Data Academy

Data Science

Python

Module 1 – session 3

TECH TALENT ACADEMY

Session Content

1+2 DIMENSIONAL LISTS

STRING HANDLING

FILE HANDLING

TTA

Lists

0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8

```
[ ]: my_1d_list = [1,2,3,4,5,6,7,8]
     print (my_1d_list)
```

Python is zero indexed

```
[3]: for i in range(len(my_1d_list)):
         print("My list at value", i, "is:", my_1d_list[i])
```

```
My list at value 0 is: 1
My list at value 1 is: 2
My list at value 2 is: 3
My list at value 3 is: 4
My list at value 4 is: 5
My list at value 5 is: 6
My list at value 6 is: 7
My list at value 7 is: 8
```

TTA

Handling 1D Lists

0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8

```
1dlist = [1,2,3,4,5,6,7,8]
print (1dlist[2])
```

```
My list at value 2 is: 3
```

print (len(1dlist))

```
print(len(my_1d_list))
```

print (1dlist[2:5])

```
[3, 4, 5]
```

TTA

Handling 2D Lists

2-Dimensional Lists are lists within a list

This is done by putting [] within [] and separating by ,

```
my_2d_list = [[1,2,3,4],
              [5,6,7,8],
              [9,10,11,12]
             ]
```

They are referenced as row then column.

2dlist[0] will show you the content of the row

```
[1, 2, 3, 4]
```

2dlist[0][3] will show you the first row, and 4th column/value

```
My list at row 0 and column 3 is: 4
```

TTA

String Handling

E	x	a	m	p	l	e	s
0	1	2	3	4	5	6	7

```
[6]: text = ("example")
     print(text[2])
```

```
a
```

```
[7]: print(text[2:5])
```

```
amp
```

```
[4]: print(len(text))
```

```
7
```

```
[5]: for each_char in range(len(text)):
         print("My character at value", each_char, "is:", text[each_char])
```

```
My character at value 0 is: e
My character at value 1 is: x
My character at value 2 is: a
My character at value 3 is: m
My character at value 4 is: p
My character at value 5 is: l
My character at value 6 is: e
```

TTA

Storing Data

When a program is run the data is stored in memory, unless it is held in permanent storage it will be lost.

FLAT FILES

Simple text files myfile.txt

Use notepad to open them up (note that both the text and python files need to be in the same folder)

TTA

File Handling

To create a .txt file we use open()

my_file = open("my_new_text_file.txt", “w")
This will create a text file called “my_new_text_file”.

If the file already exists it will overwrite the data!

File modes:
w = Writes new data to a file
r = Reads from a file
a = Append data to the end of the file

TTA

Writing to a file

File handle

Open a file to Write

```
my_file = open("my_new_text_file.txt", “w")
for i in range(10):
    my_file.write(str(i))
    my_file.write("\n")

my_file.close()
```

New line operator

Files must be closed

TTA

Reading from a file

```
with open ("my_new_text_file.txt", "r") as myfile:
    data = myfile.read().replace('\n', ',')

myfile.close()
```

```
print(data)
```

```
0,1,2,3,4,5,6,7,8,9,
```

TTA

Appending to a file

[ ]:
```
# Appending
my_file = open("my_new_text_file.txt", "a")

my_file.write("Where has it gone?")

my_file.close()

# Note: re-run previous cell to see where the data has gone in the txt file.
```

TTA

Home Learning Tasks

Task 1

Write a program that allows you to enter 4 numbers and stores them in a file called “Numbers”

- **3**
- **45**
- **83**
- **21**

Have a go at ‘w’ ‘r’ ‘a’

TTA

Task 2

Write a program to ask a student for their percentage mark and convert this to a grade.

The conversion will be done in a function called mark_grade

TTA

Extension to Task 2

- Ask the user for their target grade and print this with their mark
- If their target grade > exam grade display a suitable message
- If their target grade = exam grade display a suitable message
- If their target grade < exam grade display a suitable message

TTA


TECH TALENT
ACADEMY