Question 2

Response 1

2. A string variable called `month` has been assigned the value 'April' and another string variable called `year` has been assigned the value '2019' as shown below.

```
Line 1    DECLARE month INITIALLY "April"
Line 2    DECLARE year INITIALLY "2019"
Line 3    _____
```

The variable `shortDate` is to be assigned the value 'Apr19' using substring operations.

Using a programming language of your choice write line 3. 2

```
Dim shortdate As String = mid(month,1,3) + mid(year,3,1)
                          + mid(year,3,1)
```

Response 2

2. A string variable called `month` has been assigned the value 'April' and another string variable called `year` has been assigned the value '2019' as shown below.

```
Line 1    DECLARE month INITIALLY "April"
Line 2    DECLARE year INITIALLY "2019"
Line 3    _____
```

The variable `shortDate` is to be assigned the value 'Apr19' using substring operations.

Using a programming language of your choice write line 3. 2

```
shortDate = month[0:3] + year[2:4]
```

Question 3

Response 1

3. An instruction to be executed is in memory address 3412.
Complete the missing steps of the fetch-execute cycle shown below. 2

Step 1 The processor sets up the address bus with the address 3412.

Step 2 The processor activates the read line on the control bus

Step 3 Instruction is send to memory location using the data bus and then saved in the instruction register

Step 4 The instruction in the instruction register is then interpreted by the decoder and carried out.

Response 2

3. An instruction to be executed is in memory address 3412.
Complete the missing steps of the fetch-execute cycle shown below. 2

Step 1 The processor sets up the address bus with the address 3412.

Step 2 Read line is activated thereby transferring instructions to Memory Data register

Step 3 Instructions get passed to Instruction register from Memory Data register

Step 4 The instruction in the instruction register is then interpreted by the decoder and carried out.

Question 11(b)(i)

Response 1

(b) (i) Using a programming language of your choice, define a suitable record data structure for the data above. 2

```
Structure SampleData
  Dim Speed As Real
  Dim accelerator As Integer
  Dim brake As Integer
  Dim seatbelt As Boolean
End Structure
```

Response 2

(b) (i) Using a programming language of your choice, define a suitable record data structure for the data above. 2

SQA REFERENCE LANG.

```
RECORD event IS {
    REAL speed;
    INTEGER accelerator;
    INTEGER brake;
    BOOLEAN seatbeltOn;
}
```

Question 11(b)(ii)

Response 1

11. (b) (continued)

(ii) Using a programming language of your choice, define the variable which can store the details of the 200 readings. Your answer should use the record data structure created in part (i). 2

```
Dim Cars(200) As SampleData
```

Response 2

11. (b) (continued)

(ii) Using a programming language of your choice, define the variable which can store the details of the 200 readings. Your answer should use the record data structure created in part (i). 2

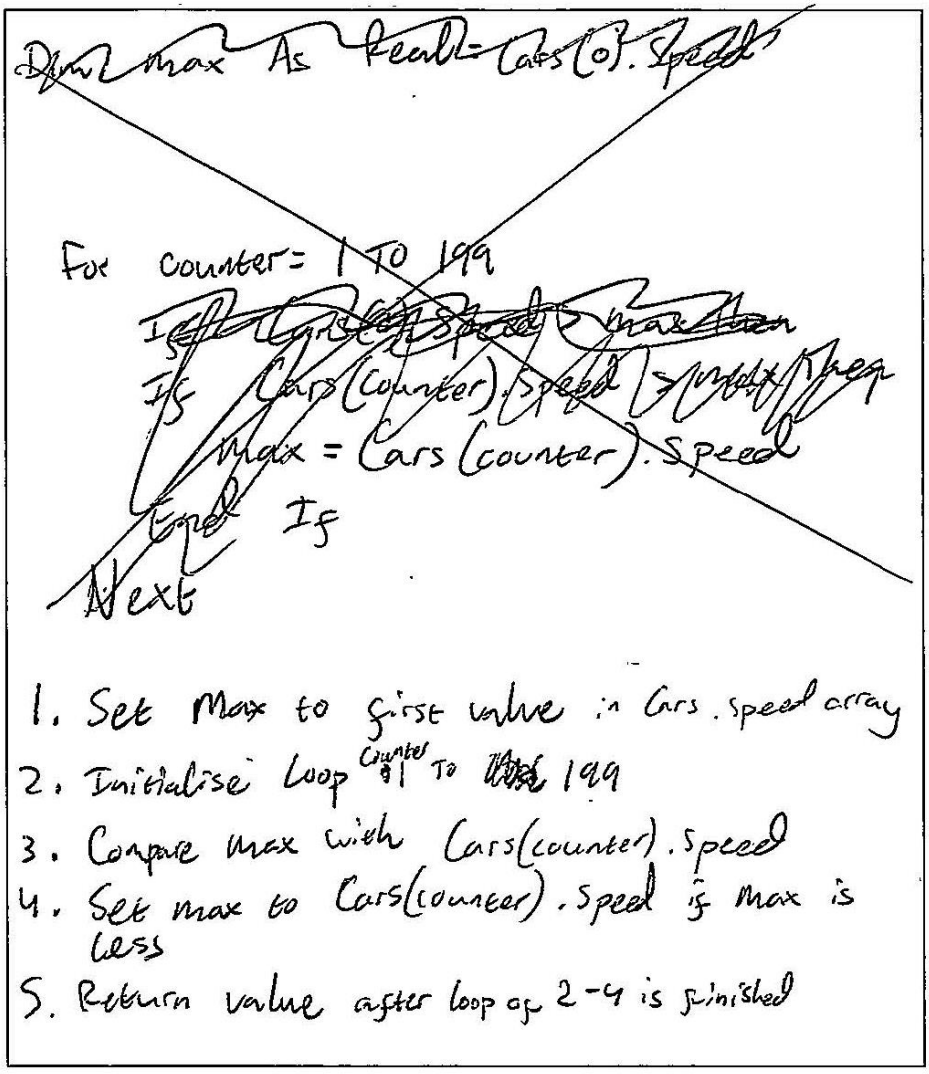
SQA REFERENCE LANG.

```
DECLARE readings AS ARRAY OF event
    INITIALLY [ ]
```

Question 11(c)

Response 1

(c) Using a recognised design technique, design an algorithm to find the maximum speed. 4



Response 2

(c) Using a recognised design technique, design an algorithm to find the maximum speed. 4

```
maxSpeed = -1
for index in range (200):
    if readings[index].speed > maxSpeed:
        maxSpeed = readings[index].speed
```

Question 13(a)

Response 1

13. A charity called Animal Help has a website that allows people to raise funds through sponsorship.

Details entered are stored in a relational database.

Fundraisers can see their total donations from all of their sponsors and Animal Help can view the funds being raised on their behalf.

(a) State two functional requirements of the relational database. 2

Fundraisers must be able to see their total donations

Animal help must be able to see the funds for each fundraiser

Response 2

13. A charity called Animal Help has a website that allows people to raise funds through sponsorship.

Details entered are stored in a relational database.

Fundraisers can see their total donations from all of their sponsors and Animal Help can view the funds being raised on their behalf.

(a) State two functional requirements of the relational database. 2

Calculate a query to show the sum of all the donations of a certain fundraiser (by Sponsor)

Show a query of all funds raised for a certain charity (Animal Help)

Response 3

13. A charity called Animal Help has a website that allows people to raise funds through sponsorship.

Details entered are stored in a relational database.

Fundraisers can see their total donations from all of their sponsors and Animal Help can view the funds being raised on their behalf.

(a) State two functional requirements of the relational database. 2

Must be able to sum all ~~the values for~~ donations from a specific person

Must be able to sum all donations values in the database.

Question 13(c)

Response 1

(c) Animal Help produces a report of the average donation made to each fundraiser.

Write the SQL statement to produce the output shown below. 3

fundraiserID	Average donation (£)
1	13.75
2	17.50
3	12.50

```
Select fundraiserID, Avg(amount) As
[Average donation (£)]
Where fundraiser.fundraiserID
= donation.fundraiserID
```

Response 2

(c) Animal Help produces a report of the average donation made to each fundraiser.

Write the SQL statement to produce the output shown below. 3

fundraiserID	Average donation (£)
1	13.75
2	17.50
3	12.50

```
SELECT fundraiserID, (SUM(amount) / COUNT(fundraiserID))
AS [Average donation (£)]
FROM Donation, fundraiser
WHERE Donation.fundraiserID = fundraiser.fundraiserID
```

Response 3

(c) Animal Help produces a report of the average donation made to each fundraiser.

Write the SQL statement to produce the output shown below. 3

fundraiserID	Average donation (£)
1	13.75
2	17.50
3	12.50

```
SELECT FundraiserID, SUM(amount) / COUNT(amount)
AS [Average donation(£)]
FROM Fundraiser, Donation
WHERE Fundraiser.fundraiserID =
Donation.fundraiserID
GROUP BY FundraiserID
ORDER BY FundraiserID ASC
```

Question 14(a)

Response 1

(a) The table below has the data flow completed for steps 1 and 3 of the algorithm.

Complete the missing data flow for step 2. 2

Step	IN/OUT	Data flow
1	IN	
	OUT	hotelname[], stars[],price[], reviews[]
2	IN	hotelname[], stars[], price[]
	OUT	position []
3	IN	position, hotelname[], stars[],price[], reviews[]
	OUT	

Response 2

(a) The table below has the data flow completed for steps 1 and 3 of the algorithm.

Complete the missing data flow for step 2. 2

Step	IN/OUT	Data flow
1	IN	
	OUT	hotelname[], stars[],price[], reviews[]
2	IN	hotelname(), stars(), price()
	OUT	position
3	IN	position, hotelname[], stars[],price[], reviews[]
	OUT	

Question 14(b)

Response 1

(b) Step 2 finds the position of the cheapest hotel with five stars.

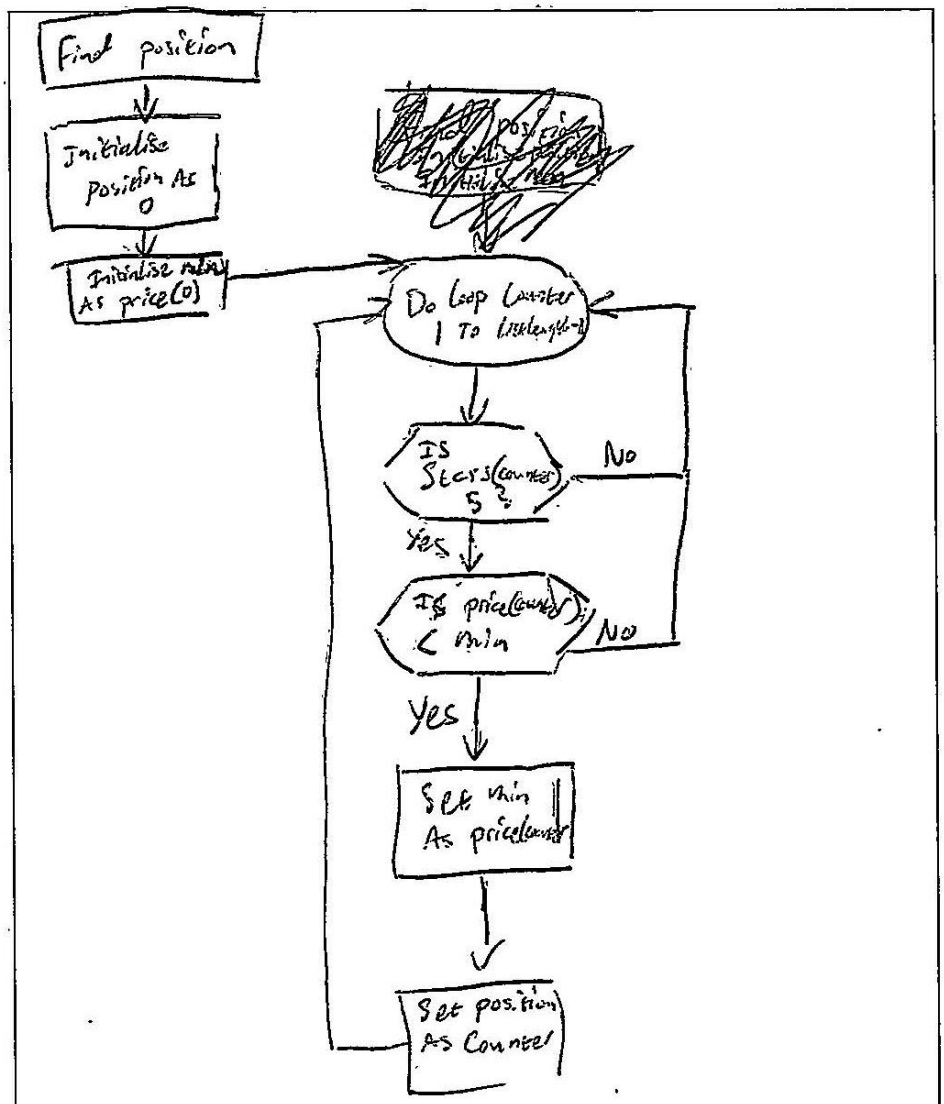
Using a recognised design technique, design this step. **5**

~~open text file~~
~~Position = 0~~
~~loop for the~~
~~lowest price = 5000000~~
~~loop from~~
~~loop for the length of price[]~~
~~#~~
= larger than any same value/variable

```
Position = 0
Price = 5000000
loop for the length of stars[]
 if stars[index] equals to 5 then
     if price[index] < price
       set price to price[index]
       set position to index
     end if
 end if
return position
```

Response 2

(b) Step 2 finds the position of the cheapest hotel with five stars.
Using a recognised design technique, design this step. 5



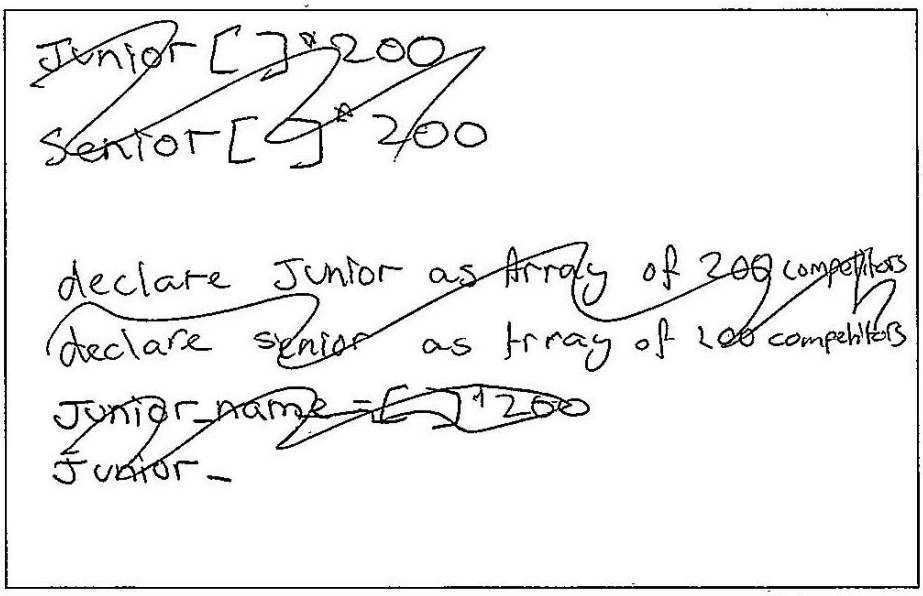
1) Initialise position and minimum
2) Initialise Loop
3) Compare if the amount of Stars(counter) is 5 Else, next
4) Compare if price(counter) is less than minimum Else, next
5) Update min to new price(counter) AND position to Counter

Question 15(a)

Response 1

(a) The data will be stored in parallel 1D arrays.

Using a programming language of your choice, declare parallel 1D arrays that can store the data for the 200 competitors. 2



Declare ~~names~~ names AS ~~Array~~ Array*200 Initially

Declare rank AS Array*200 Initially

Declare scores Array*200 Initially

Response 2

(a) The data will be stored in parallel 1D arrays.

Using a programming language of your choice, declare parallel 1D arrays that can store the data for the 200 competitors. 2

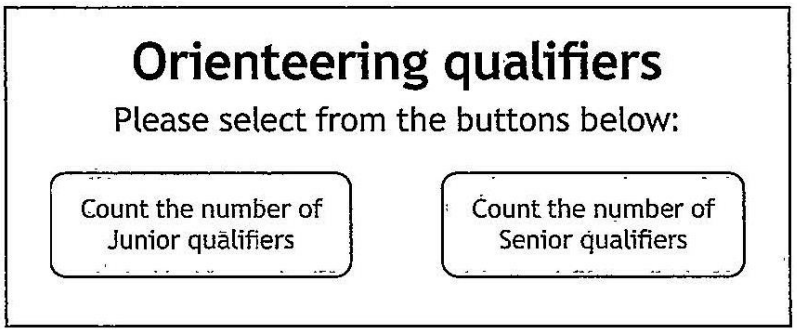
PYTHON CODE

```
name = [""] * 200
category = [""] * 200
score = [0] * 200
```

Question 15(b)

Response 1

(b) Different options are selected by clicking on a button as shown below.



When the 'Count the number of Junior qualifiers' option is selected, the user is asked to enter the qualifying score. The program will then count how many Juniors achieved at least that score. An example output is shown below.

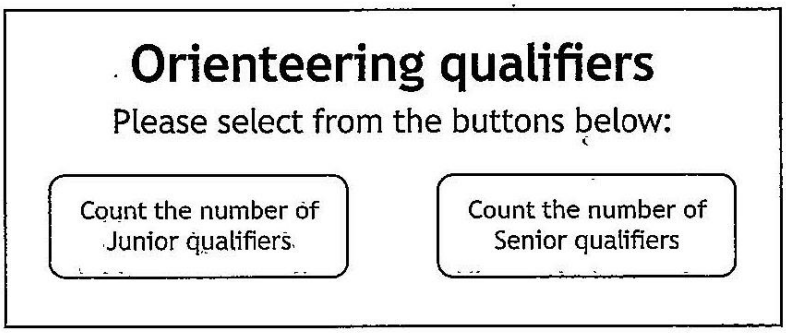
```
'12 Juniors achieved the qualifying score of 42'
```

Using a programming language of your choice, write the code to ask for a qualifying score and then output the appropriate message. 5

```
~~Please enter the qualifying score:~~
# Target = input("please enter the qualifying
score: ")
NumFound = 0
For score in scores:
    If category[score]==Junior AND .
    Scores[score] ≥ target:
        NumFound = NumFound +1
Print(str(NumFound) + " Juniors achieved
the qualifying score of ~~42~~" + str(Target))
```

Response 2

(b) Different options are selected by clicking on a button as shown below.



When the 'Count the number of Junior qualifiers' option is selected, the user is asked to enter the qualifying score. The program will then count how many Juniors achieved at least that score. An example output is shown below.

```
'12 Juniors achieved the qualifying score of 42'
```

Using a programming language of your choice, write the code to ask for a qualifying score and then output the appropriate message. 5

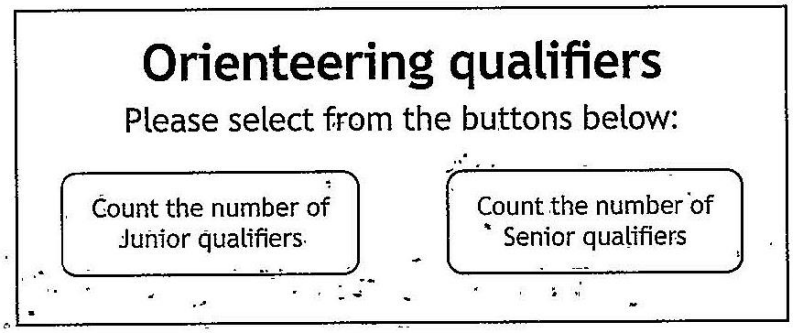
```
Dim qualifiers, Score, Index as Integer
Score = InputBox("What is the score to
                  qualify?")

FOR Index 0. TO 100 Do.
    IF performance(Index) >= Score Then
        qualifiers = qualifiers + 1
    END IF
END FOR

msgbox(qualifiers & " Juniors achieved the
       qualifying score of "&. Score)
```

Response 3

(b) Different options are selected by clicking on a button as shown below.



When the 'Count the number of Junior qualifiers' option is selected, the user is asked to enter the qualifying score. The program will then count how many Juniors achieved at least that score. An example output is shown below.

```
'12 Juniors achieved the qualifying score of 42'
```

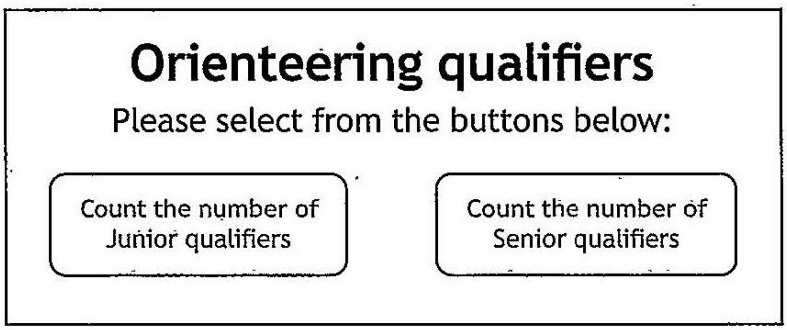
Using a programming language of your choice, write the code to ask for a qualifying score and then output the appropriate message. **5**

PYTHON CODE

```
min = int(input("Please enter qualifying score: "))
count =0
for i in range(200):
    if score[i]>=min:
        count+=1
print(str(count)+" Juniors achieved the qualifying
        score of" + str(min))
```

Response 4

(b) Different options are selected by clicking on a button as shown below.



When the 'Count the number of Junior qualifiers' option is selected, the user is asked to enter the qualifying score. The program will then count how many Juniors achieved at least that score. An example output is shown below.

```
'12 Juniors achieved the qualifying score of 42'
```

Using a programming language of your choice, write the code to ask for a qualifying score and then output the appropriate message. **5**

```
~~InputBox("Qualifying Score = InputBox("Enter the qualifying score")~~
Dim qualifyingScore As Integer
qualifyingScore = InputBox("Please enter the qualifying score")
Dim count As Integer = 0
FOR i = 0 To 199
    If category(i) = "Junior" AND scores(i) >= qualifyingScore Then
        count = count + 1
    End If
Next i
MsgBox(" i & " Juniors achieved the qualifying score of "
& qualifyingScore)
```

See end.

Question 16(d)(i)

Response 1

(i) Write the new function to display the original image when the mouse is moved away from the image. 2

```
function rollaway(my_image){my_image.src='../images/
                                    Bailey2.png';}
```

Response 2

(ii) Re-write the appropriate HTML element to call the function created in part (i) when the mouse is moved away from the image. 2

```
onmouseoff="rolloff(this)">
<img id="dogIImage" src="../images/BailyI.png"
onmouseover="rollover(this)"
onmouseoff="rolloff(this)" >
```

Question 16(d)(ii)

Response 1

(ii) Re-write the appropriate HTML element to call the function created in part (i) when the mouse is moved away from the image. 2

onmouseout = "rollaway(this)"

Response 2

(ii) Re-write the appropriate HTML element to call the function created in part (i) when the mouse is moved away from the image. 2

~~onmouseoff = "rolloff(this)"~~ >
<img id="dogIImage" src="../Images/Bailey1.png"
onmouseover = "rollover(this)"
onmouseoff = "rolloff(this)" >

Question 17(a)

Response 1

(a) Design a query to display the customer's forename, surname and the total amount of hours of lessons booked by each customer during May 2019.

The design has been partially completed for you. 3

Field(s) and calculation(s)	forename, surname, SUM(time)
Table(s)	Customer,Booking
Search criteria	Instructor.instructorID = Booking.instructorID AND date = ??/05/2019
Grouping	forename, surname
Sort order	

Response 2

17. (continued)

(a) Design a query to display the customer's forename, surname and the total amount of hours of lessons booked by each customer during May 2019.

The design has been partially completed for you. 3

Field(s) and calculation(s)	forename, surname, Total(time) as Maxhours
Table(s)	Customer,Booking
Search criteria	Where Customer.customerid = booking.customerID AND date = "*/05/2019"
Grouping	Customer ID
Sort order	

Question 17(d)

Response 1

(d) Design a query to display the forename, surname and the number of lessons booked for each instructor.

The instructor who has the most lessons booked should be displayed first. 4

Field(s) and calculation(s)	forename surname Sum(lessonDuration)
Table(s)	Instructor, Booking
Search criteria	
Grouping	~~Instructor~~ forename surname
Sort order	

Response 2

(d) Design a query to display the forename, surname and the number of lessons booked for each instructor.

The instructor who has the most lessons booked should be displayed first. 4

Field(s) and calculation(s)	forename, surname, count(InstructorID) as [mostlessons]
Table(s)	Instructor, Booking
Search criteria	Instructor.InstructorID = bookings bookingID
Grouping	InstructorID
Sort order	[mostlessons] DESC

Question 18(c)(ii)

Response 1

(ii) Explain the operation of lines 74 to 76 during the first iteration of the loop. 2

The program is comparing the list to the newlist and if ~~they~~ they are not equal to one another then the position is incremented, which then sets the list and newlist to be equal

Response 2

(ii) Explain the operation of lines 74 to 76 during the first iteration of the loop. 2

This will only add the value to the newlist if the value has not already been entered. If the value in the original list is not equal to the last value (the newest in newlist). Then it will increment the counter and add it to the newlist array.