Lesson 18

Reading and Writing Files . Recursion 2

Lesson Objectives

- Open txt file
- Read write file with different mode
- CSV file
- treat CSV file as txt file
- process CSV file

File Handling

The key function for working with files in Python is the `open()` function.

The `open()` function takes two parameters; *filename*, and *mode*.

There are four different methods (modes) for opening a file:

`"r"` - Read - Default value. Opens a file for reading, error if the file does not exist

`"a"` - Append - Opens a file for appending, creates the file if it does not exist

`"w"` - Write - Opens a file for writing, creates the file if it does not exist

`"x"` - Create - Creates the specified file, returns an error if the file exists

Read Only Parts of the File

By default the `read()` method returns the whole text, but you can also specify how many characters you want to return:

Read Lines

You can return one line by using the `readline()` method:

By looping through the lines of the file, you can read the whole file, line by line:

Example

Loop through the file line by line:

```
f = open("demofile.txt", "r")
for x in f:
  print(x)
```

Close Files

It is a good practice to always close the file when you are done with it.

Example

Close the file when you are finish with it:

```
f = open("demofile.txt", "r")
print(f.readline())
f.close()
```

Write to an Existing File

To write to an existing file, you must add a parameter to the `open()` function:

`"a"` - Append - will append to the end of the file

`"w"` - Write - will overwrite any existing content

Create a New File

To create a new file in Python, use the `open()` method, with one of the following parameters:

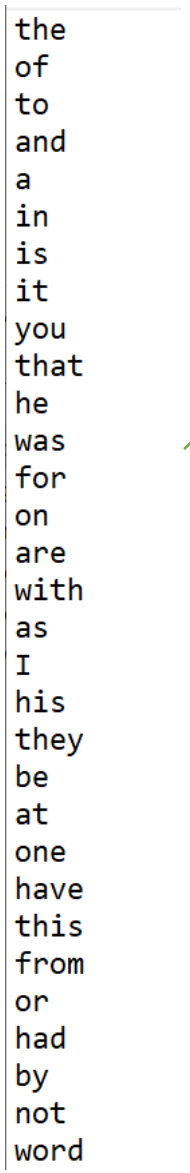
`"x"` - Create - will create a file, returns an error if the file exist

`"a"` - Append - will create a file if the specified file does not exist

`"w"` - Write - will create a file if the specified file does not exist

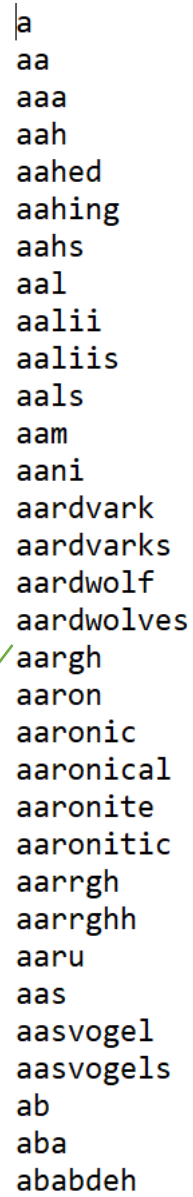
Live demo

open . read files



Common word list
(1000 words)

Extensive word list
(more than 370 000 words)



```
words = open('common words.txt','r')

word_list = []
for word in words:
    word_list.append(word[:-1])

words.close()
```

	A	B	C	D	E	F	G	H	I	J	K	L
1	year	university	school	degree	employme	employme	basic_mor	basic_mor	gross_moi	gross_moi	gross_mth	gross_mthly_75_percentile
2	2013	Nanyang T	College of	Accountar	97.4	96.1	3701	3200	3727	3350	2900	4000
3	2013	Nanyang T	College of	Accountar	97.1	95.7	2850	2700	2938	2700	2700	2900
4	2013	Nanyang T	College of	Business (	90.9	85.7	3053	3000	3214	3000	2700	3500
5	2013	Nanyang T	College of	Business a	87.5	87.5	3557	3400	3615	3400	3000	4100
6	2013	Nanyang T	College of	Aerospace	95.3	95.3	3494	3500	3536	3500	3100	3816
7	2013	Nanyang T	College of	Bioengine	81.3	68.8	2952	2900	3166	3125	2893	3365
8	2013	Nanyang T	College of	Chemical a	87.3	85.1	3235	3000	3377	3200	3000	3800
9	2013	Nanyang T	College of	Computer	90.3	88.2	3326	3100	3374	3175	3000	3600
10	2013	Nanyang T	College of	Civil Engin	94.8	93.8	3091	3000	3182	3100	3000	3380
11	2013	Nanyang T	College of	Computer	92.1	88.5	3249	3000	3306	3125	3000	3600
12	2013	Nanyang T	College of	Electrical a	91	88.7	3133	3000	3187	3100	3000	3440
13	2013	Nanyang T	College of	Environme	84	81.5	3091	3000	3140	3000	3000	3300
14	2013	Nanyang T	College of	Informatic	85.7	79.6	3160	3150	3203	3200	2950	3400
15	2013	Nanyang T	College of	Materials	82.5	78.9	2989	3000	3096	3000	2800	3300
16	2013	Nanyang T	College of	Mechanica	91.6	89.5	3125	3000	3226	3100	3000	3500
17	2013	Nanyang T	College of	Maritime S	95.6	93.3	3050	3000	3111	3000	2850	3200
18	2013	Nanyang T	College of	Art, Desigr	81.6	61.4	2639	2500	2638	2500	2300	2900
19	2013	Nanyang T	College of	Chinese	85.1	80.5	2818	2800	2924	3000	2600	3300

```
year,university,school,degree,employment_rate_overall,employment_rate_ft_perm,basic_monthly_mean,basic_monthly_median,gross_monthly_mean,gross_monthly_median,gross_mthly_25_percentile,gross_mthly_75_percentile
2013,Nanyang Technological University,College of Business (Nanyang Business School),Accountancy and Business,97.4,96.1,3701,3200,3727,3350,2900,4000
2013,Nanyang Technological University,College of Business (Nanyang Business School),Accountancy (3-yr direct Honours Programme),97.1,95.7,2850,2700,2938,2700,2700,2900
2013,Nanyang Technological University,College of Business (Nanyang Business School),Business (3-yr direct Honours Programme),90.9,85.7,3053,3000,3214,3000,2700,3500
2013,Nanyang Technological University,College of Business (Nanyang Business School),Business and Computing,87.5,87.5,3557,3400,3615,3400,3000,4100
2013,Nanyang Technological University,College of Engineering,Aerospace Engineering,95.3,95.3,3494,3500,3536,3500,3100,3816
2013,Nanyang Technological University,College of Engineering,Bioengineering,81.3,68.8,2952,2900,3166,3125,2893,3365
2013,Nanyang Technological University,College of Engineering,Chemical and Biomolecular Engineering,87.3,85.1,3235,3000,3377,3200,3000,3800
2013,Nanyang Technological University,College of Engineering,Computer Engineering,90.3,88.2,3326,3100,3374,3175,3000,3600
2013,Nanyang Technological University,College of Engineering,Civil Engineering,94.8,93.8,3091,3000,3182,3100,3000,3380
2013,Nanyang Technological University,College of Engineering,Computer Science,92.1,88.5,3249,3000,3306,3125,3000,3600
2013,Nanyang Technological University,College of Engineering,Electrical and Electronic Engineering,91,88.7,3133,3000,3187,3100,3000,3440
2013,Nanyang Technological University,College of Engineering,Environmental Engineering,84,81.5,3091,3000,3140,3000,3000,3300
2013,Nanyang Technological University,College of Engineering,Information Engineering and Media,85.7,79.6,3160,3150,3203,3200,2950,3400
2013,Nanyang Technological University,College of Engineering,Materials Engineering,82.5,78.9,2989,3000,3096,3000,2800,3300
2013,Nanyang Technological University,College of Engineering,Mechanical Engineering,91.6,89.5,3125,3000,3226,3100,3000,3500
2013,Nanyang Technological University,College of Engineering,Maritime Studies,95.6,93.3,3050,3000,3111,3000,2850,3200
2013,Nanyang Technological University,"College of Humanities, Arts & Social Sciences","Art, Design & Media",81.6,61.4,2639,2500,2638,2500,2300,2900
2013,Nanyang Technological University,"College of Humanities, Arts & Social Sciences",Chinese,85.1,80.5,2818,2800,2924,3000,2600,3300
2013,Nanyang Technological University,"College of Humanities, Arts & Social Sciences",Communication Studies,89.4,79.6,2893,2930,2956,3000,2700,3250
2013,Nanyang Technological University,"College of Humanities, Arts & Social Sciences",Economics,89.9,83.5,3085,3000,3148,3000,2800,3545
2013,Nanyang Technological University,"College of Humanities, Arts & Social Sciences",English,82.7,67.3,3087,3000,3179,3100,2800,3400
2013,Nanyang Technological University,"College of Humanities, Arts & Social Sciences",Linguistics and Multilingual Studies,90.6,81.3,2691,2600,2725,2625,2475,3018
```

```
file = open('graduate.csv','r')

file_list = []
for line in file:
    line = line[:-1] #removing the last character \n
    file_list.append(line.split(','))

file.close()
```

```
maximum = 0

list_wo_header = file_list[1:]  #remove header
for line in list_wo_header:
    if line[11] == 'na':
        continue
    elif int(line[11]) > maximum:
        maximum = int(line[11])

print(maximum)
```

Sample Data File

Name
...
common words.txt
graduate.csv
harry potter.txt
wage2019.csv
words.txt

Our World in Data

Articles by topic

Search...

Lates

All charts Sustainable Development Goals Tracker

Coronavirus › By country Data ex

Coronavirus Pandemic

Data Explorer

Download the complete *Our World in Data* COVID-19 dataset.

Type to add a country...

Sort by Country name

- Algeria
- Australia

- Health
- Demographic Change
- Food and Agriculture
- Education and Knowledge
- Energy and Environment
- Innovation and Technological Change
- Poverty and Economic Development
- Living conditions, Community and Wellbeing
- Human rights and Democracy

- Hunger and Undernourishment
- Famines
- Food Supply
- Human Height
- Micronutrient Deficiency
- Diet Compositions
- Food Prices
- Obesity
- Alcohol Consumption
- Agricultural Production

Pesticides

Getting your hands dirty . . .

- with a list of data, you can further process and analyze the data:
  - creating a dictionary : word list
  - searching for the alphabet that have the most words
  - creating a dictionary : each alphabet : number of occurrence (start or total)
  - which course pays the best (function or program)
  - which course pays the least (function or program)
  - which course gives the best job security (function or program)
  - True / False : course with the high upside, have greater risk
  - given different scenario: possible solution
  - jobs within salary range

Work to do . . .

- play around with the txt and csv file
- 15 - Recursion
- Programming Assignment 15