

Flowcharts

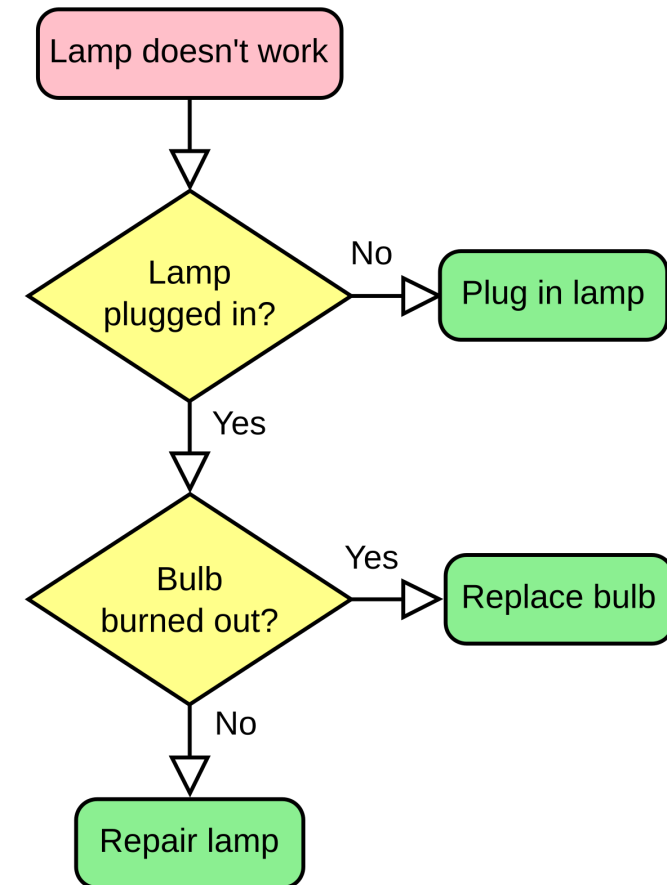


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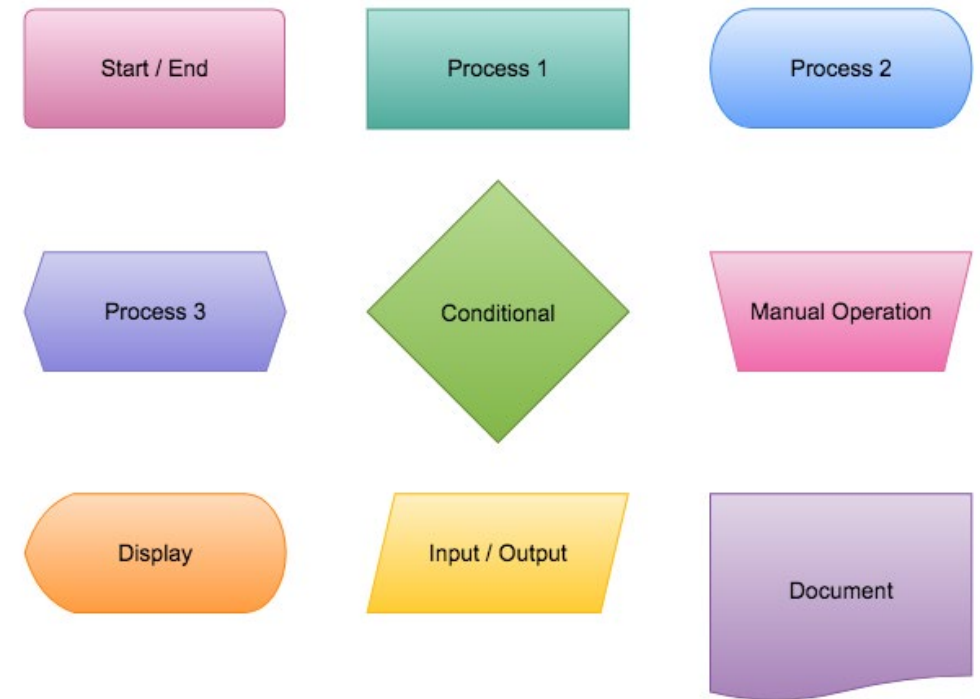
What are flowcharts?

- Flow charts are a visual way of representing a program or system
- They allow us to put a program into a nice middle ground between English and code
- They allow us to easily explain what a program is meant to do before we even start to program it



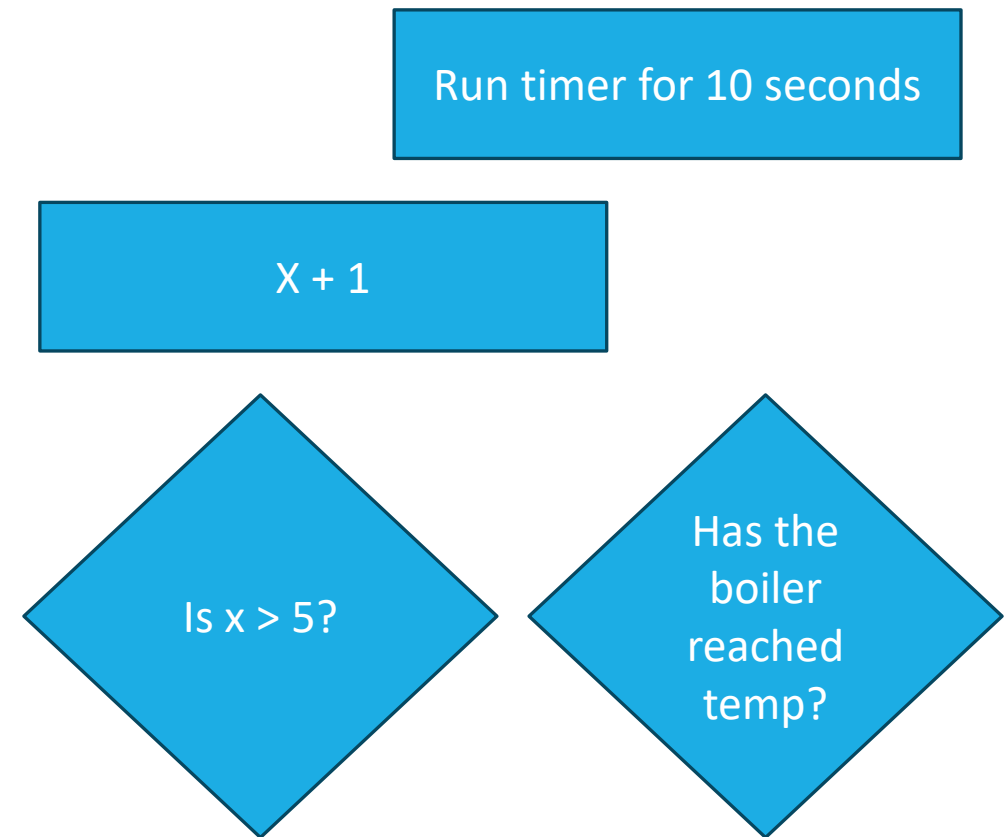
Flowchart Symbols

- We use symbols to represent logic inside our program
- Each symbol has a purpose
- We connect these symbols with arrows to show how they link together (how they “flow”)



Writing Inside of Flowchart Symbols

- When writing our instructions into our flow diagram we use plain English
- The commands should be short and quick to read
- Generally, you put one action per command
- We can use maths and logic notation within our blocks too



Start/End

- Sometimes referred to as the “terminator”
- Used to denote where the flow begins and ends
- Often has “start” or “end” written in them
- Start indicates where the program begins
- End indicates where the program finishes



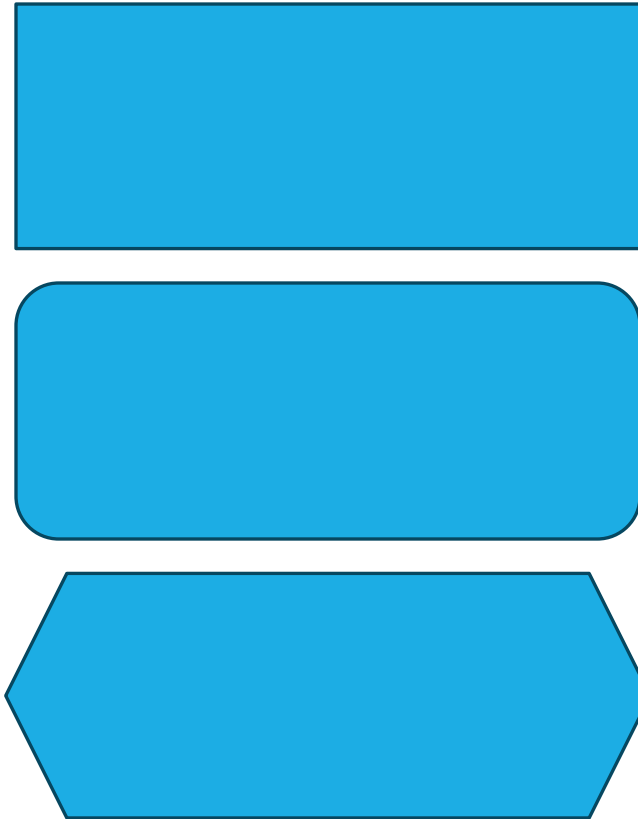
Start



End

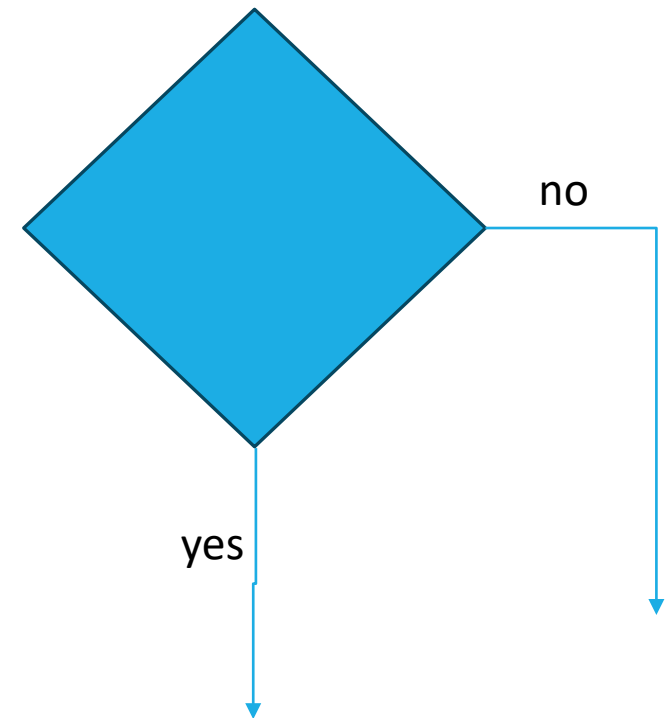
Processes

- A process is used to represent a system performing an action
- For instance, “heat the tea pot”, “check for animal” ect.
- Can be both internal and external parts of the system



Conditional/Decision

- For making a decision in our system or checking if something is true
- Only symbol that has two outputs
- Must be a yes/no (true/false) question
- You write yes or no on the arrow coming from the symbol, yes always comes out the bottom with no from the side
- For example, “has the task been completed?”, “is the kettle boiled?”, “is $x > 5$?”)



Input Output

- Used for information coming into or leaving the system
- Can be used for reading a sensor
- Can also be used for moving an actuator
- For example, “move motor 10 rotations”, “activate solenoid”, “read thermometer”



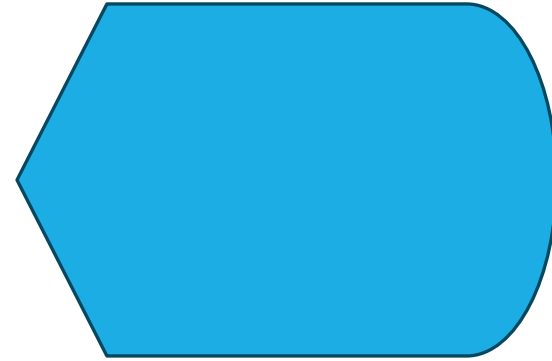
Manual Operation

- Used for a user input
- For example, “the user pressing the button”, “user selecting age”



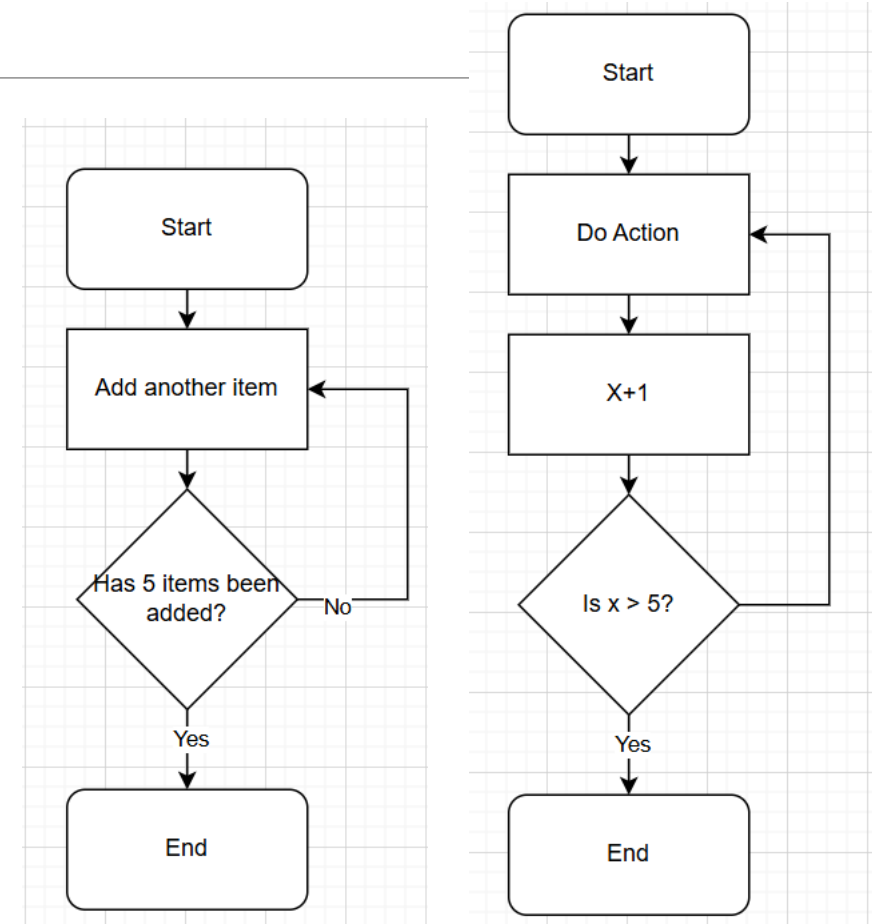
Display

- Displays information to the user
- For example, “output “tea made!!””, “output age input not valid”
- Useful for debugging



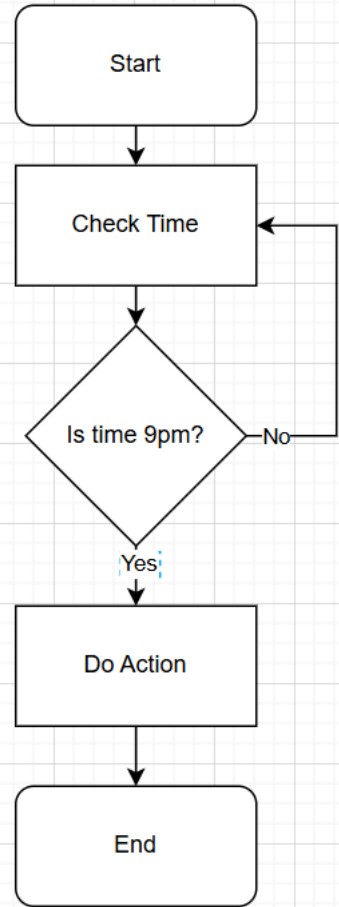
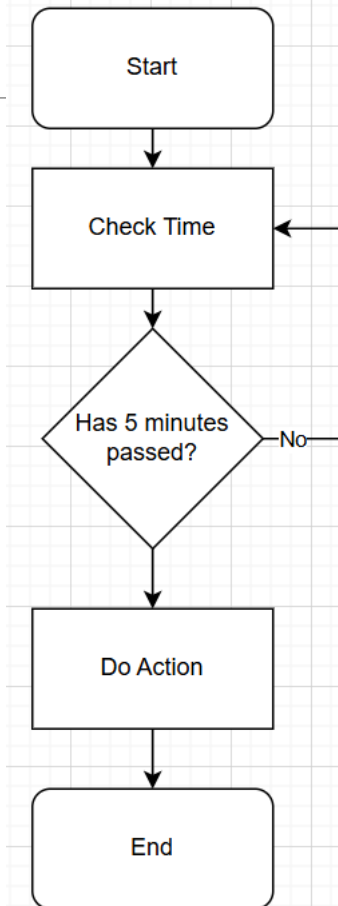
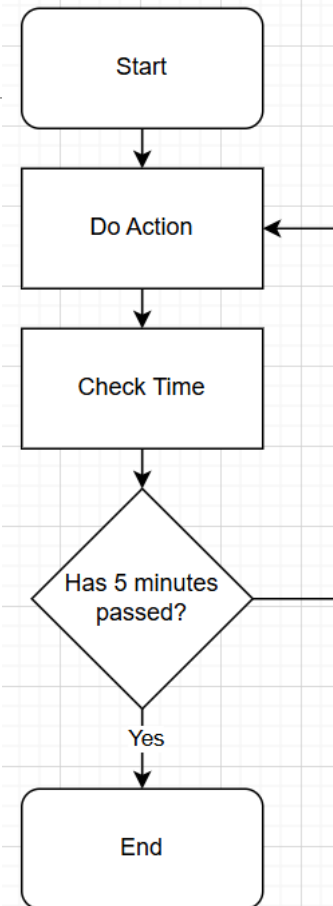
Counting Loop

- Counts how many times something has happened
- Useful for ensuring the correct number of items have been added to something ect.



Timer Loops

- Does an action for the duration of a timer
- Useful for timed circuits
- Can either do action after a set time or do action for a set time



Common Mistakes

- Using the wrong symbols
- Flowing in the wrong directions
- Using too many or not enough colours
- Inconsistent branch directions
- Inconsistent spacing