Exercise 3

In [1]:

```python
import numpy as np
import pandas as pd
```

1) Create Two numpy array of size 3 X 2 and 2 X 3

2) Randomly Initalize that array

In [7]:

```python
A = np.random.rand(3,2)
B = np.random.rand(2,3)
print("A :")
print(A)
print("B :")
print(B)
```

```
A :
[[0.84162713 0.31657566]
 [0.6556288  0.95953026]
 [0.18124857 0.74387258]]
B :
[[0.96893742 0.57178345 0.78592429]
 [0.8625276  0.83244311 0.66631427]]
```

3) Perform matrix multiplication

In [8]:

```python
C = A.dot(B)
print(C)
```

```
[[1.08853927 0.74475969 0.87239409]
 [1.46288461 1.17363205 1.15462331]
 [0.81722916 0.72286654 0.63810057]]
```

4) Perform elementwise matrix multiplication

In [9]:

```python
D = A*B.transpose()
print(D)
```

```
[[0.81548402 0.27305524]
 [0.37487769 0.79875436]
 [0.14244766 0.49565292]]
```

5) Find mean of first matrix

In [10]:

```
A.mean()
```

Out[10]:

0.6164138346188658

6) Convert Numeric entries(columns) of mtcars.csv to Mean Centered Version

In [12]:

```
datasets = pd.read_csv('/home/nihar/Downloads/mtcars.csv')
datasets.head()
```

Out[12]:

	model	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
0	Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
1	Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
2	Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
3	Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
4	Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2

In [14]:

```
datasets['mpg'] = datasets['mpg'].apply(lambda x : x-datasets['mpg'].mean())
datasets['cyl'] = datasets['cyl'].apply(lambda x : x-datasets['cyl'].mean())
datasets['disp'] = datasets['disp'].apply(lambda x : x-datasets['disp'].mean())
datasets['hp'] = datasets['hp'].apply(lambda x : x-datasets['hp'].mean())
datasets['drat'] = datasets['drat'].apply(lambda x : x-datasets['drat'].mean())
datasets['wt'] = datasets['wt'].apply(lambda x : x-datasets['wt'].mean())
datasets['qsec'] = datasets['qsec'].apply(lambda x : x-datasets['qsec'].mean())
datasets['vs'] = datasets['vs'].apply(lambda x : x-datasets['vs'].mean())
datasets['am'] = datasets['am'].apply(lambda x : x-datasets['am'].mean())
datasets['gear'] = datasets['gear'].apply(lambda x : x-datasets['gear'].mean())
datasets['carb'] = datasets['carb'].apply(lambda x : x-datasets['carb'].mean())
datasets.head()
```

Out[14]:

	model	mpg	cyl	disp	hp	drat	wt	qsec	vs
0	Mazda RX4	0.909375	-0.1875	-70.721875	-36.6875	0.303437	-0.59725	-1.38875	-0.4375
1	Mazda RX4 Wag	0.909375	-0.1875	-70.721875	-36.6875	0.303437	-0.34225	-0.82875	-0.4375
2	Datsun 710	2.709375	-2.1875	-122.721875	-53.6875	0.253438	-0.89725	0.76125	0.5625
3	Hornet 4 Drive	1.309375	-0.1875	27.278125	-36.6875	-0.516562	-0.00225	1.59125	0.5625
4	Hornet Sportabout	-1.390625	1.8125	129.278125	28.3125	-0.446563	0.22275	-0.82875	-0.4375