Question 9(d)

(d) The number of guests who stayed at the campsite each night in 2023 is stored in the array `guests`.

Index	0	1	2	...	364
Value	271	240	153	...	87

The campsite want to know the total number of guests who stayed at the site in 2023.

Using a programming language of your choice, write the code to calculate this total. 4

Marking instruction for question 9(d)

	(d)		• set running total to 0
			• loop 365 times
			• running total adding `guests` to total in loop
			• use of incrementing array index in running total
				4	If a collection loop is used award the last two bullets for use and increment of the array.eg
					
					`FOR EACH value FROM guests DO`
					`  SET total TO total + value`
					`END FOR`
					
					`for value in guests:`
					`  total = total + value`

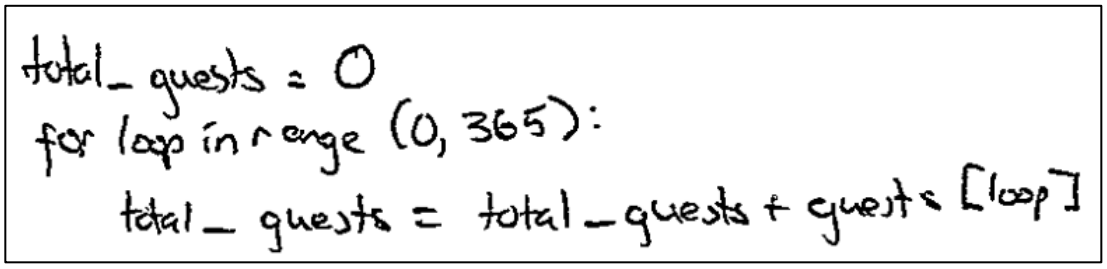
Knowledge that a running total must be initialised and iterated for the correct number of values are both regarded as C grade concepts.
The correct use of array elements and their indexes, within a running total, increase the difficultly of the standard algorithm to include A grade concepts.

Candidates were provided with the array name `guests` in the question and were required to use this in their response. Loop variables, used subsequently as indexes, may be named by the candidate.

The additional guidance notes that an alternative solution could include a collection loop. Although this solution does not explicitly state the number of loop iterations or make use of indexes, this is a perfectly acceptable solution to this problem.

Candidate 1

The candidate was awarded all **4 marks**.



Common errors

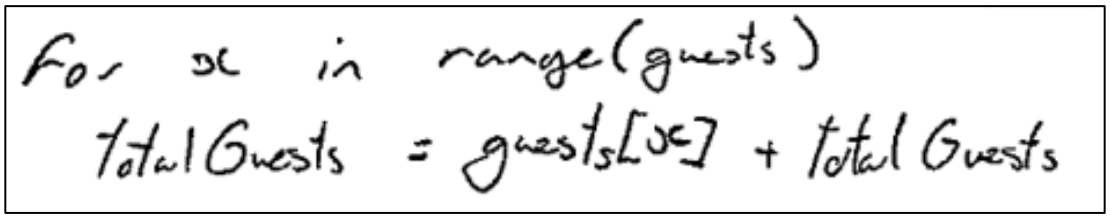
While many candidates showed an understanding of a running total within a loop, some did not initialise the total.

Some candidates did not identify the correct number of iterations. 364 was a common example of this error as candidates forgot to include index 0. Some Python users did identify 0 as the first index but forgot that Python terminates a fixed loop when the upper value is reached.

Many candidates either did not understand the concept of an array, or didn't notice that the table of values is identified as an array in the question. This resulted in a lot of responses including an input statement within the loop.

Further examples of candidate responses are shown below. Marking commentaries can be found in the associated commentaries document.

Candidate 2



Candidate 3

```
For counter = 0 to 364
    guests(counter)=InputBox("Enter
    the amount of guest stayed.")
    total= total + guests(counter)
Next
```

Candidate 4

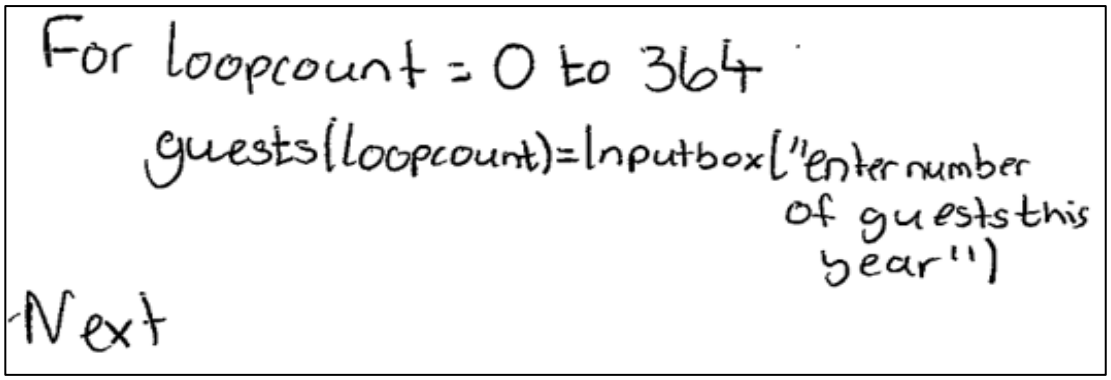
```
for counter in range(0, 364):
    total = (total + guests[counter])
```

Candidate 5

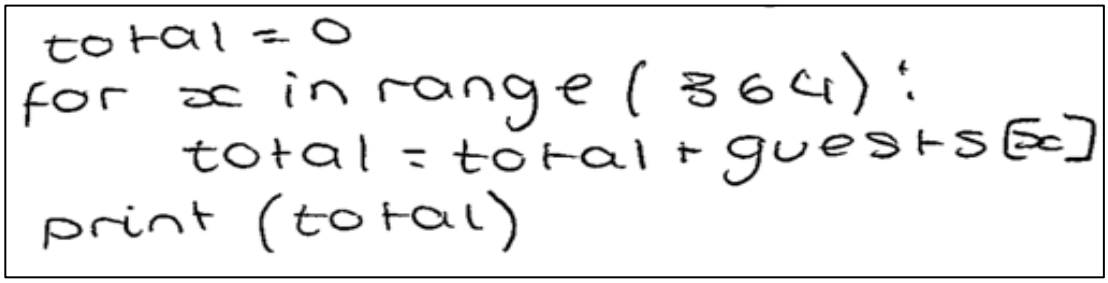
```
total = 0
for index in range(0, 365):
        total = total + guests[index]
```

(python needs an extra iteration of the loop to terminate)

Candidate 6



Candidate 7



Question 11(a)(i)

The design for part of the program is shown below.

```
6.1     Loop 4 times
6.2         Get valid distance for stage
```

(a) The distance of a stage can range from 5 to 75 km.

(i) Using a design technique of your choice, refine step 6.2 to check the user enters a valid distance. 4

Marking instruction for question 11(a)(i)

11.	(a)	(i)	• conditional loop • correct loop condition for valid data from 5 to 75 • input within the loop • error message displayed within loop	4	Where candidate uses a post conditional loop the error message must be contained within an if statement Where candidate does not use a loop, one mark may be awarded for the error message where attached conditions are correct If the loop is missing the start/end of the loop assume that everything above or below the start/end is inside the loop Distances in the question are real values so conditions <=4, >=76 are not valid

Knowledge that input validation requires an input within a conditional are both regarded as C grade concepts.

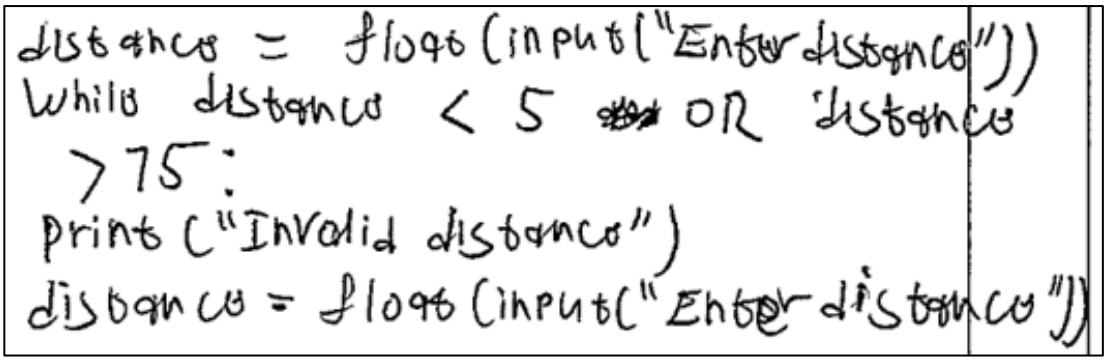
Identifying the correct loop conditions are identified as an A grade mark.

Longer coding or design questions are often allocated an additional A mark as such questions require candidates to work through multiple problem-solving stages to achieve full marks. This question is designed to have 2 C marks and 2 A marks, even although there is only one A grade concept required in the solution.

Candidate 8

The candidate was awarded all **4 marks**.

The additional guidance notes that where the beginning or end of a loop are not clear, it is assumed that all the code above or below the pre or post-conditional loop is inside the loop.



Common errors

Many candidates did not identify that a conditional loop is required to ensure the program does not progress until valid user input is given. Instead, some candidates wrote an IF statement with an error message to provide feedback to the user. This is awarded a maximum of 1 mark.

Candidates often use the incorrect operators when declaring their loop conditions. This can take three forms:

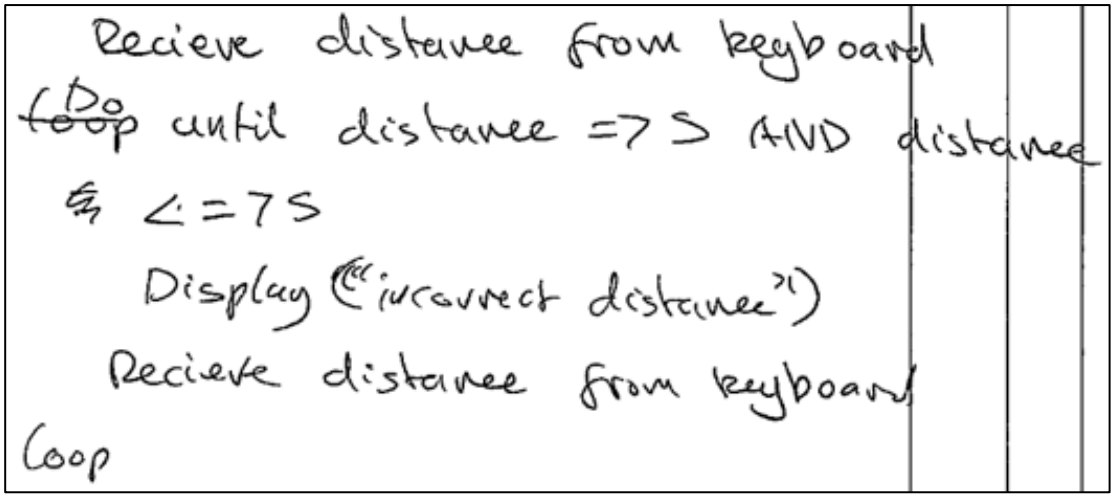
- misuse of >=, >, <, <= to set inclusive limits
- incorrect logic in the use of AND, OR
- incorrect use of the above in relation to the loop being pre or post-conditional

Some candidates who answered using a pre-conditional loop did not include a second input within the loop.

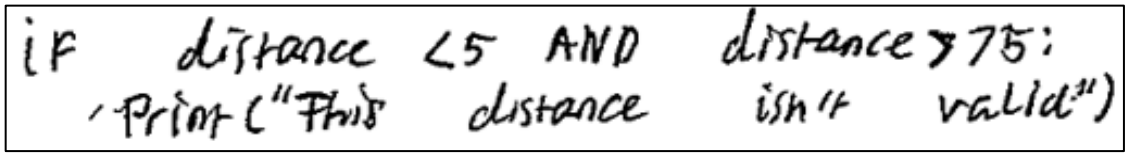
Not including the error message within the loop was also a common error.

Further examples of candidate responses are shown below. Marking commentaries can be found in the associated commentaries document.

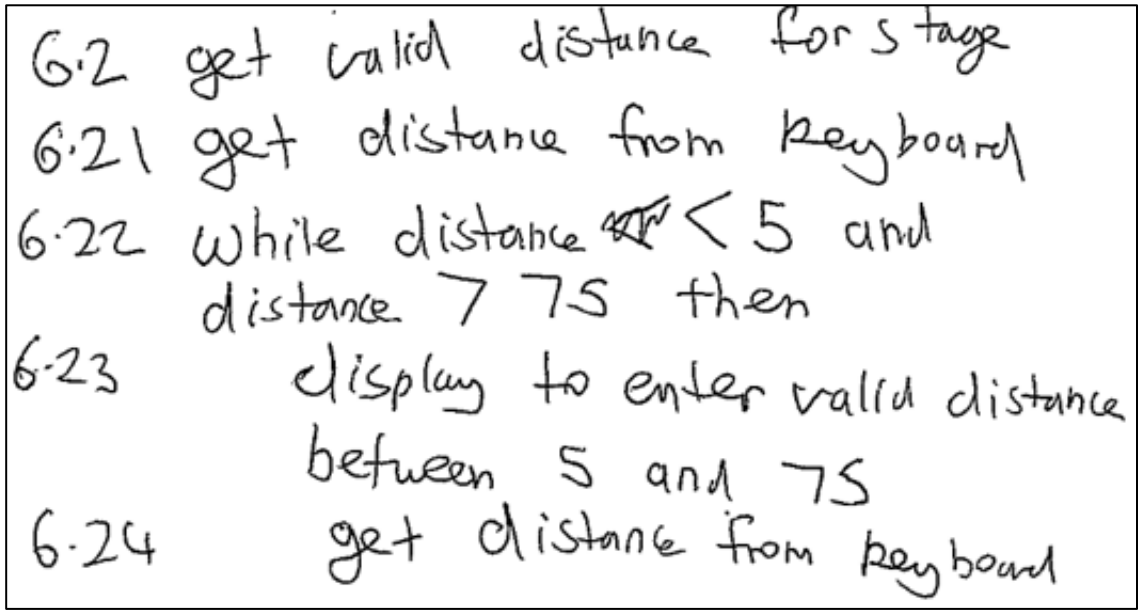
Candidate 9



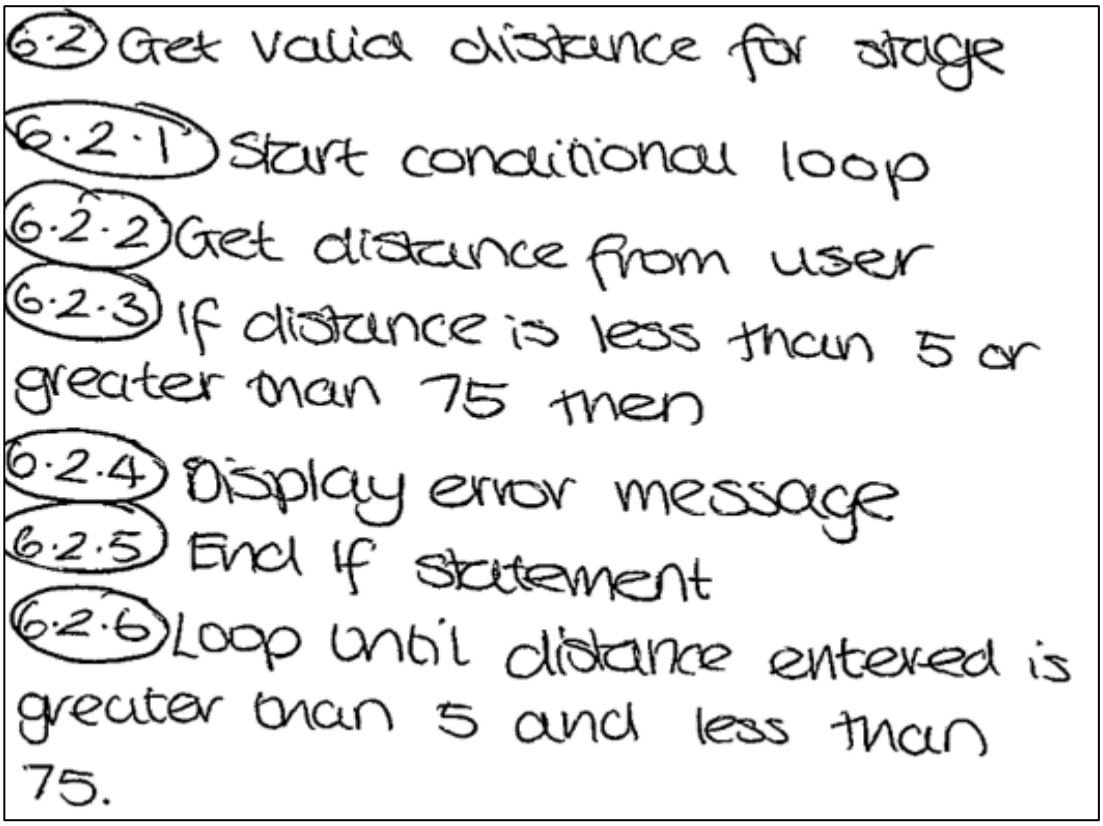
Candidate 10



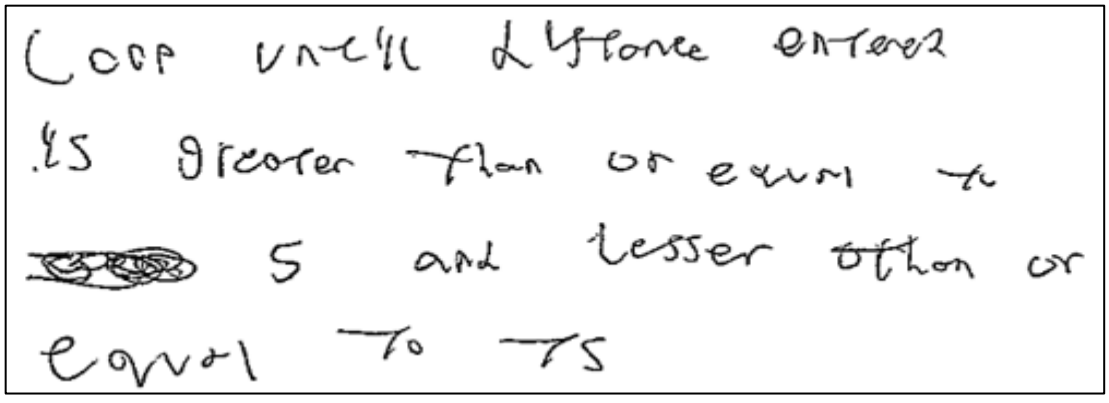
Candidate 11



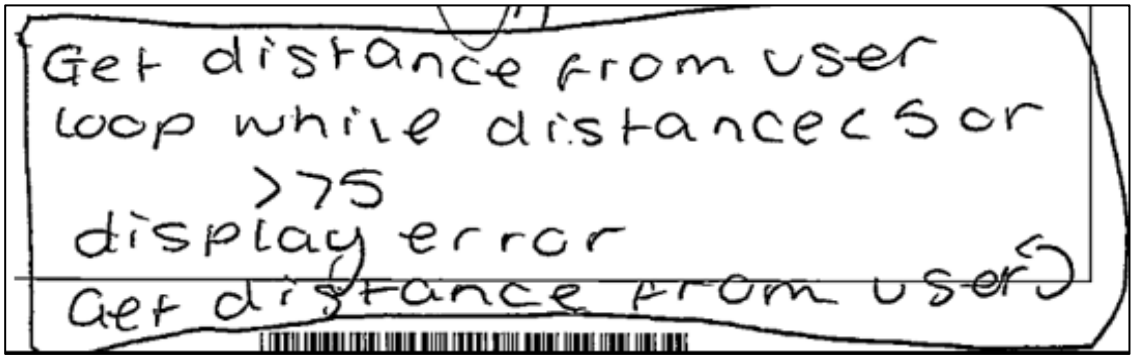
Candidate 12



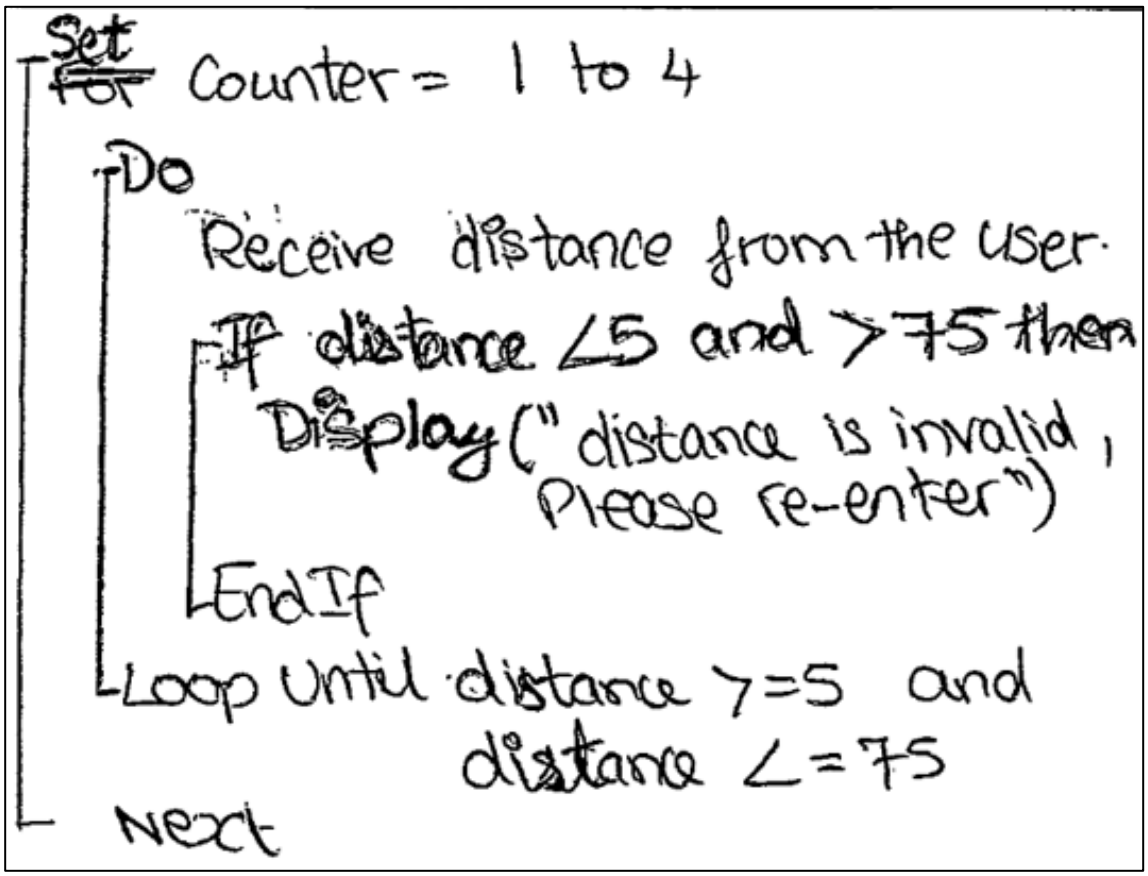
Candidate 13



Candidate 14



Candidate 15



Question 11(c)(ii)

(ii) The code above is inefficient.

Using a programming language of your choice, re-write lines 26 to 34 to make this more efficient. 2

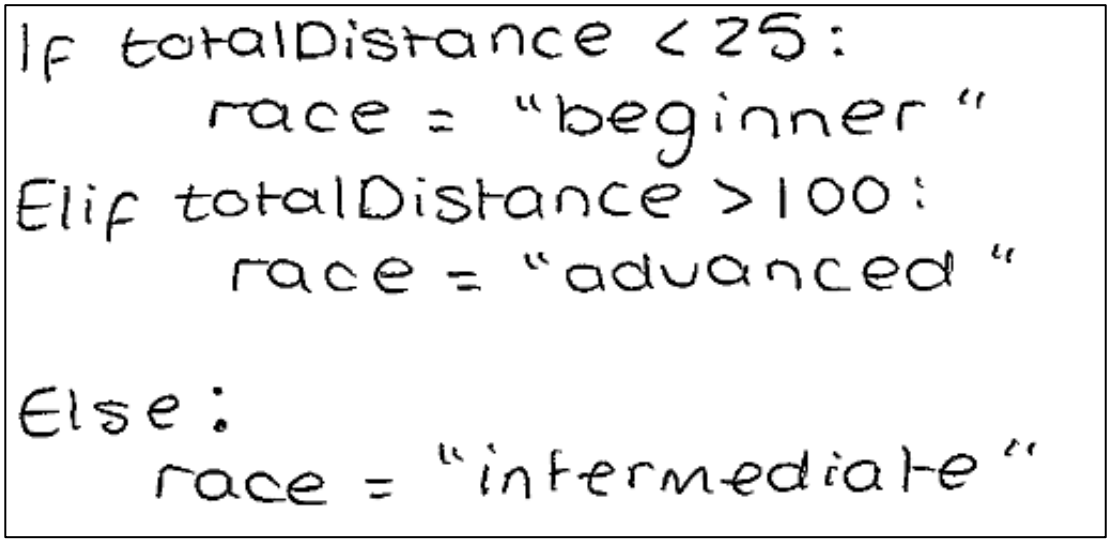
Marking instruction for question 11(c)(ii)

	(c)	(ii)	• change structure to
			– if
			– elseif
			– else/elseif
			OR
			– nested ifs
			
			• rewrite conditions, without complex conditions, with correct assignment to race
				2	IF totalDistance < 25 THEN
					SET race TO "beginner"
					ELSE IF totalDistance <=100 THEN
					SET race TO "intermediate"
					ELSE
					SET race TO "advanced"
					END IF
					
					Note that candidates may change order of conditions and assignments

This question contains 1 C grade and 1 A grade mark. Knowledge that an IF statement is more efficient when it can exit the structure early is regarded as a C grade concept. Rearranging the conditions, within the new structure, requires A grade problem solving.

Candidate 16

The candidate was awarded **2 marks**.



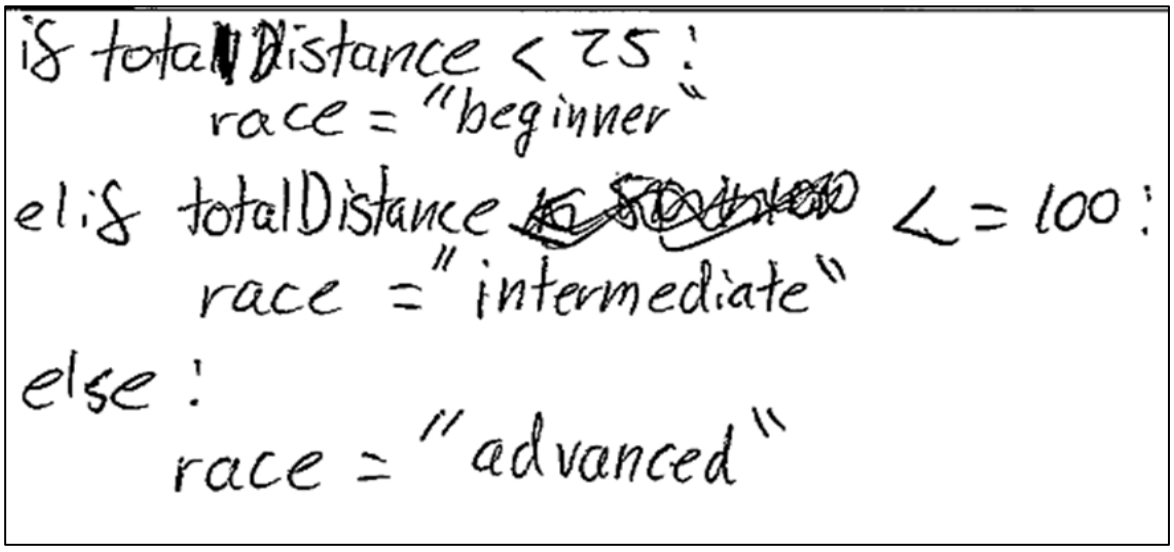
Common errors

While candidates were good at re-structuring the code, they often made errors when reassigning the limits and operators within their new structure.

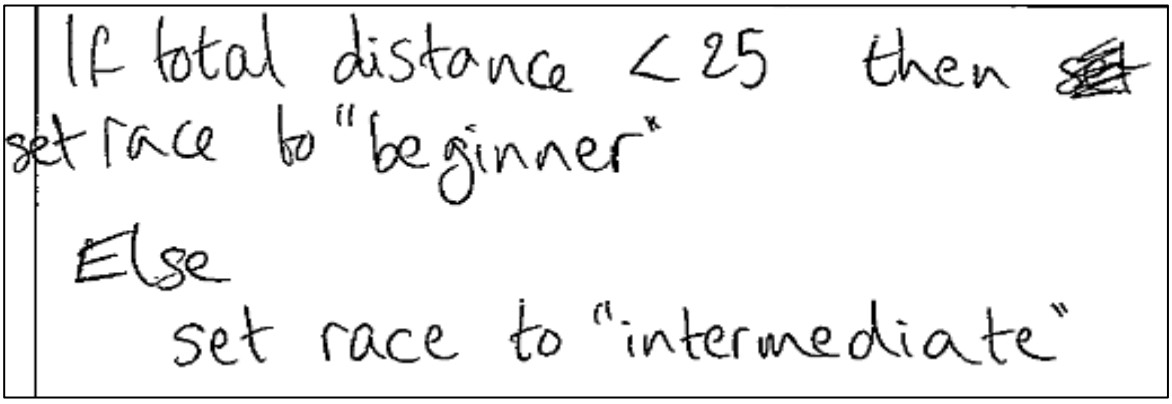
A few candidates retained a complex condition to assign the value ‘intermediate’ so were unable to access the second mark.

Further examples of candidate responses are shown below. Marking commentaries can be found in the associated commentaries document.

Candidate 17



Candidate 18



Candidate 19

```
if totalDistance < 25:
    Race = "beginner"

elif totalDistance >= 25 AND
    totalDistance <= 100:
    Race = "intermediate"

else:
    Race = "advanced"
```

Candidate 20

```
If totalDistance < 25 then
    Set race to "begginer"
Else:
    If totalDistance >= 25 or totalDistance <= 100
    then Set race to intermediate
Else: If totalDistance > 100 then
        Set race to "Advanced"
End If
```

Candidate 21