## Making Choices

## Learning Objectives

* Learn about if, elseif and else
* Learn to test equality, AND, and OR conditions
* Learn to nest loops

**Part 1 – If Statements**

Our programs always do the same stuff

Want programs to make choices

Conditionals

num = 37;

if num>100

disp('number is greater than 100');

else

disp('number is not greater than 100');

end

disp('done')

Try without else block

Logical operators: >, <, >=, <=, == (test if something is true, not assigning)

Function to return sign of number

% function sign\_of.m

function out = sign\_of(num)

if num>0

out=1;

elseif num==0

out = 0;

else

out = -1;

end

AND, OR tests (use whiteboard)

* If (raining && going outside) => bring umbrella.
* If (I’m hungry || I’m bored) => Eat

AND statement (true if both statements are true)

% test if I need an umbrella

raining=1; %it's raining!

going\_outside=0; % not going outside

if raining && going\_outside

disp('better bring an umbrella!')

else

disp('no need for an umbrella!')

end

% test if I should eat

hungry=0;

bored=0;

if hungry || bored

disp('eat!')

else

disp('dont eat....yet...')

end

OR statement (true if either or both statements are true)

% test OR statements

if (1>0)||(3<4)

disp('at least one part is true')

end

CHALLENGE:

* Re-type the if statements in a script
* investigate which conditions are true and which aren’t

**Part 2 - Nesting**

Combining if statements with loops

numbers = [-5, 3, 2, -1, 9, 6]; % list of numbers to test

total = 0; % initialise value to zero

for n = numbers %loops through each element in "numbers" vector

if n >= 0 % checks if the number is positive

total = total + n; %adds it to the total of positive numbers

end % closes the "if" statement

end % closes the "for" loop

disp(['sum of positive values: ', num2str(total)]) %displays the sum

Back to analyse script/function

Use “shift\_data” flag and if statement to choose if data should be shifted

shift\_flag = 1; %1 if the data should be shifted

What if we want to choose how much data is shifted? – input function

shift\_amount=input('how much should the data be shifted?');

CHALLENGE

* Add a flag called plot\_flag and an if statement, so that if the plot\_flag is 1, the script will plot and save your data
* EXTENSION: Add another flag called save\_flag and an if statement, so that if the save\_flag is 1 AND the data has been shifted, the script will save the shifted data to a csv (use the csvwrite function)