3.5 Detecting ranges (general)

Range detection using if-elseif-else

An if-elseif-else structure can elegantly detect number ranges, such as under 6, 6 - 7, 8 - 9, 10 - 11, and 12 and up, with each branch performing a different action for each range. Each expression only needs to indicate the upper range part; if execution reaches an expression, the lower range part is implicit from the previous expressions being false.

PARTICIPATION ACTIVITY 3.5.1: An if-elseif-else structure can elegantly detect ranges.

1				
2				
3				
4				
5	5 or under	No teams	If Age < 6:	No teams
6				
7	Under 8	6, 7	Else If Age < 8:	Play on U8 team
8				
9	Under 10	8, 9	Else If age < 10:	Play on U10 team
10				
11	Under 12	10, 11	Else If age < 12:	Play on U12 team
12	12 or over	No teams	Else:	No teams
13				

An if-elseif-else structure can elegantly capture such ranges. When an expression is checked, one knows that all the previous expressions were false, thus defining the low range end.

Feedback?

PARTICIPATION ACTIVITY 3.5.2: Using if-elseif-else to detect increasing ranges.

Indicate the range corresponding to each branch. x is a non-negative integer.

0 - 9	If x < 10 : Branch 1 x is non-negative so may be 0 or greater. x being non-negative, coupled with x < 10, specifies range 0 - 9. 10 is not included due to x having to be less than 10.	Correct
10 - 19	Else If x < 20 : Branch 2 If execution reaches here, the previous expression of x < 10 must have been false, meaning x is 10 or greater, which coupled with x < 20 specifies range 10 - 19.	Correct
20 - 29	Else If x < 30 : Branch 3 If execution reaches here, the previous expression of x < 20 must have been false, meaning x is 20 or greater, which coupled with x < 30 specifies range 20 - 29.	Correct
30+	Else : Branch 4 If execution reaches here, the previous expression of x < 30 must have been false, meaning x is 30 or greater. No upper limit is specified.	Correct

Reset

Feedback?

PARTICIPATION ACTIVITY 3.5.3: More ranges with if-elseif-else.

Indicate the range detected by the expression, assuming each question continues a single if-elseif-else structure. x is an integer. Type ranges as: 25 - 29

1) If x > 100 : Branch 1

101 - infinity

Check Show answer

Correct

101

The expression detects x greater than 100, so the next larger integer is 101.

2) Else If x > 50 : Branch 2

51-100

Check Show answer

Correct

51 - 100

If execution reaches here, the previous expression x > 100 must be false, meaning x is 100 or less. Coupled with x > 50 (meaning x is at least 51), then the range is 51 - 100.

3) Else

-infinity -
50

Check Show answer

Correct

50

The previous expression of x > 50 evaluated to false, meaning x is 50 or less. Because x is any integer, the low range end is -infinity, and the high range end is 50. Note that an if-elseif-else structure can be used not just for increasing ranges, but also for decreasing ranges as for this structure.

4) Is this a reasonable if-elseif-else structure? Type yes or no.

If x < 100: Branch 1
Else If x < 200: Branch 2
Else If x < 150: Branch 3
Else: Branch 4

no

Check Show answer

Correct

No

If execution reaches the expression x < 150, the previous expression of x < 200 must have been false, meaning x is 200 or greater. Thus, x < 150 could never be true at that point in the if-elseif-else structure, so writing such code is not reasonable.

Feedback?