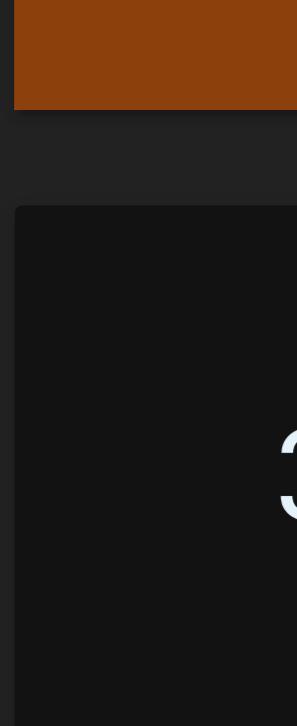


## 3.2 Detecting equal values with branches



Students:  
Section 3.3 is a part of 1 assignment: **CSC108 CH03.1-3.10 P3A**  
 This assignment's due date has passed. Activity will still be recorded, but will not count towards this assignment (unless the due date is changed). See [this article](#) for more info.

Includes: PA  
Due: 02/20/2025, 11:59 PM EST

## 3.3 Detecting ranges with branches (general)

## Detecting ranges using if-else-if-else

A common programming task is to detect if a value lies within a certain range and then perform an action depending on where the value lies. Ex: If Timmy is less than 6, he can play pee-wee soccer. If Timmy is between 6 and 17, he can play junior league soccer, and if he's older than 17, he can play professional soccer.

An if-else-if-else structure can detect number ranges 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

3.3.1: An if-else-if-else structure can elegantly detect ranges.

Start  2x speed

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

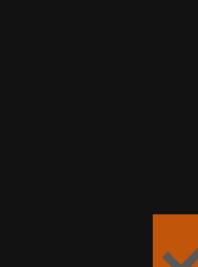
Captions ^

- Kids of various ages may wish to play soccer. A soccer club may not have teams for kids 5 and under.
- One level of teams is listed as "Under 8" (or just U8), which is understood to mean just 7 or 6, but not 5 or younger.
- Likewise, U10 means 9 and 8, and U12 means 11 and 10. No teams exist for ages 12 and over.
- An if-else-if-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

3.3.2: Using if-else-if-else to detect increasing ranges.



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

How to use this tool ▾

0 - 9    20 - 29    30+    10 - 19

If  $x < 10$  : Branch 1Else If  $x < 20$  : Branch 2Else If  $x < 30$  : Branch 3

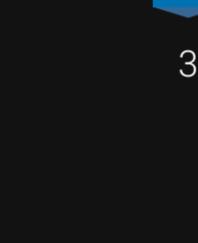
Else : Branch 4

Reset

Feedback?

## PARTICIPATION ACTIVITY

3.3.3: More ranges with if-else-if-else.



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

1) If  $x > 100$  : Branch 1

- infinity

Check Show answer

2) Else If  $x > 50$  : Branch 2

-

Check Show answer

3) Else

-infinity -

Check Show answer

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

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

Else: Branch 4

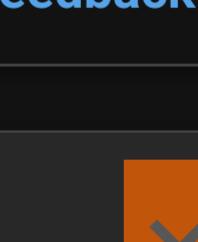
-

Check Show answer

Feedback?

## CHALLENGE ACTIVITY

3.3.1: Decision sequence to detect increasing ranges.



620890\_5010016.qz3zy7

Start

Indicate the smallest and largest numbers in the range detected by the first branch. Assume x is a non-negative integer.



1

2

3

If  $x < 14$ // Range detected:  to Else If  $x < 29$ 

Else

1	2	3
---	---	---

Check

Next

Feedback?

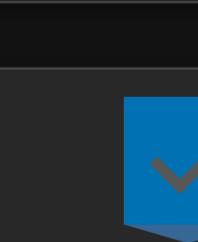
## Using multi-branch if-else to detect ranges

The sequential nature of multi-branch if-else statements is useful to detect ranges of numbers. In the following example, the second branch expression is only reached if the first expression is false. So the second branch is taken if userAge < 16 is false (so 16 or greater) AND userAge < 25, meaning userAge is between 16 - 24 (inclusive).

## PARTICIPATION ACTIVITY

3.3.4: Using if-else-if for ranges: Insurance prices.

Full screen



Start

Variables

0 userAge integer

0 insurancePrice integer

Input

Output

22
----

-
---

ENTER EXECUTION	STEP	RUN	Execution speed Medium
-----------------	------	-----	------------------------

Feedback?

Check

Show answer

## PARTICIPATION ACTIVITY

3.3.5: Decision sequences and ranges.



Type the range for each branch. Type ranges as 25 - 29, or as 30+ for 30 and up.

1) Range for  $x = 2$ 

-

Check Show answer

2) Range for  $x = 3$ 

-

Check Show answer

3) Range for  $x = 4$ 

-

Check Show answer

Feedback?

## CHALLENGE ACTIVITY

3.3.2: Flowchart decision sequence to detect increasing ranges.



620890\_5010016.qz3zy7

Start



Type the range for the given branch. Assume x is a non-negative integer.

Range for  $y \leq 1$ :  .. Else If  $y < 2$ Else If  $y < 3$ Else If  $y < 4$ 

Else

Check

Next

Feedback?

How was this section?

Provide section feedback

Activity summary for assignment: CSC108 CH03.1-3.10 P3A

Due: 02/20/2025, 11:59 PM EST

This assignment's due date has passed. Activity will still be recorded, but will not count towards this assignment (unless the due date is changed). See [this article](#) for more info.

163 / 163 points

163 / 163 points submitted to BlackboardLearn

Completion details

3.4 Detecting ranges with branches