or five old pallets. </p>
<img src="middleStage.jpg" width="200" height="200">
<p> Halfway Point: The basic structure is assembled </p>
<img src="finishedStage.jpg" width="200" height="200">
<p> Finishing Point: The finished, painted product. </p>
</section>
<a href="https://en.wikipedia.org/wiki/Pallet">Wikapedia page on pallets</a>
</body>

</html>
```

---CSS CODE---

```
body {background-color: #b2fdff;}

p {
   font-family: "Helvetica";
}

h1 {
   font-family: "Helvetica";
}
```

Website Screenshot

GreiveCrafts

About Our Company

Formed in 2016, Greive Crafts is an environmentally-friendly company whose products are all made from recycled wood.

Selling Point: The finished painted product.

Home page on pallet