Chapter 5 - Dimensionality Reduction Methods

Segment 1 - Explanatory factor analysis

```
import pandas as pd
import numpy as np

import sklearn
from sklearn.decomposition import FactorAnalysis

from sklearn import datasets
```

Factor analysis on iris dataset

```
iris =  datasets.load_iris()

X = iris.data
variable_names = iris.feature_names

X[0:10,]
```

```
     array([[5.1, 3.5, 1.4, 0.2],
            [4.9, 3. , 1.4, 0.2],
            [4.7, 3.2, 1.3, 0.2],
            [4.6, 3.1, 1.5, 0.2],
            [5. , 3.6, 1.4, 0.2],
            [5.4, 3.9, 1.7, 0.4],
            [4.6, 3.4, 1.4, 0.3],
            [5. , 3.4, 1.5, 0.2],
            [4.4, 2.9, 1.4, 0.2],
            [4.9, 3.1, 1.5, 0.1]])
```

```
factor = FactorAnalysis().fit(X)

DF = pd.DataFrame(factor.components_, columns=variable_names)
print(DF)
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	0.706989	-0.158005	1.654236	0.70085
1	0.115161	0.159635	-0.044321	-0.01403
2	-0.000000	0.000000	0.000000	0.00000
3	-0.000000	0.000000	0.000000	-0.00000