Week 09: Formatting Output
Opening / Closing Files

Concepts for Today's Class:

formatted output
opening / closing files
these notes, worksheet, and demo script used in class are on web

Lab:

practicing formatted output, loops, logical indexing

New syntax:

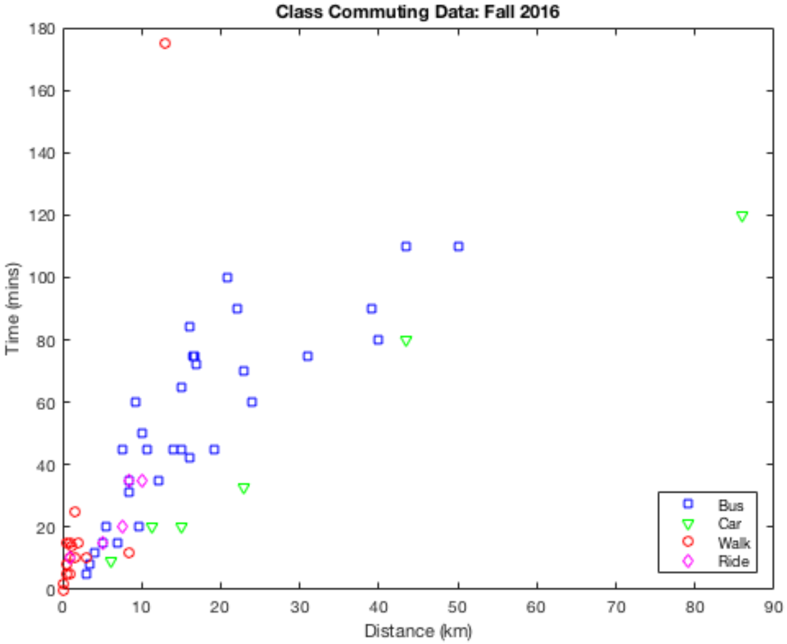
fprintf, sprintf (fscanf, sscanf), fopen, fclose, text
matlab help and doc are v. useful for above commands

Additional short reading resources for this week's material:

http://www.maths.unsw.edu.au/sites/default/files/MatlabSelfPaced/lesson7/MatlabLesson7_FormattedOutput.html
http://www.mathworks.com/help/matlab/matlab_prog/formatting-strings.html

The data from lab in week 2

…….. remember ……you turned in data about your "commute" to UBC
We will use this in the lab. The example below is using the data from 2016.



Mode	Number	Mins	km
----	------	-----------	---------------
Bus	17.6	55.1	34
Car	30.8	47.0	6
Walk	1.9	17.9	21
Bike	6.4	23.0	5

This year 81 people turned in lab

1 person reported "other" as transportation mode

often want to make figures "prettier" using information about the data: e.g.,

- by labeling some points with their x- y-values
- adding statistical info, e.g. median travel
- bigger labels

also might want to output some info to a file in easy-to-read format

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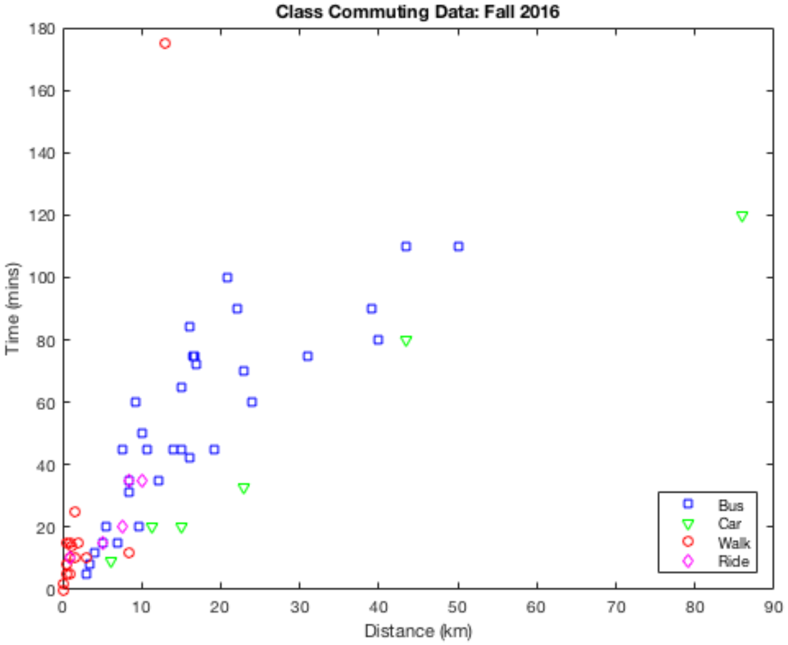

Mode	Number	Mins	km
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First…… logical indexing review - worksheet

Formatted output

We' ll use fprintf, sprintf

```
Mode      Number   Mins        km
----      ------   ----------- --------------
Bus       17.6     55.1        34
Car       30.8     47.0        6
Walk      1.9      17.9        21
Bike      6.4      23.0        5
```

fprintf - function to print strings to a file or screen

Usage: $\text{fprintf}(\underbrace{\text{fid, format, A}}_{\text{input arguments}})$

fid: file identifier, if this argument is absent or if fid=1 output will go to screen

format: string that can be a mix of characters and format specifiers

A: series of variables

Formatted output using fprintf

fprintf(fid, format, A)

fid: file identifier, if this argument is absent or if fid=1 output will go to screen

format: string that can be a mix of characters and format specifiers

A: series of variables

```
fprintf('Example of simply printing to the screen')
```

print to screen
no file identifier
or fid=1

print a text string

no variables

```
fprintf(1,'Example of simply printing to the screen')

fprintf(2,'Example of simply printing to the screen’)
```

fid=2 ➔ prints to standard error (the screen, but in red)

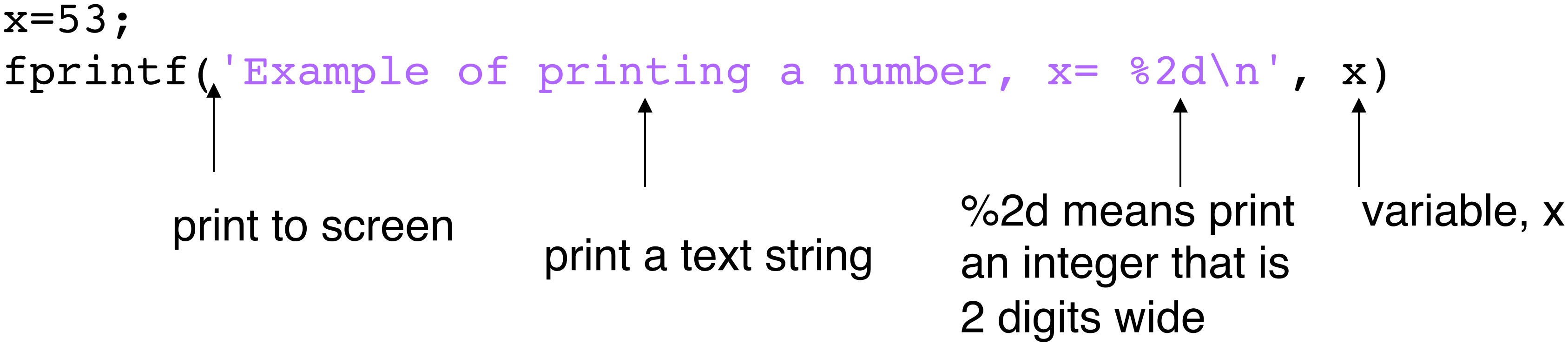
Formatted output using fprintf

fprintf(fid, format, A)

fid: file identifier, if this argument is absent output will go to screen

format: string that can be a mix of characters and format specifiers

A: series of variables



```
x=53;
fprintf('Example of printing a number, x= %2d\n', x)
```

print to screen

print a text string

%2d means print
an integer that is
2 digits wide

variable, x

%d is called a format specifier

We will mostly use %d, %f, %e, %g, %s

`See class examples in MATLAB`

`Format specifiers are vectorized - see part 2 of the lab today`

fprintf - print to a file, sprintf - print to a string
fopen and fclose

fprintf(fid, format, A)

Example:

```
fid=fopen('ClassExample.txt','w');
fprintf(fid,'Mode   Time    Distance \n');
fclose(fid);
```

sprintf(format, A)

- like fprintf but prints to a string
- can assign the output to a variable

```
See class examples in MATLAB
Try >> help fopen to see how to open files to read only
```