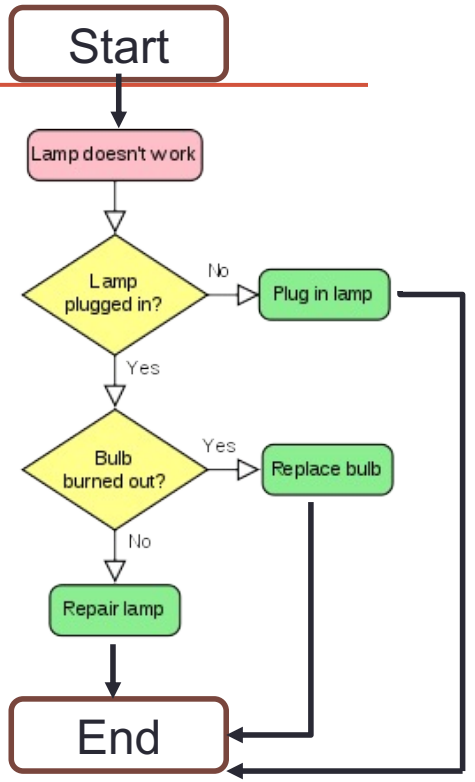
CISC 1003 - EXPLORING ROBOTICS

FLOWCHARTS


Start
Lamp doesn't work
Lamp plugged in?
No
Plug in lamp
Yes
Bulb burned out?
Yes
Replace bulb
No
Repair lamp
End

Flowcharting

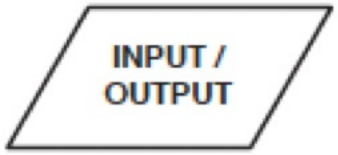
- The four common symbols used in flowcharting are:
  - Start and Stop
  - Input and output
  - Decisions
  - Process

Flowcharting

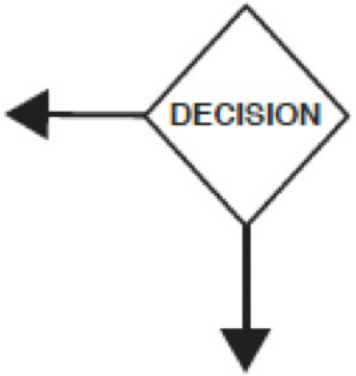
- Start and stop:

  - The start symbol represents the beginning of the flowchart
    - with the label “start” appearing inside the symbol.
  - The stop symbol represents the end of the flowchart
    - with the label “stop” appearing inside the symbol.
  - These are the only symbols with keyword labels.

Flowcharting

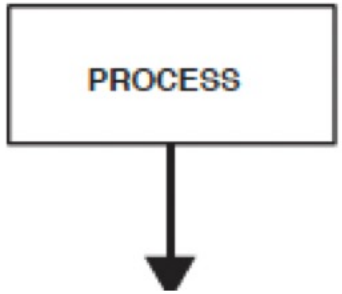


- Input and output:
  - The input and output symbol contains data that is used for input (e.g., provided by the user)
    - and data that is the result of processing (output)
- Decisions:
  - The decision symbol contains a question or a decision that has to be made.

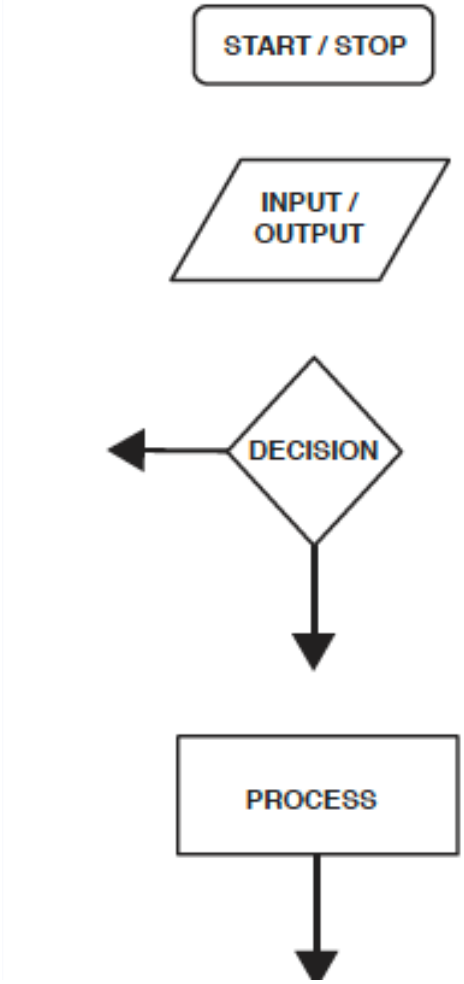


Flowcharting

- Process:
  - The process symbol contains brief descriptions (a few words) of a rule or some action taking place .



Common Flowchart Symbols

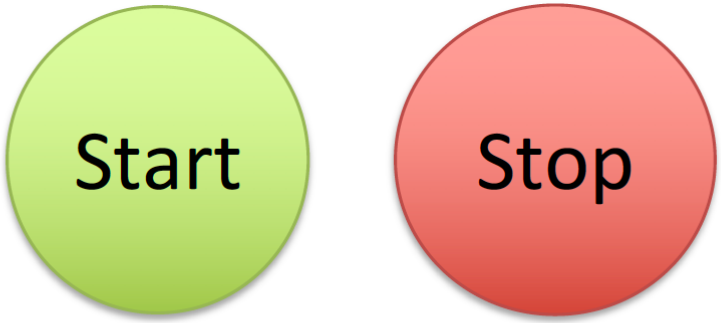


*Robot Programming: A Guide to Controlling Autonomous Robots, C. Hughes and T. Hughes

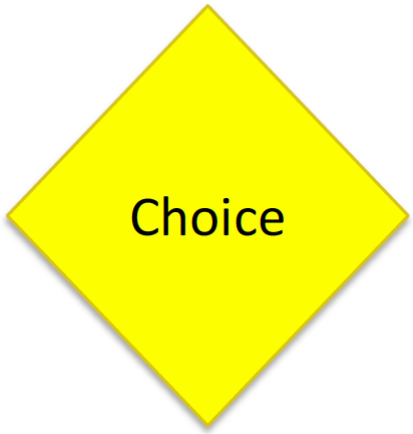
Flowcharts

- Many times, colors are also used to distinguish between different components

Flowcharts have a standard set of shapes and colors that are universally used so that everyone can understand what they mean.



The start and the stop shapes show where the program starts and stops

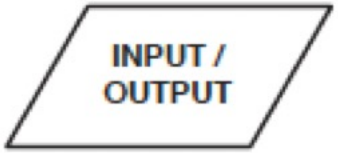


Yellow diamonds represent a choice or decision based on a question. This must be at least a yes/no decision.

These rectangular blocks represent actions in the program

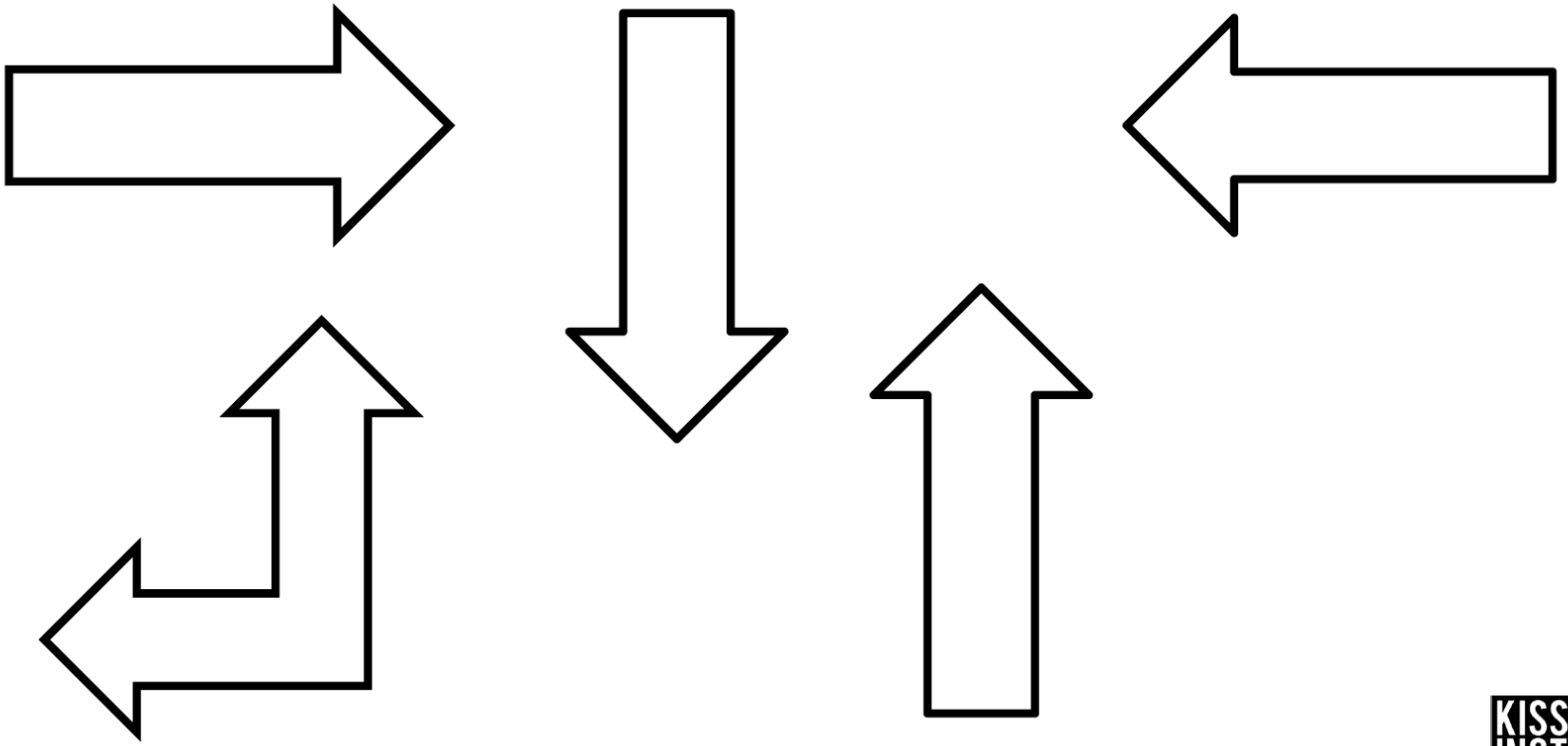
KISS INSTITUTE FOR PRACTICAL ROBOTICS

Flowcharting



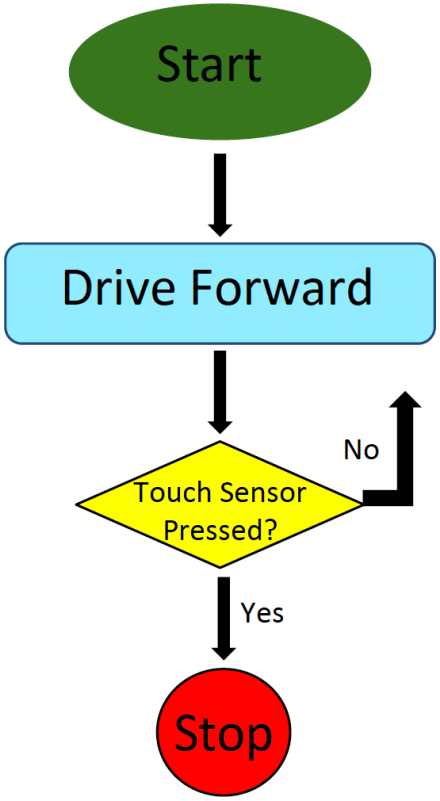
- Input and output:
  - The input and output symbol contains data that is used for input (e.g., provided by the user)
    - and data that is the result of processing (output)

Arrows are used in flowcharts to show the direction, or flow, of the program.

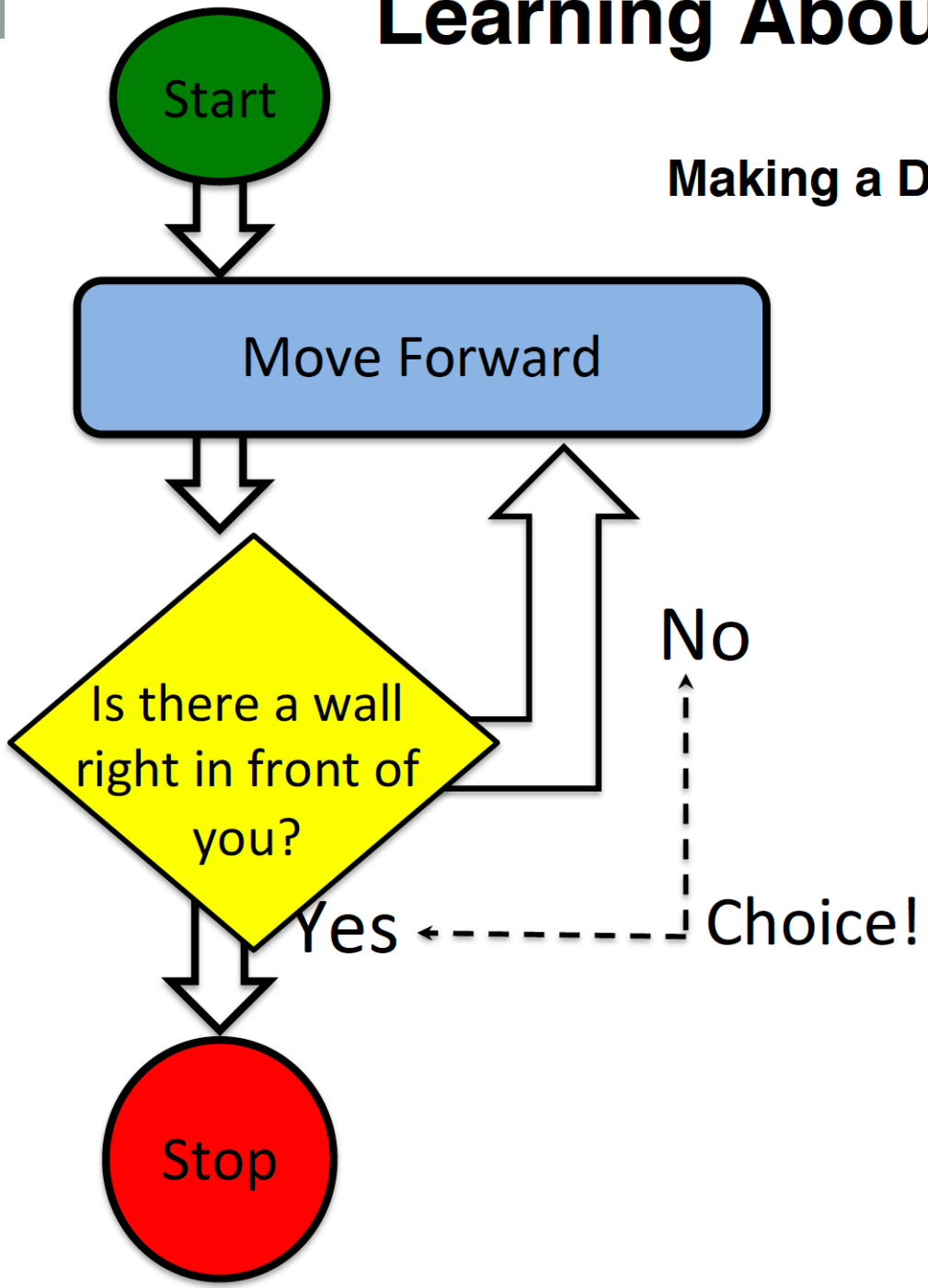


KISS INSTITUTE FOR PRACTICAL ROBOTICS

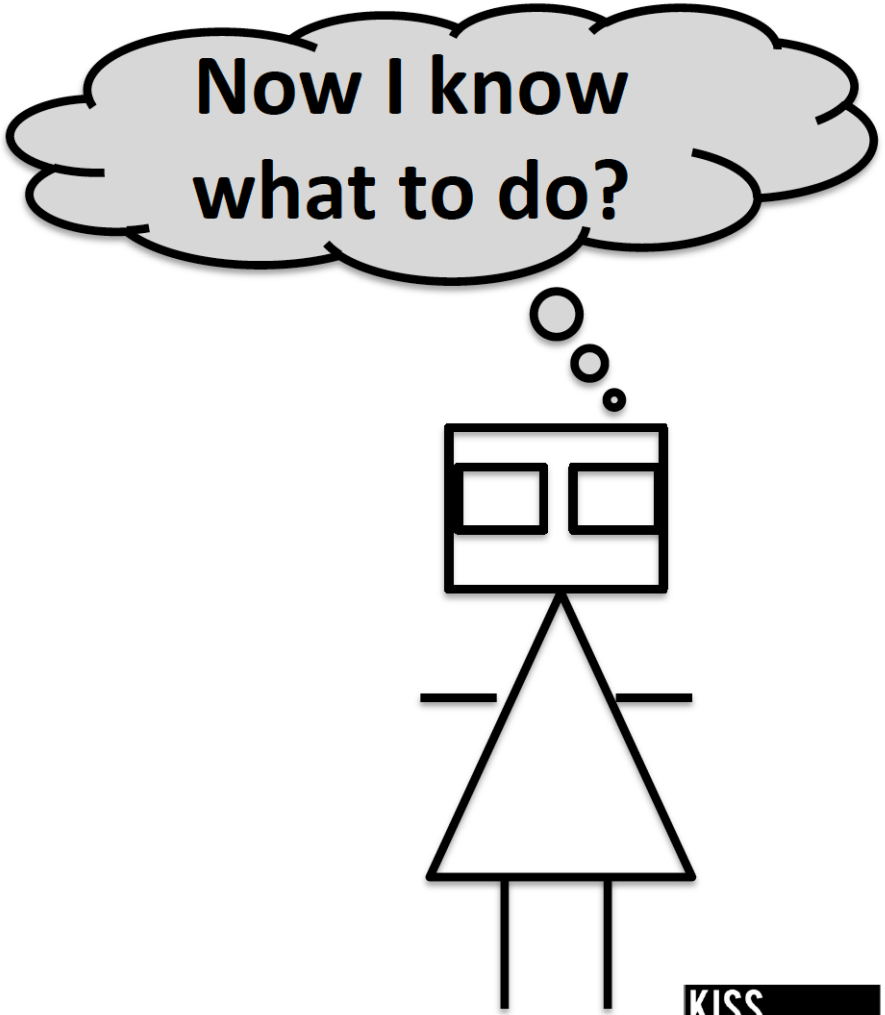
Example: flowchart



Learning About Flowcharts



Making a Decision:



KISS INSTITUTE FOR PRACTICAL ROBOTICS

FLOWCHART EXERCISES

Flowchart Exercise 1

- Robot moves forward as long as its touch sensor is not pressed
  - When the touch sensor is pressed the motors stop and the program ends
- How would you create a flowchart for this program?

Flowchart Exercise 2

- If it’s raining, bring an umbrella

Flowchart Exercise 3

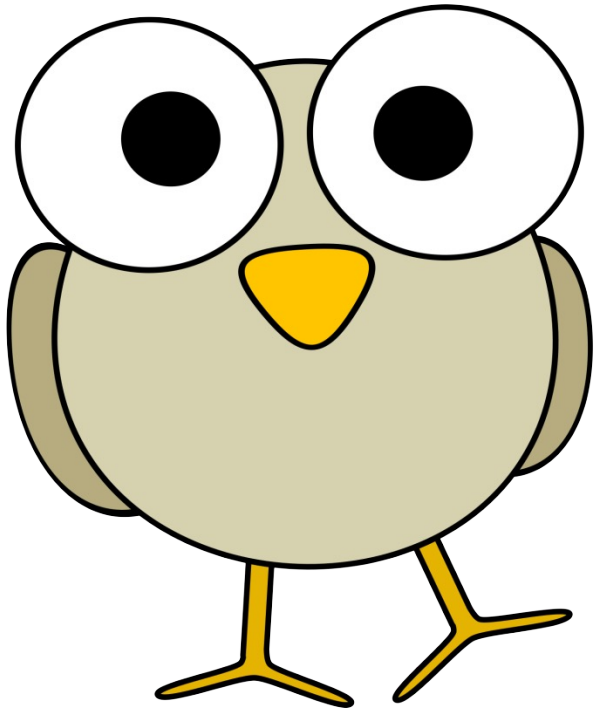
- Create a flowchart for the “blast-off” program:
  - Make a variable called count and set its value to 10.
  - Print Countdown on one line, then move to the next row (line).
  - Using a repeat loop print out the value of count. Each one on a new line.
    - Print out the value of count.
    - Then count change by -1.
  - When the counting is done, write on a new line “blastoff”.

Flowchart Exercise 4

- Get two numbers from the user
- Calculate the sum and print it on the screen

Flowchart Exercise 5

- Turn on oven. Cook turkey for 4 hours or until meat thermometer reaches 180 degrees



??