# Basic Python

## 1. Split this string

```
s = "Hi there Sam!"
```

```
s.split()
```

```
['Hi', 'there', 'Sam!']
```

## 2. Use .format() to print the following string.

Output should be: The diameter of Earth is 12742 kilometers.

```
planet = "Earth"
diameter = 12742
```

```
'The diameter of {0} is {1} kilometers'.format(planet,diameter)
```

```
'The diameter of Earth is 12742 kilometers'
```

## 3. In this nest dictionary grab the word "hello"

```
d = {'k1':[1,2,3,{'tricky':['oh','man','inception',{'target':[1,2,3,'hello']}]}]}
```

```
print(d["k1"][3]["tricky"][3]["target"][3])
```

```
hello
```

# Numpy

```
import numpy as np
```

## 4.1 Create an array of 10 zeros?

## 4.2 Create an array of 10 fives?

```
arr1 = np.zeros(10)
print(arr1)
```

```
[0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
```

```
arr2 = np.ones(10)*5
print(arr2)
```

```
[5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
```

## 5. Create an array of all the even integers from 20 to 35

```
arr3 = np.arange(20,36,2)
print(arr3)
```

```
[20 22 24 26 28 30 32 34]
```

## 6. Create a 3x3 matrix with values ranging from 0 to 8

```
x =  np.arange(0, 9).reshape(3,3)
print(x)
```

```
[[0 1 2]
 [3 4 5]
 [6 7 8]]
```

## 7. Concatenate a and b

## a = np.array([1, 2, 3]), b = np.array([4, 5, 6])

```
a = np.array([1, 2, 3])
b = np.array([4, 5, 6])
#Concatenate
np.concatenate((a,b),axis=None)
```

```
array([1, 2, 3, 4, 5, 6])
```

# Pandas

## 8. Create a dataframe with 3 rows and 2 columns

```
import pandas as pd



A = np.random.randint(10, size=(3,2))
#dataframe
df = pd.DataFrame(A,columns=['cola', 'colb'])
df
```

| | cola | colb |
|---|---|---|
| **0** | 0 | 1 |
| **1** | 5 | 2 |
| **2** | 8 | 2 |

## 9. Generate the series of dates from 1st Jan, 2023 to 10th Feb, 2023

```
import pandas as pd

# calling DataFrame constructor
df = pd.DataFrame()

# Create 6 dates
df['time'] = pd.date_range(start="1/1/2023",end="2/10/2023", freq ='24H')
  # print dataframe

# Extract features - year, month, day, hour, and minute
df['year'] = df['time'].dt.year
df['month'] = df['time'].dt.month
df['day'] = df['time'].dt.day


# Show six rows
df.head(len(df["time"]))
```

| | time | year | month | day |
|---|---|---|---|---|
| **0** | 2023-01-01 | 2023 | 1 | 1 |
| **1** | 2023-01-02 | 2023 | 1 | 2 |
| **2** | 2023-01-03 | 2023 | 1 | 3 |
| **3** | 2023-01-04 | 2023 | 1 | 4 |
| **4** | 2023-01-05 | 2023 | 1 | 5 |
| **5** | 2023-01-06 | 2023 | 1 | 6 |
| **6** | 2023-01-07 | 2023 | 1 | 7 |
| **7** | 2023-01-08 | 2023 | 1 | 8 |
| **8** | 2023-01-09 | 2023 | 1 | 9 |
| **9** | 2023-01-10 | 2023 | 1 | 10 |
| **10** | 2023-01-11 | 2023 | 1 | 11 |
| **11** | 2023-01-12 | 2023 | 1 | 12 |
| **12** | 2023-01-13 | 2023 | 1 | 13 |
| **13** | 2023-01-14 | 2023 | 1 | 14 |
| **14** | 2023-01-15 | 2023 | 1 | 15 |
| **15** | 2023-01-16 | 2023 | 1 | 16 |
| **16** | 2023-01-17 | 2023 | 1 | 17 |
| **17** | 2023-01-18 | 2023 | 1 | 18 |
| **18** | 2023-01-19 | 2023 | 1 | 19 |
| **19** | 2023-01-20 | 2023 | 1 | 20 |
| **20** | 2023-01-21 | 2023 | 1 | 21 |
| **21** | 2023-01-22 | 2023 | 1 | 22 |
| **22** | 2023-01-23 | 2023 | 1 | 23 |
| **23** | 2023-01-24 | 2023 | 1 | 24 |

## 10. Create 2D list to DataFrame

lists = [[1, 'aaa', 22], [2, 'bbb', 25], [3, 'ccc', 24]]

```
lists = [[1, 'aaa', 22], [2, 'bbb', 25], [3, 'ccc', 24]]
```

| | | | | |
|---|---|---|---|---|
| **28** | 2023-01-29 | 2023 | 1 | 29 |

```
#2D list to DataFrame
df = pd.DataFrame(lists, columns =['col1',"col2","col3"])
df
```

| | col1 | col2 | col3 |
|---|---|---|---|
| **0** | 1 | aaa | 22 |
| **1** | 2 | bbb | 25 |