

**Aim : Matrix Multiplication using MapReduce.**

Step 1 : Open terminal > Create two text files of matrix m1.txt and m2.txt.

```
[cloudera@quickstart ~]$ cd ~/Desktop  
[cloudera@quickstart Desktop]$ mkdir matrix_mul  
[cloudera@quickstart Desktop]$ cd matrix_mul  
[cloudera@quickstart matrix_mul]$ gedit m1.txt
```

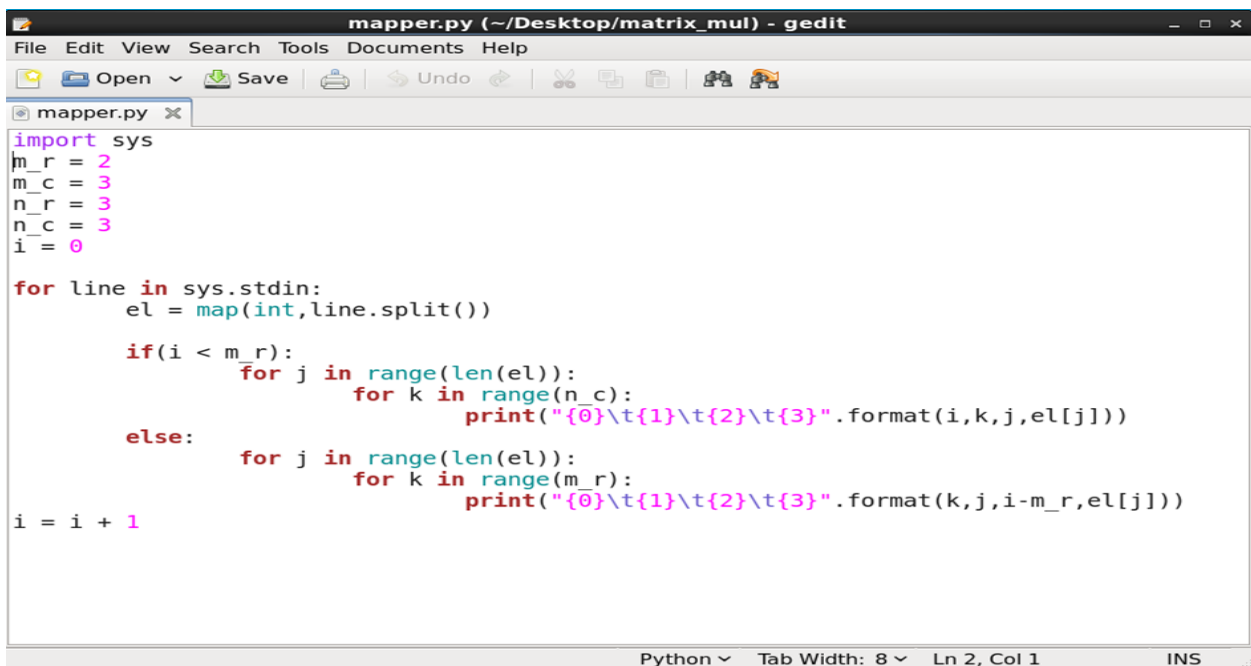
```
m1  
1 2 3  
4 5 6
```

```
[cloudera@quickstart matrix_mul]$ gedit m2.txt
```

```
m2  
4 5 6  
7 8 9  
1 2 6
```

Step 2 : Create Mapper file mapper.py

```
[cloudera@quickstart matrix_mul]$ gedit mapper.py
```



```
mapper.py (~/Desktop/matrix_mul) - gedit  
File Edit View Search Tools Documents Help  
Open Save Undo  
mapper.py  
import sys  
m_r = 2  
m_c = 3  
n_r = 3  
n_c = 3  
i = 0  
  
for line in sys.stdin:  
    el = map(int, line.split())  
    if(i < m_r):  
        for j in range(len(el)):  
            for k in range(n_c):  
                print("{0}\t{1}\t{2}\t{3}".format(i, k, j, el[j]))  
    else:  
        for j in range(len(el)):  
            for k in range(m_r):  
                print("{0}\t{1}\t{2}\t{3}".format(k, j, i-m_r, el[j]))  
i = i + 1  
  
Python Tab Width: 8 Ln 2, Col 1 INS
```

```
[cloudera@quickstart matrix_mul]$ cat m1.txt m2.txt | python
```

**mapper.py Mapper Output :**

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

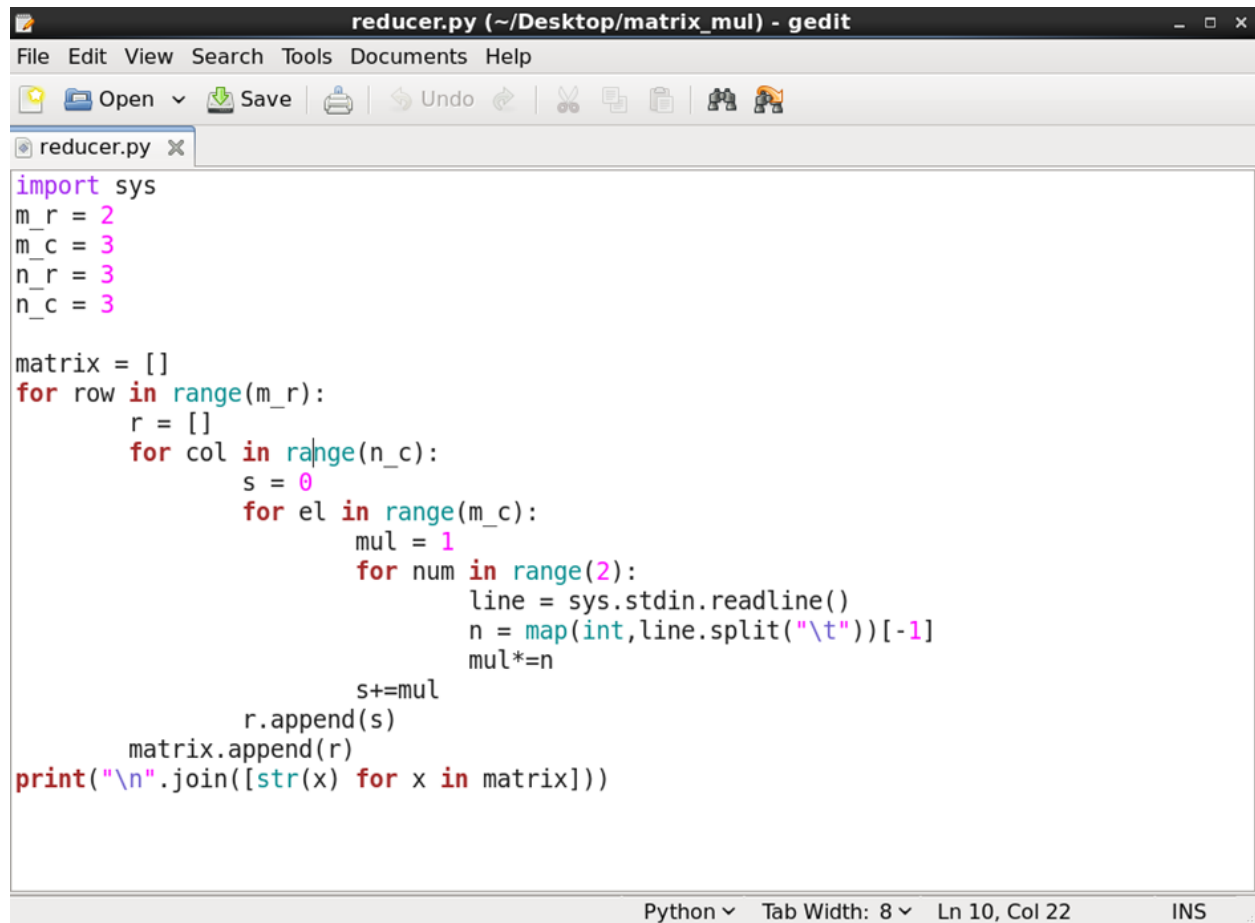
```

0    1    1    2
0    2    1    2
0    0    2    6
0    1    2    6
0    2    2    6

```

Step 3 : Create Reducer file reducer.py

[cloudera@quickstart matrix\_mul]\$ gedit reducer.py



```

import sys
m_r = 2
m_c = 3
n_r = 3
n_c = 3

matrix = []
for row in range(m_r):
    r = []
    for col in range(n_c):
        s = 0
        for el in range(m_c):
            mul = 1
            for num in range(2):
                line = sys.stdin.readline()
                n = map(int, line.split("\t"))[-1]
                mul *= n
            s += mul
        r.append(s)
    matrix.append(r)
print("\n".join([str(x) for x in matrix]))

```

Step 4 : to get matrix multiplication :

[cloudera@quickstart matrix\_mul]\$ cat m1.txt m2.txt | python mapper.py | python reducer.py

**Output :**

```

[7, 37, 91]
[61, 127, 217]

```