Calculating Portfolio Standard deviation for multiple assets

In [2]:
```
# Function that calculates portfolio Standard deviation
import math as m
def portf_std(wghts,cov_mat):
    """
    portf_Std: calculates the standrad deviation of a portfolio
    wgths: list weights
    cov_mat: array covariance matrix
    returns: float
    """
    var = 0
    for i,val in enumerate(wghts):
        for j,val2 in enumerate(wghts):
            var += val*val2*cov_mat[i][j]
    return m.sqrt(var)
```

Example: Using formula to calculate standard deviation of five assets

In [9]:
```
#weights of each securities
weights = [0.2,0.2,0.2,0.2,0.2]

# Covariance matrix
cov_mat = [[8.69E-05,5.89E-05,5.75E-05,6.42E-05,5.45E-05
],[5.89E-05,9.13E-05,7.61E-05,6.93E-05,5.44E-05
],[5.75E-05,7.61E-05,0.000179796,8.01E-05,5.53E-05
],[6.42E-05,6.93E-05,8.01E-05,0.000134139,6.48E-05
],[5.45E-05,5.44E-05,5.53E-05,6.48E-05,7.02E-05
]]

#Calculate SD
SD = portf_std(weights,cov_mat)
print("The standard deviation for the five securities becomes:", round(SD,4))
```

```
The standard deviation for the five securities becomes: 0.0086
```

References

https://faculty.washington.edu/ezivot/econ422/Portfolio%20Theory%20EZ.pdf