Practice 6: Grade Classifier

Implementation of nested conditionals (if / else / if)
Module 2: Flow Control

Beyond "Yes" or "No"
In the previous practice, we learned to choose between two paths. But what if we have many options? For example, a grade can be Fail, Pass, Good, Great, or Excellent. To solve this, we use **nested conditionals**: putting an "if" block inside another "else".

Objectives of this practice

- Learn to chain multiple decisions (nesting).
- Use logical comparison operators ($>$, $<$, $=$).
- Optimize the order of conditions for program efficiency.

Key Concepts: Nesting

When a condition fails (it goes to the *else* path), we can immediately ask another question.

Logical Structure

- **Is the grade less than 5?** $\rightarrow$ Fail.
- **Else, is the grade less than 6?** $\rightarrow$ Pass.
- **Else, is the grade less than 7?** $\rightarrow$ Good.
- ...and so on.

THE CHALLENGE: The Automatic Teacher

Create a program that asks for a numerical grade (from 0 to 10) and returns the descriptive grade.

Scale to program:

- Less than 5: **FAIL**
- From 5 to 5.99: **PASS**
- From 6 to 6.99: **GOOD**
- From 7 to 8.99: **GREAT**
- From 9 to 10: **EXCELLENT**

Instructions in Snap!:

1. Use the `ask [Enter the grade] and wait` block.
2. Place an `if <(answer) < (5)> else` block.
3. **Inside** the **else** slot, drag **another** `if / else` block.
4. Repeat the process until all options are covered.

Solution Pseudocode

Notice how each `If` closes at the end, creating a "staircase" structure:

```
Algorithm GradeClassifier
   Define grade As Real
   Write "Enter your numerical grade:"
   Read grade

   If (grade < 5) Then
      Write "Fail"
   Else
      If (grade < 6) Then
         Write "Pass"
      Else
         If (grade < 7) Then
            Write "Good"
         Else
            If (grade < 9) Then
               Write "Great"
            Else
               Write "Excellent"
            EndIf
         EndIf
      EndIf
   EndIf
EndAlgorithm
```

Programmer's Tip

Notice that we don't need to ask if the grade is greater than 5 AND less than 6 at the same time. Since we are in the **else** of "less than 5", the computer **already knows** the grade is 5 or more. This saves a lot of code!

In Python, to prevent the code from shifting too far to the right, the magic word `elif` (a blend of else and if) is used.