Scientific Computing with Python Lab

10th Session(April 2nd)

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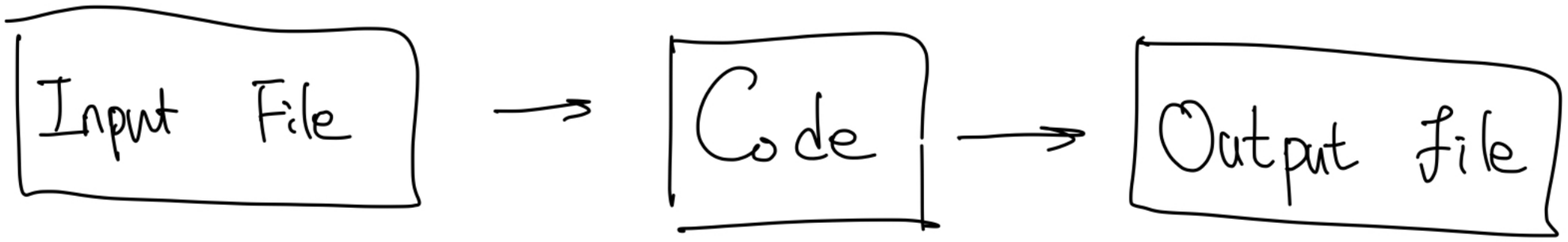
Today

we are going to talk about

- Recap things we did last week : open/write files



- Figure out the homework problem and the structure of txt file
- Extra techniques for doing your homework

Before we start

Basically

- Clarify your directory

  - Make the directory to download file and make a python script

  - Stick to the folder for your tasks(based on the homework/

    problem)

- Also, for your homework, don’t do the all task in one folder(Download, Desktop, Document, …)

Read Files

- Code

  with open(“file_name.txt”, **“r”**) as input_file:

  ———————operation ———————-

- Parameters

  - file_name.txt : name of the input file, you downloaded

  - “r” : read the input file

  - input_file : store the information in to the variable named “input_file”

Split the lines

- Code

```
with open("file_name.txt", "r") as input_file:
                                                    Read a single line
        lines = input_file.readline()
with open("file_name.txt", "r") as input_file:
                                                    Read whole lines left
        lines = input_file.readlines()
```

- readlines : split the txt file based on the spacing in the list named "input_file"

Practice

```
1;2;3
4;5;10
11;13;28
```

Result

```
In [2]: lines
Out[2]: ['1;2;3\n', '4;5;10\n', '11;13;28']
```

Split the string

- Code

  string.strip().split(‘splitting_standard’)

- split_standard : things located between numbers

  ex. “1,2,3” → split_standard : “,”

Practice

```
string = '1,2,3\n'
```

```
splited_string
['1', '2', '3']
```

Result

list operation

- Code

```
modified_list = [operation(x) for x in list_]
```

```
string = '1,2,3\n'
```

Practice

```
In [23]: splited_string_int
Out[23]: [1, 2, 3]
```

Practice

Process it into matrix

Result

```
1;2;3
4;5;10
11;13;28
```

```
In [48]: matrix1
Out[48]: [[1, 2, 3], [4, 5, 10], [11, 13, 28]]
```

list operation

- Code

```
modified_list = [operation(x) for x in list_]
```

- Code for Matrix Calculation

Practice (Matrix Calculation)

Writing Files

- Code

  with open(“file_name.txt”, **“w”**) as output_file:

  ———————operation ———————-

- Parameters

  - file_name.txt : name of the output file, you want to form

  - “w” : write the new output file

  - output_file : the txt file we are going to write onto

Write files

- Start with blank txt file

  output_file.write(“something_you_want_to_write”)

- Writing option : “something_you_want_to_write”

  If you want to write integer/float stored in some variables,

  → Same as print option : fstring

Practice

Find the mean of each row of **the input file**

Alphabetical Order

Problem3

- There is a number assigned to the each character : ord

a ~ z -> 97 ~ 122, A ~ Z -> 65 ~ 90

- You can call the character based on the order: chr

97 ~ 122 -> a~z, 65 ~ 90 -> A ~ Z

- Converting to lower/upper case :

‘str’.lower() / ‘str’.upper()

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Problem3

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Reversing the list and set

Problem5 and Problem6

- reversing the list : a[::-1]
- set : no repeating

1. start with set, a = set(), add the element by using add function
2. After appending to the list a, switch into the set set(a)