

```
In [2]: using LinearAlgebra
        A = rand(3,3)
```

```
Out[2]: 3×3 Array{Float64,2}:
 0.262707  0.722601  0.227894
 0.194994  0.545517  0.595722
 0.465314  0.686887  0.644692
```

```
In [3]: A2 = A^2
```

```
Out[3]: 3×3 Array{Float64,2}:
 0.31596   0.740561  0.63726
 0.434797  0.847685  0.753471
 0.556164  1.15377   0.930863
```

```
In [4]: dA = [0.001 0.002 0.003 ; 0.004 0.005 0.006 ; 0.007 0.008 0.009]
```

```
Out[4]: 3×3 Array{Float64,2}:
 0.001  0.002  0.003
 0.004  0.005  0.006
 0.007  0.008  0.009
```

```
In [5]: (A + dA)^2 - A2
```

```
Out[5]: 3×3 Array{Float64,2}:
 0.00682701  0.00987187  0.0105702
 0.0114308   0.0177037   0.0170739
 0.0154144   0.0252529   0.0236327
```

```
In [6]: A*dA + dA*A
```

```
Out[6]: 3×3 Array{Float64,2}:
 0.00679701  0.00983587  0.0105282
 0.0113648   0.0176227   0.0169779
 0.0153124   0.0251269   0.0234827
```

```
In [7]: 2*A*dA
```

```
Out[7]: 3×3 Array{Float64,2}:
 0.00949674  0.0119231  0.0143495
 0.0130942   0.0157667  0.0184392
 0.0154514   0.0190452  0.022639
```

```
In [8]: 2*dA*A
```

```
Out[8]: 3×3 Array{Float64,2}:
 0.00409727  0.00774859  0.00670683
 0.00963536  0.0194786   0.0155167
 0.0151735   0.0312086   0.0243265
```

```
In [9]: AI = inv(A)
```

```
Out[9]: 3×3 Array{Float64,2}:
 -0.85783  -4.61434   4.56708
  2.25985   0.944638  -1.67173
 -1.78861   2.32399   0.0359288
```

```
In [10]: inv(A+dA)-inv(A)
```

```
Out[10]: 3×3 Array{Float64,2}:  
  0.00361557  0.0219253 -0.0380485  
 -0.000140811 -0.0161177  0.0188606  
  0.00369236  0.0071466 -0.0214998
```

```
In [11]: -AI*dA*AI
```

```
Out[11]: 3×3 Array{Float64,2}:  
  0.0036997  0.0220909 -0.0385415  
 -0.0001703 -0.0161938  0.0190541  
  0.0037521  0.00724607 -0.0218293
```