Name, Teammate’s name

Section X

## Week 0 Lab Report: Title

# Lab Report Rubric

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| --- | --- | --- |
| **Category** | **Student Score** | **Grader Score** |
| **Organization** | | |
| **Appropriate sections** | **1/1** | **/1** |
| **Appearance and formatting** | **2/2** | **/2** |
| **Spelling, grammar, sentence structure** | **1/1** | **/1** |
| **Work** | | |
| **Experimental procedure** | **2/2** | **/2** |
| **Results (data, code, figure, graph, tables, etc.)** | **1.5/2** | **/2** |
| **Conclusion** | **2/2** | **/2** |
|  |  |  |
| **Total** | **9.5/10** | **/10** |

# Introduction

This week we started working on loops both for matlab and arduino. We also learned about if/else statements and how to use these tools to solve problems and do challenges.

# Procedure

## State the Task/Problem/Question Attempted The task was to learn about for loops, if/else statements and learn to be able to apply them.

## Procedure

1. Observe and compare the use of ‘fprintf’ command here to the previous MATLAB lab. What does ‘%d’ do? What does ‘\n’ do? Try removing one at a time and observe the difference.

The ‘%d’ inserts the number into the text and ‘\n’ makes a new line

1. What does the script do?

It prints the numbers 1 to 5

1. Change the numbers in the first line to ‘1:1:10’. What does the script do?

It changes to printing 1 to 10

1. Change the numbers in the first line to ‘1:2:10’. What does the script do?

It changes to all the odd numbers from 1 to 10

1. Change the numbers in the first line to ‘-5:1:5’. What does the script do?

Displays the numbers from -5 to 5

1. Change the numbers in the first line to ‘1:5’. What does the script do? How is this different from the original script?

Challenge 1:

for i = 1:1:5 fprintf('hello world\n'); end

Challenge 2:

in order to make this program work you have to: store the value,

x = input("What number to count to? ");

sum = 0;

for i = 1:1:x

%sum++;

sum = sum +i;

end

fprintf('%d', sum);

IF STATEMENTS

The if statement checks the statement inside of it to be true. If the statement is true then it runs the code, otherwise it runs the else or the elseif statements.

1. Observe the output in the Command Window. Knowing that we have given the variable n a value of 5, is this result expected?

The value is what we would expect because the statement n== 5 is true (5==5)

1. Change the value of the variable n to 2. What is the output?

The output will say that it isn’t equal to five, because it isn’t.

1. What is the meaning of ‘==’ in line 2? Are there any other symbols commonly used in if-else statements? What do they stand for?

== is equal to

> is greater than (you can also do >=)

< is less than (you can also do <=)

! is not

1. Remove lines 4 and 5 from the script (do not delete the ‘end’ at the bottom). Try running the script with n = 5 followed by n = 2. Do you observe any difference from the original script?

There is no else condition so if the value isn’t five it returns nothing.

1. Can you now explain, in your own words, how does MATLAB process an if-else condition?

The if else condition works the same way that it works in C++ and almost every other programming language.

else if

1. Is the output what you expect? Explain your thought process.

I would expect either the “n is between 5 and 10”, “'n is smaller than 5”, and 'I do not recognize value of n'. These are the only conditions and

1. Change the value of the variable n to 4. What is the output? Is this output correct? Why?

The output is incorrect because it says it does not recognize the value. This is because it uses less than 4 rather than less than 5.

1. Change the value of the variable n to 3. What is the output? Is this output correct? Why?

The output is correct because

Challenge 3:

x = input("1-sum\n2-factorial\n3-power of two\n\n");

num = input("\n num is: ");

answer = 0;

if(x==1)%sumation

for i=1:1:num

answer = answer + i;

end

elseif(x==2)%factiorial

answer = 1; %forgot this

for i= 1:1:num

answer = answer \* num;

end

elseif(x==3)%power of two

answer = num^2;

end

fprintf('The answer is = %d\n', answer);

I forgot that it must be reset back to 0 and that the factorial would need answer to be 1 to start.

# Results

## Results

The loops and if statements work very similarly to how they work in other programming languages. Their function is the same but the syntax is different.

# Conclusions and Reflection

The programming in Matlab is very close to C/C++ but has different syntax and some functions don’t work. the carrot symbol works as a power sign though! I got stuck with using disp printing out an array of numbers for some reason so I switched over to fprintf.

## ***Include the questions, or ideas you had or areas where you got stuck and want to think more about. Discuss these with your lab mentors or teammates or others in the lab. Maybe some others might have the same kind of questions…***