Flowcharts

What is a flowchart?

- A flowchart is a **graphical representation** of a process, algorithm, or workflow.
- Used in computer science to visually depict the **steps of a program**.
- Helps in **designing**, **debugging**, and **understanding** algorithms.

Why do we use flowcharts?

- Simplifies complex problems.
- Helps in organizing thoughts before coding.
- Easier debugging and maintenance.
- Enhances collaboration and communication among developers.

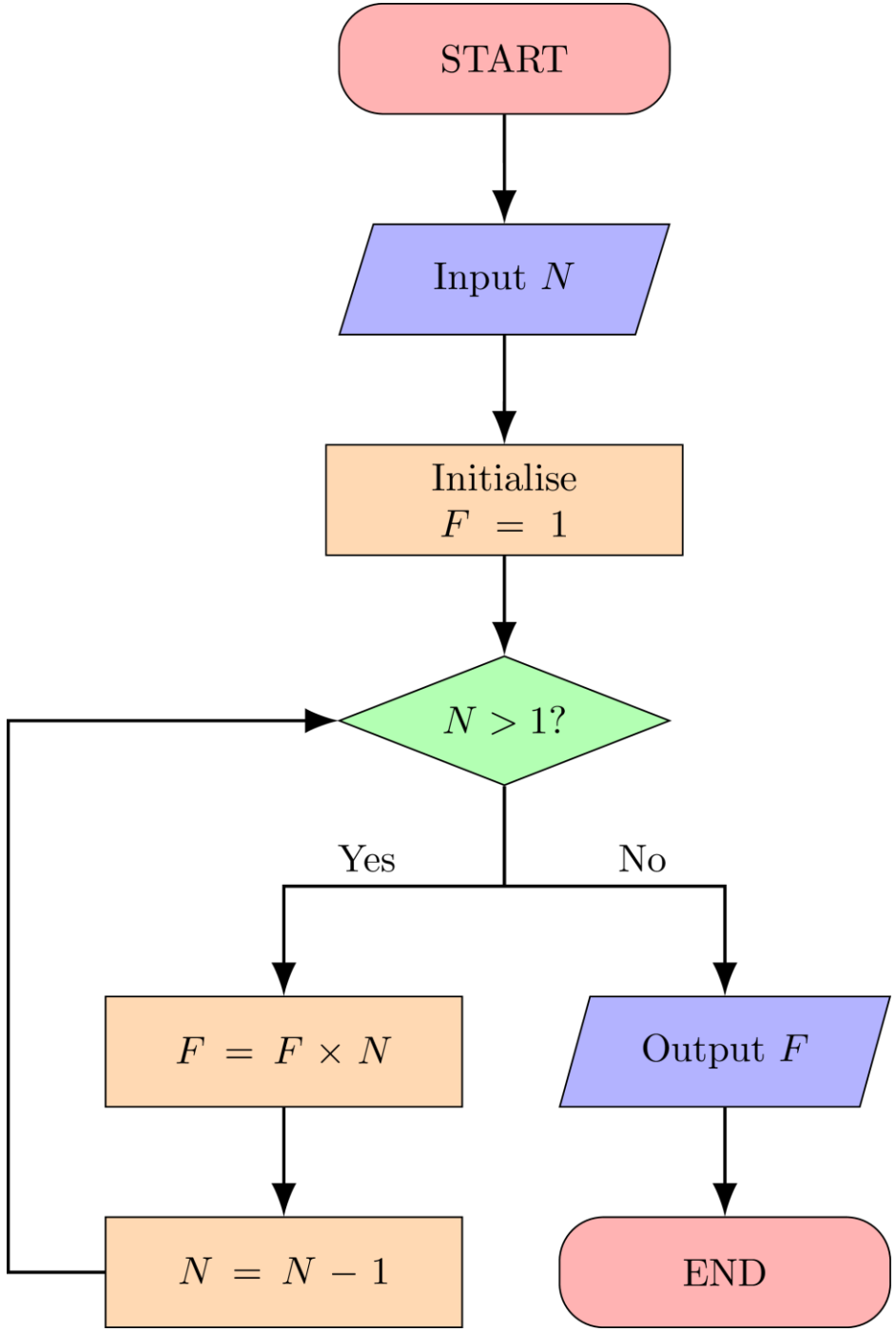
Key symbols in Flowcharts

Symbol	Name	Description
	Terminator	represents the starting or ending point of the system
	Process	indicates some particular operation
	Decision	represents a decision or branching point. Lines coming out from the diamond indicates different possible situations, leading to different sub-processes
	Data	represents information entering or leaving the system
	Arrow	indicates the flow of control between symbols

How to Create a Flowchart

1. **Define the Problem**: Clearly understand the problem you're solving.
2. **Identify the Major Steps**: Break down the process into major steps.
3. **Draw Symbols**: Use the appropriate flowchart symbols for each step.
4. **Connect with Arrows**: Show the sequence of execution using arrows.
5. **Review**: Ensure all conditions, loops, and inputs/outputs are represented correctly.

Flowchart for calculating factorial of a number



Avoiding common mistakes

- **Unclear decision branches**: Make sure all decisions have clear outcomes (yes/no, true/false).
- **Overcomplicating the chart**: Keep it simple; too many symbols can confuse the reader.
- **Disconnected symbols**: Ensure all processes and decisions are connected.
- **Not testing the logic**: The flowchart should follow logical steps without contradictions.

Flowcharting best practices

- Start with a **simple draft** and refine it.
- Keep the chart **readable**, not cluttered.
- Consistent **symbol** usage.
- Use **colour** or **annotations** for clarity.
- **Test** the flowchart by walking through the process manually.

Tools

- **Microsoft Visio** (https://www.microsoft.com/en-gb/microsoft-365/visio/flowchart-software/) – You can use it with your university account

- **Diagrams.net** (https://app.diagrams.net) – Free to use

Practical example