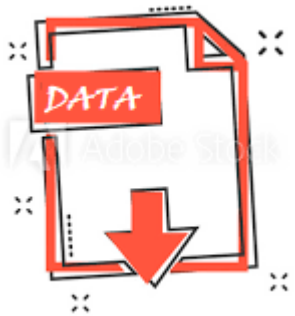
File Input/Output

File IO in Python

Often you want to put calculated or generated data in a file so that the results are still available later.

Or, you may already have a file with data that you want to analyze.



In Python, storing data in files and reading date from files is very easy.

Write a list of numbers to a file

Write a list of numbers to a file

```
liste = [3, 4, 3.5, 'a']
path="text.txt"
with open(path, 'w') as file:
    for n in range(0, len(liste)):
        elem = liste[n]
        file.write(str(elem)+"\n" )
```

Open file under the path in *write* mode

Convert elem to text -> only texts can be written to files ,
end each line with “\n” -> new line

The file is automatically closed at the end

File content

```
3
4
3.5
a
```

Write some text into a file

Write personal data to a file

```
personList = [
    ['54', 'Urs', 'Muster', 'Bahnhofstr. 6', ' Bern'],
    ['57', 'Hans', 'Muster', 'Hauptstr. 3', ' Bern'],
    ['60', 'Anna', 'Muster', 'Hauptstr. 7', ' Bern'],
    ['65', 'Ida', 'Muster', 'Bahnhofstr. 5', ' Bern'],
    ['74', 'Karin', 'Muster', 'Hauptstr. 1', ' Bern'] ]

path = "people.txt"
for elem in personList:
    with open(path, 'a') as writer:
        line = elem[0] + ";" + elem[1] + ";" + elem[2] + ";" + elem[3] \
            + ";" + elem[4] + "\n"
        writer.write(line)
```

Open the file under the path in *append* mode
Separate individual items by ";"
End each line with a *newline* -> "\n“
Append line to the file

The content of the person.txt file:

```
1  54;Urs;Muster;Bahnhofstr. 6; Bern
2  57;Hans;Muster;Hauptstr. 3; Bern
3  60;Anna;Muster;Hauptstr. 7; Bern
4  65;Ida;Muster;Bahnhofstr. 5; Bern
5  74;Karin;Muster;Hauptstr. 1; Bern
```

Read numbers from a file

```
with open(path, 'r') as reader:
    numbers = list()
    for line in reader:
        try:
            numbers.append(float(line))
        except:
            pass
print(numbers)
```

Open File for reading
Read line by line

Convert read lines in numbers (if possible).
Ignore exceptions

Print list of read numbers

File content

```
1  3
2  4
3  3.5
4  a
5  -5
6  7.0
7
```

Output

```
[3.0, 4.0, 3.5, -5.0, 7.0]
```

Read text from a file

```
fileContent = list()
path = "people.txt"
with open (path, 'r') as reader:
    for line in reader:
        try:
            line = line.rstrip() #remove \n
            words = line.split(";") #split into words
            fileContent.append(words)
        except:
            pass
for elem in fileContent:
    print(elem)
```

Open file at path for reading

Remove newline with rstrip

Words are separated by ";"
Append words to list.

File content

```
1  54;Urs;Muster;Bahnhofstr. 6; Bern
2  57;Hans;Muster;Hauptstr. 3; Bern
3  60;Anna;Muster;Hauptstr. 7; Bern
4  63;Peter;Muster;Hauptstr. 8; Bern
5  65;Ida;Muster;Bahnhofstr. 5; Bern
6  74;Karin;Muster;Hauptstr. 1; Bern
```

people.txt

Output

```
['54', 'Urs', 'Muster', 'Bahnhofstr. 6', ' Bern']
['57', 'Hans', 'Muster', 'Hauptstr. 3', ' Bern']
['60', 'Anna', 'Muster', 'Hauptstr. 7', ' Bern']
['63', 'Peter', 'Muster', 'Hauptstr. 8', ' Bern']
['65', 'Ida', 'Muster', 'Bahnhofstr. 5', ' Bern']
['74', 'Karin', 'Muster', 'Hauptstr. 1', ' Bern']
```

print fileContent

Append to an existing file with ‘a’

```
liste = ['a','b','c','d']

path = "test.txt"
with open(path,'a') as file:
    for ele in liste:
        file.write(ele+"\n")
```

Open file for appending

Initial file content

```
1
2
3
4
5
```

File content after appending

```
1
2
3
4
5
a
b
c
d
```