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The 7 'Quality Tools'

Pareto Analysis, Cause and Effects Analysis, Checksheets,
Control Charts, **Flow Charts**, Histograms and Scatter Diagrams

Flowcharts

Contents

- What are flowcharts?
- Basic Flowchart Shapes and Definitions
- Flowchart Example: Brewing Coffee
- Flowchart with Horizontal Swimlanes
- Flowchart with Vertical Swimlanes

A “Swimlane” indicates the department or system responsible for a specific part of the workflow or process.

“If you can't describe what you are doing as a process, you don't know what you're doing.”

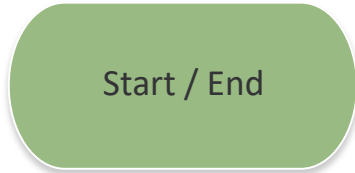
[W. Edwards Deming](#)



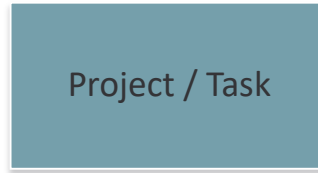
What is a Flow Chart?

- Illustrates the sequence of operations to be performed to get to the solution of a problem.
- Process prior to improvement
- “at a glance”

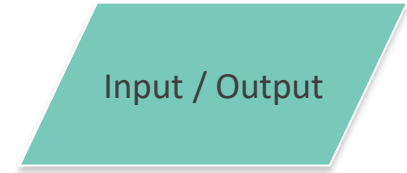
Basic Flowchart Shapes and Definitions



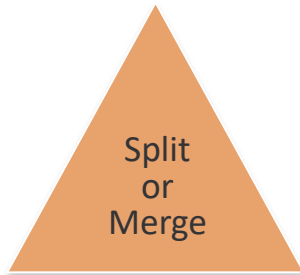
The start or end of a workflow.



Process or action.



Data: Inputs to, and outputs from, a process.



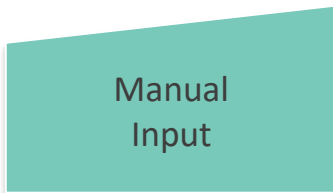
Upright indicates a process split, inverted indicates a merge of processes.



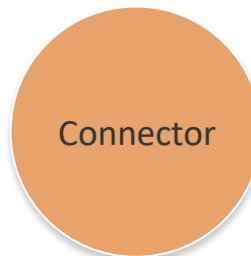
Decision point in a process or workflow.



Document or report.



Prompt for information, manually entered into a system.



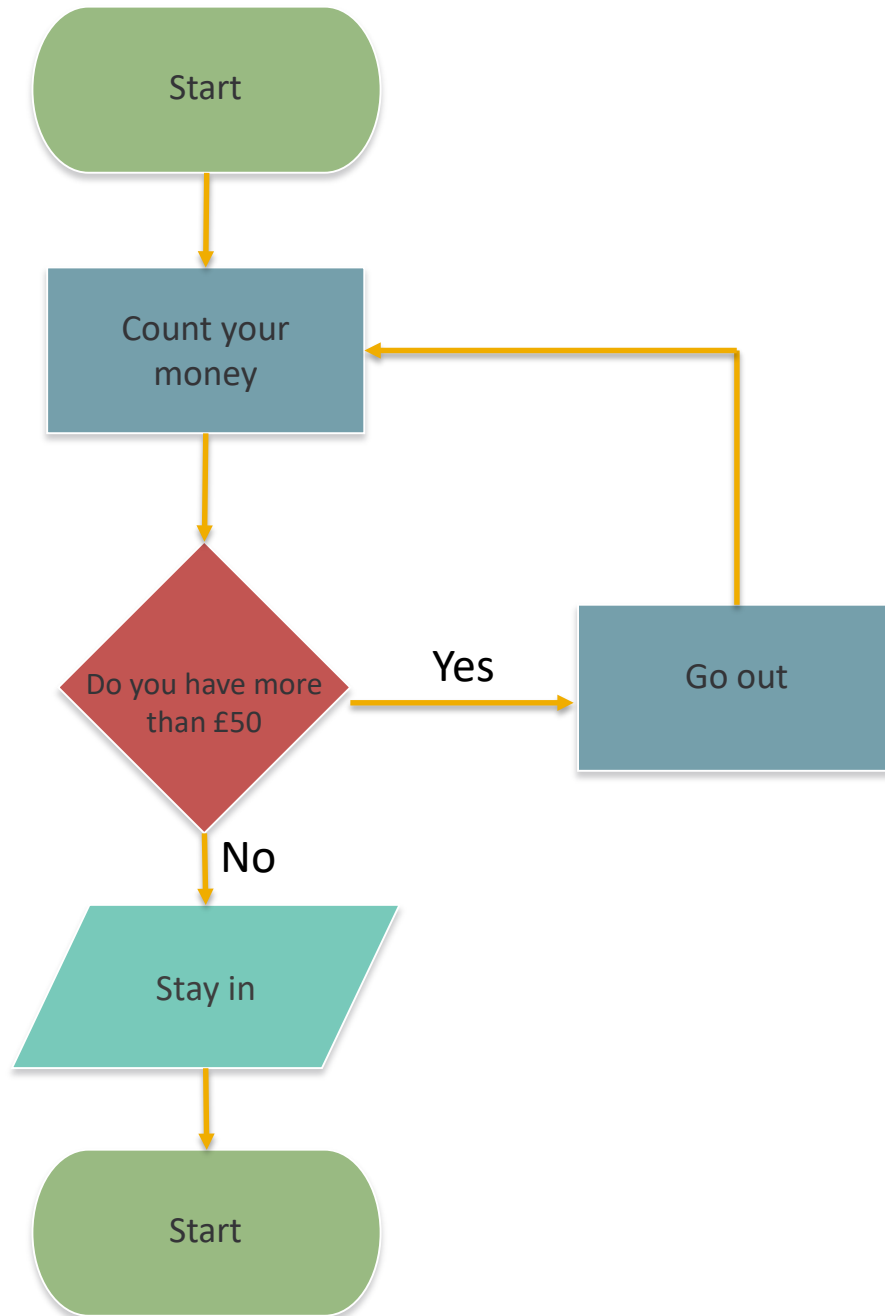
Used to connect one part of a flowchart to another.



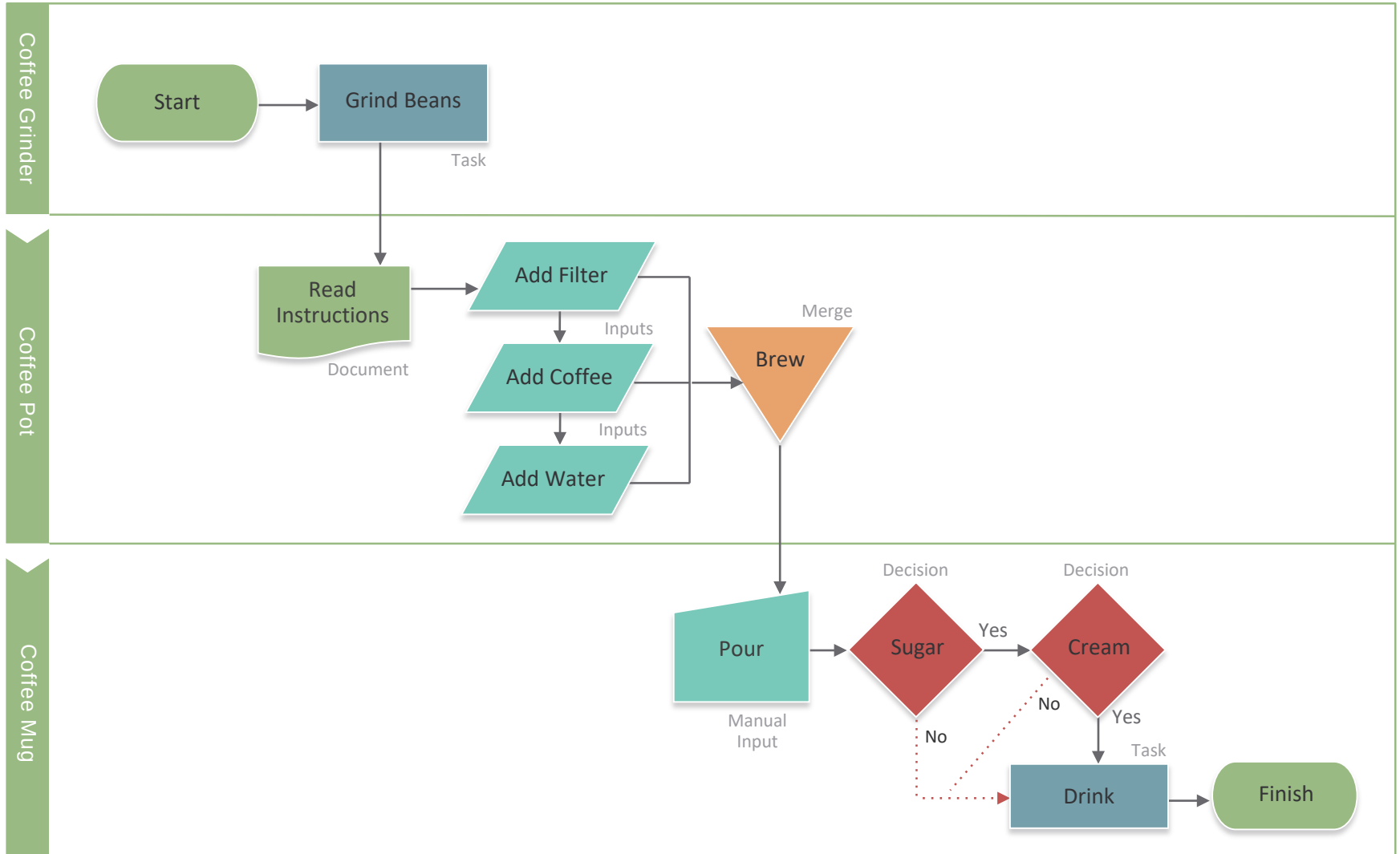
Connector used to connect one page of a flowchart to another.

Flow Chart

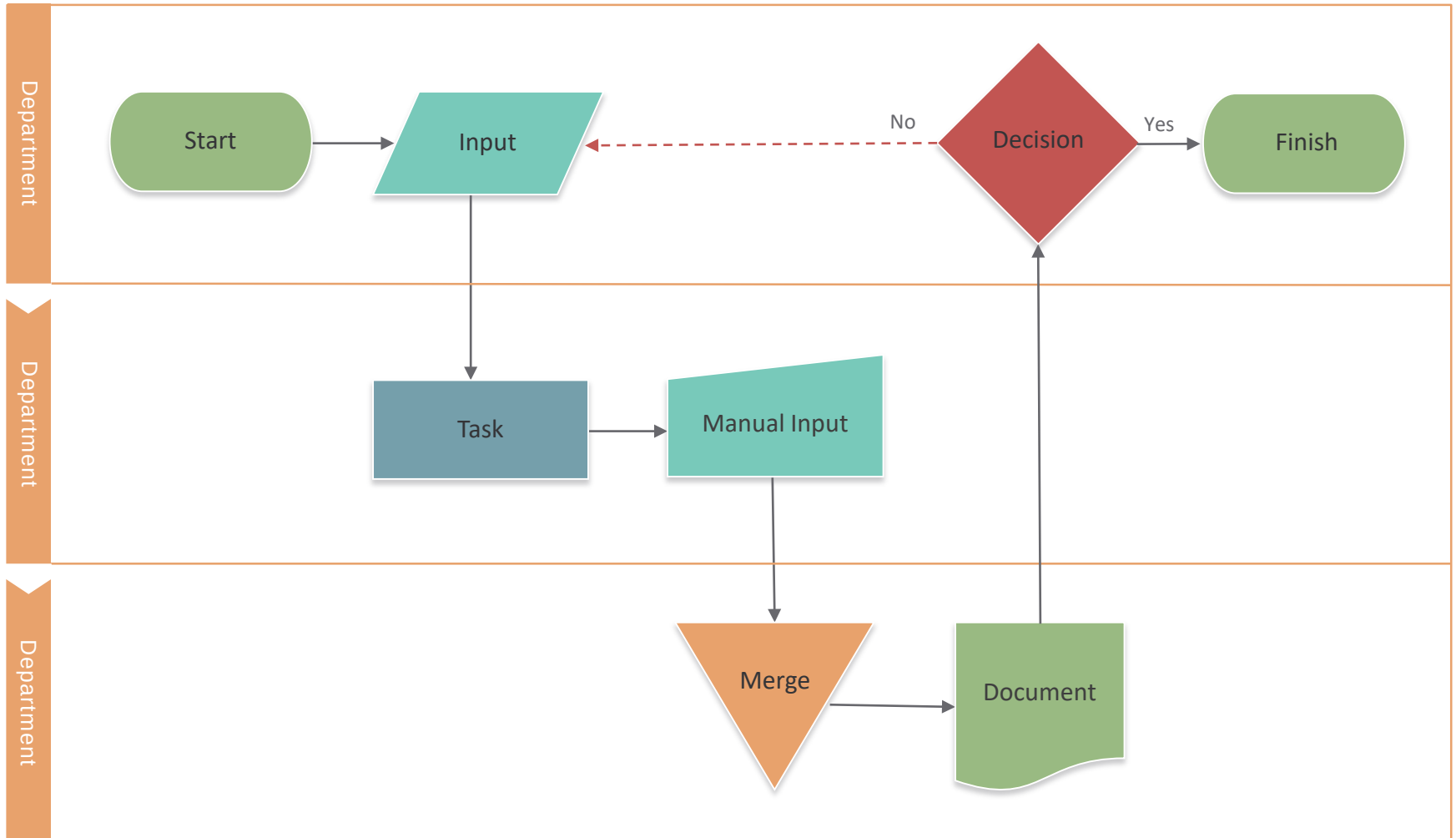
A simple example



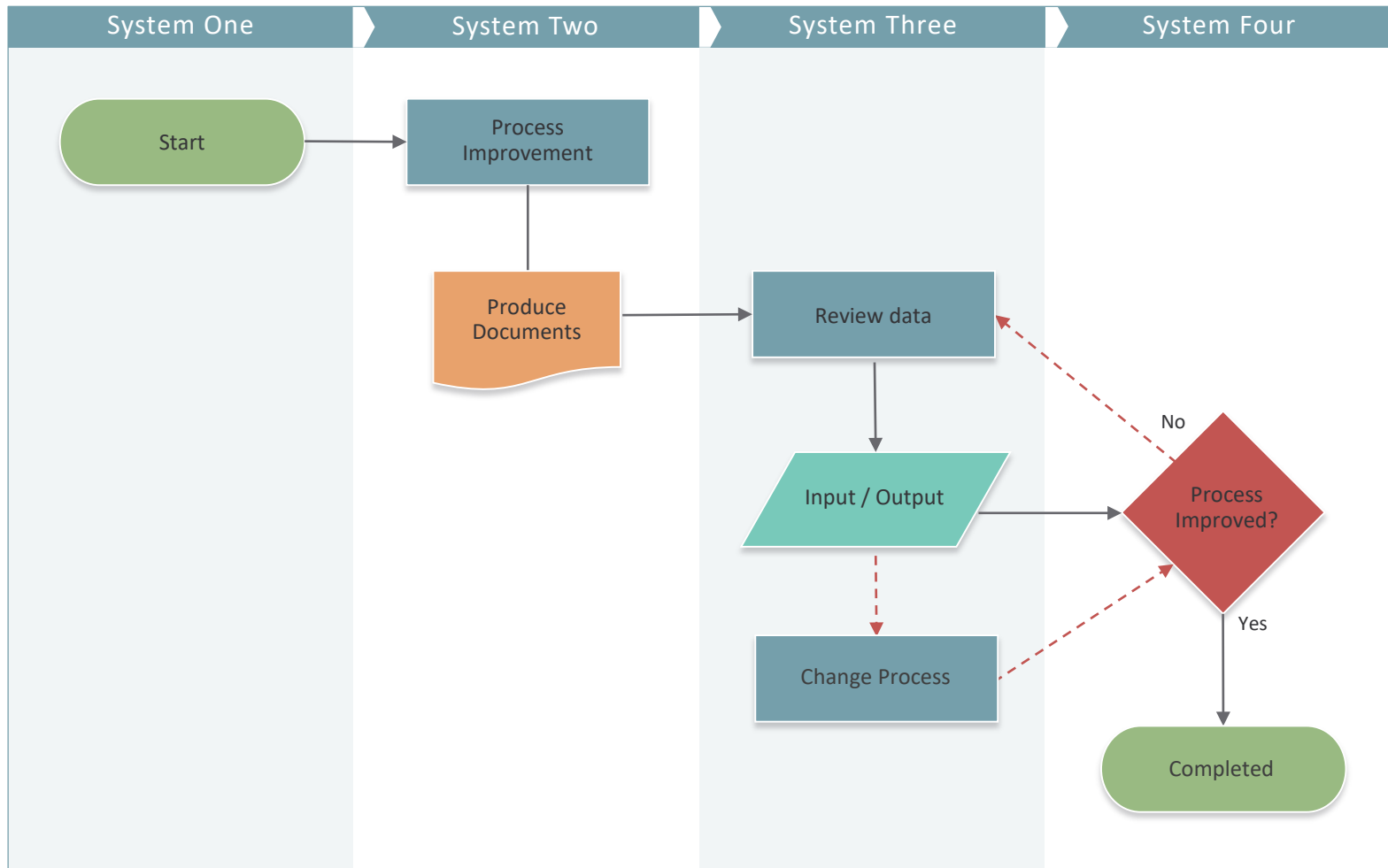
Flowchart Example: Brewing Coffee



Flowchart with Horizontal Swimlanes



Flowchart with Vertical Swimlanes



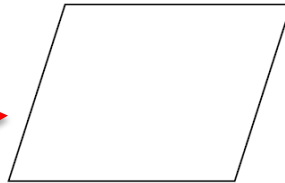
Review

- What do each of the following symbols represent?

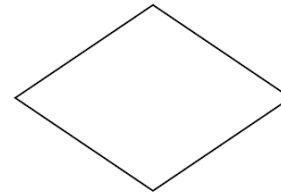
Terminal



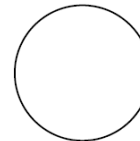
Input/output
operation



Process



Decision



Connector



Module

Review

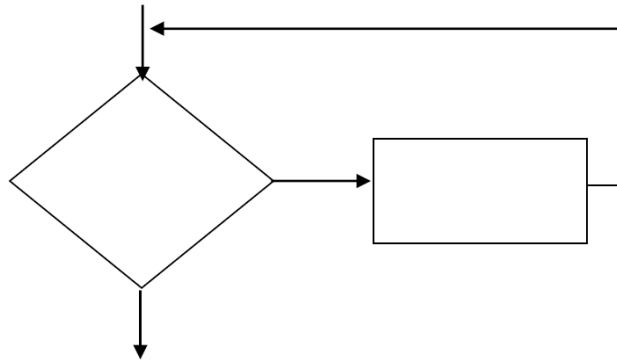
- Name the four flowchart structures.

Answer

- Sequence
- Decision
- Repetition
- Case

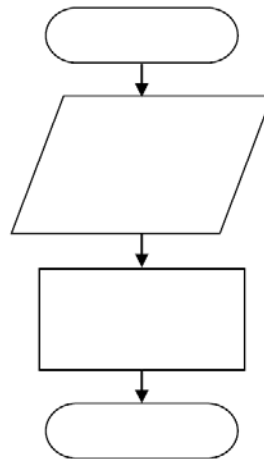
Review

- What type of structure is this? Repetition



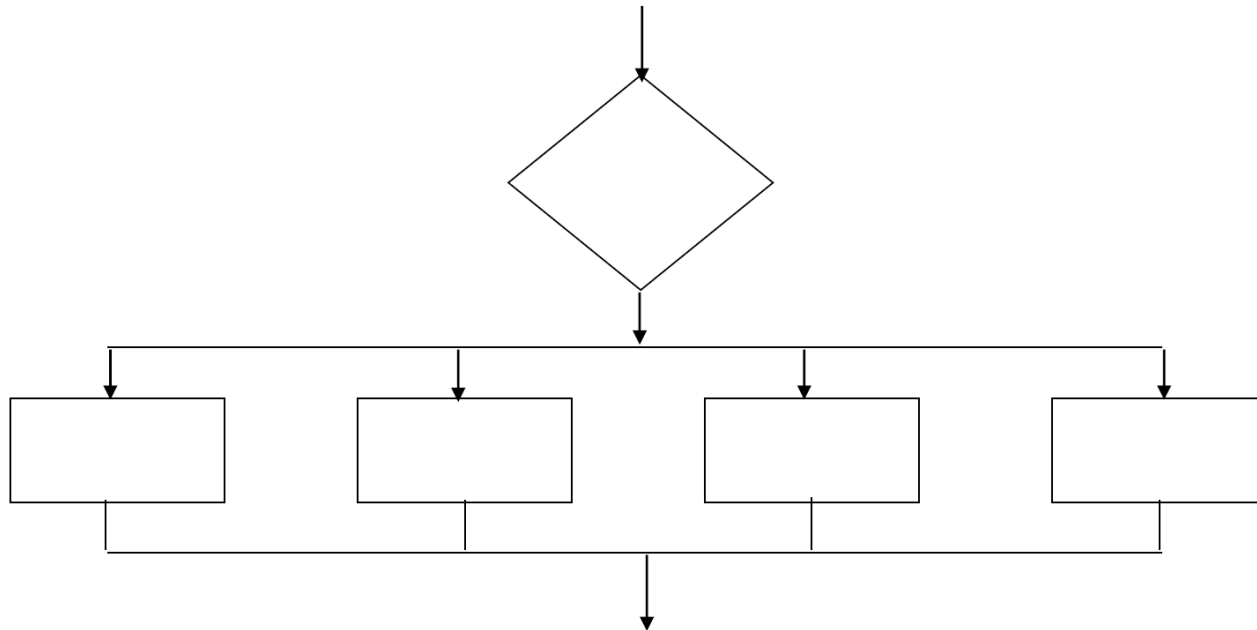
Review

- What type of structure is this? Sequence



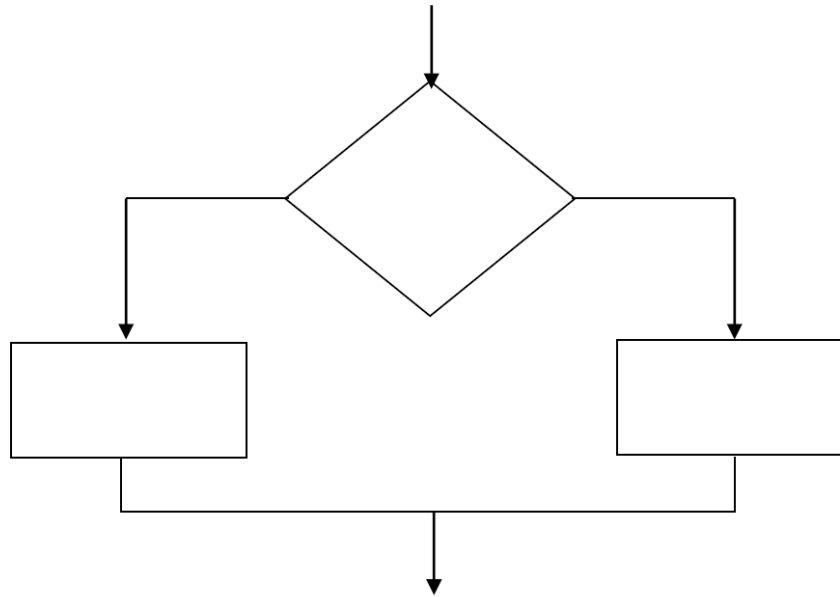
Review

- What type of structure is this? Case



Review

- What type of structure is this? Decision



Pseudocode & Algorithm

- **Example 1:** Write an algorithm to determine a student's final grade and indicate whether it is passing or failing. The final grade is calculated as the average of four marks.