Chapter 5 - Lecture 2

ENGR1120 - 800 - Honors Programming for Engineers

April 14, 2020

Different Types of Loops

Lecture 2 - Different Types of Loops

- Review and Motivation
- The While Loop
- The For Loop
- The Others

What is a Data File?

What is a Data File ?

- Standard way of organizing data for computer **storage**
- The data can represent many different things but it is all stored digitally
- Different file types are used for different purposes
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  -
  -

Why use Data Files?

Why use Data Files ?

- Organize large amounts of information
- Share large amounts of information
-

What is File IO?

What is File IO?

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-

File Input in a Program

File Input in a Program

- get data from a file during Program Execution
- data can be stored in a variable(s) to be used by your program

Comma Separated Values

The individual values in a file are often separated or *delimited* by a comma. Other characters are also used such as the space or *newline*.

.csv and MS Excel

.csv files are compatible with many different software systems

- MATLAB
- MS Excel
- ilearn

The fopen() Function

Open the file with the **fopen()** function

```
[FID]=fopen(FILENAME,PERMISSION)
```

- Input 1: FILENAME - the name of the file to open
- Input 2: PERMISSION - direction of access 'r' or 'w'
- Output 1: FID - the file identifier

The File Identifier

The **file identifier** (FID) gives important info

- If the file opens properly the FID will have a positive value
- The FID will have a negative value if there was an error
  - File is not in the proper directory
  - The current folder has not been set properly
  - Please organize you file structure!
- FID can also give information about the End Of File

The fscanf() Function

fscanf() can access the data only if the file is open

```
[A,COUNT]=fscanf(FID,FORMAT,SIZEA);
```

- Input 1: FID - the **file identifier** fid

  Input 2: FORMAT - format specification of the scan

  Input 3: SIZEA - number of values to be scanned

- Output 1: A - an array containing the scanned **data**

  Output 2: COUNT - the number of elements in **A**

The fclose() Function

Remember to close the file with **fclose()**

```
[ST]=fclose(FID)
```

- Input 1: FID - the **file identifier** fid
- Output 1: ST - status of close?

- Close the file after your program accesses the data
- THIS IS EASY TO FORGET BUT IMPORTANT!!!

A Simple Example

```
FID = fopen('input_data.csv','r');

A = fscanf(FID,'%f')

fclose(FID);
```

A More Complex Example

```
fid=fopen('lab9_degrees.csv','r');

i=1;
while ~feof(fid)
    data(i)=fscanf(fid,'%f,',1);
    i=i+1;
end

fclose(fid);
```

References

- Your MATLAB textbook - Chapter 5 - Looping Statements