File Input and Output

Spring 2019

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- `load` function read data from a file.
- `save` function writes from a matrix to a data file.
- However, `load` will only work as long as the data has the same values on each line and these values are of the same data type, so that they can be stored in a matrix.
- If the file has different formats we need **lower level file Input/Output** functions.

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- `fid = fopen('filename','permission string')`
- **permission strings** include:
  1. `r` read (default)
  2. `w` write
  3. `a` append
- `>>help fopen` for other permissions

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- Use `fclose` to close the file after finishing reading, writing or appending them.
- `fclose` returns `0` if the file close was successful, or `-1` if not.
- One must also check that the file has been closed properly at the end of the program.

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Exercise

Download the provided `emissions.txt` file and save it in your current directory. Write a script that performs the following tasks

1. Open the file
2. Check to make sure that the file has been open successfully or otherwise and print out the appropriate message
3. Close the file and check to make sure that the file has been closed successfully.

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- `fprintf` returns the number of bytes that was written to the file

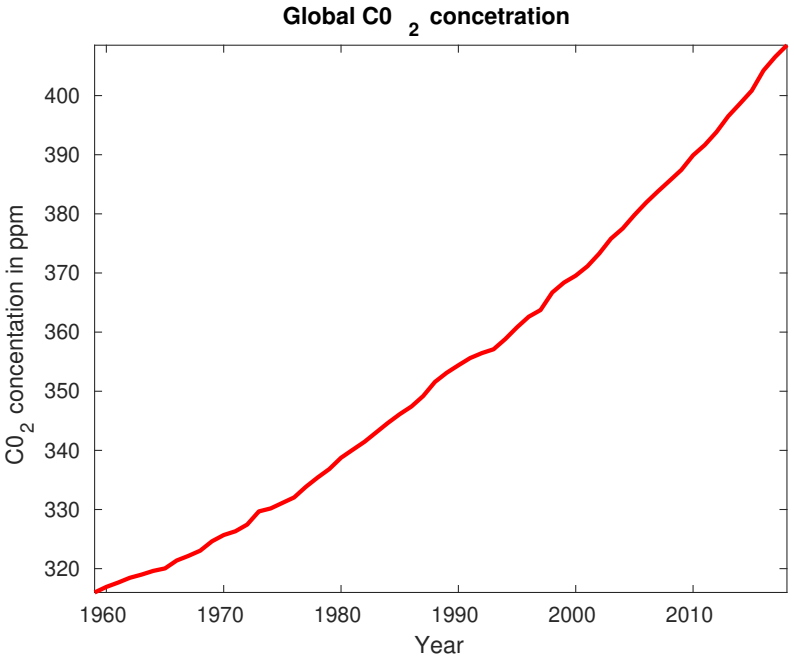
Exercise

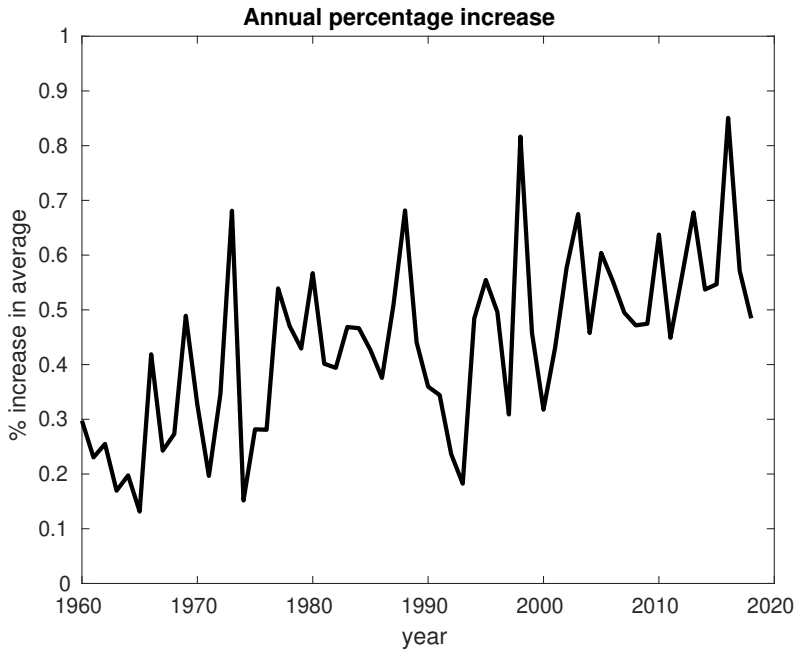
Visualizing the trend of concentration of $C0_2$ in the atmosphere over time

The file `emissions.txt` (downloaded from NOAA) contains the average $C0_2$ concentration per year.

1. Use `fscanf` to read the data in the file `emissions.txt`
2. Use the data to plot the growth of concentration of $C0_2$ over time
3. Use the data to plot the annual percentage increase in $C0_2$ concentration over time.
4. Save the annual percentage increase values in a file.

Exercise


Global C0 2 concetration
C0 2 concentation in ppm
400
390
380
370
360
350
340
330
320
1960
1970
1980
1990
2000
2010
Year


Annual percentage increase
% increase in average
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1960
1970
1980
1990
2000
2010
2020
year