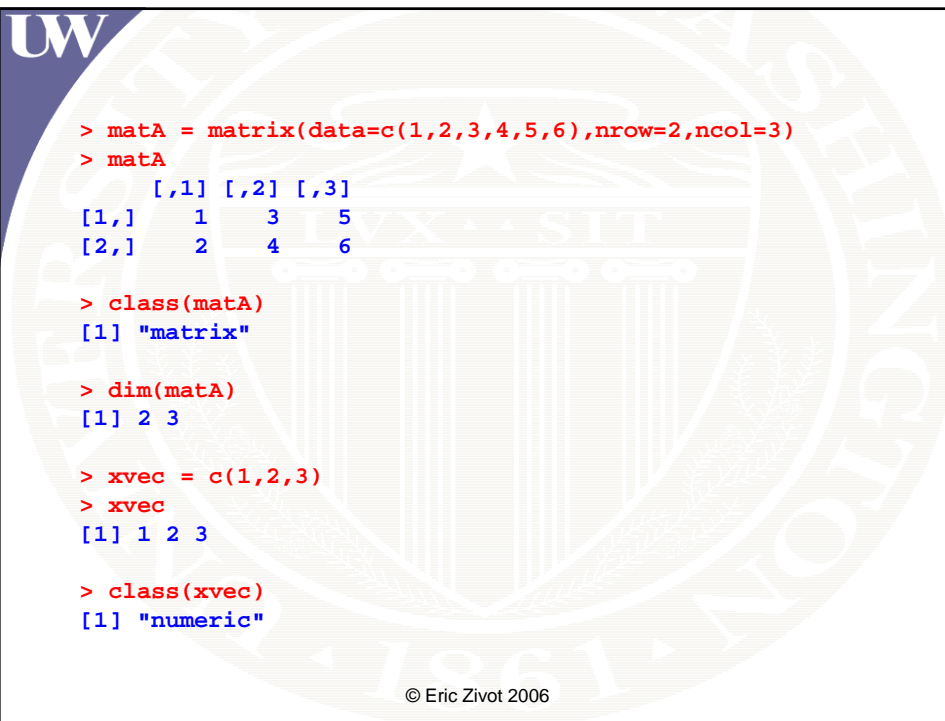



# Matrix Algebra Review

Econ 424  
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```
> matA = matrix(data=c(1,2,3,4,5,6),nrow=2,ncol=3)
> matA
      [,1] [,2] [,3]
[1,]    1    3    5
[2,]    2    4    6

> class(matA)
[1] "matrix"

> dim(matA)
[1] 2 3

> xvec = c(1,2,3)
> xvec
[1] 1 2 3

> class(xvec)
[1] "numeric"
```

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```
UW  
> xvec.mat = as.matrix(xvec)  
  
> xvec.mat  
  [,1]  
[1,] 1  
[2,] 2  
[3,] 3  
  
> class(xvec.mat)  
[1] "matrix"  
  
> t(matA)  
  [,1] [,2]  
[1,] 1 2  
[2,] 3 4  
[3,] 5 6  
  
> t(xvec.mat)  
  [,1] [,2] [,3]  
[1,] 1 2 3  
  
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```

```
UW  
> mats = matrix(c(1,2,2,1),2,2)  
  
> mats  
  [,1] [,2]  
[1,] 1 2  
[2,] 2 1  
  
# check for symmetry  
  
> mats == t(mats)  
  [,1] [,2]  
[1,] TRUE TRUE  
[2,] TRUE TRUE  
  
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```

```
UW > matA = matrix(c(4,9,2,1),2,2,byrow=T)
> matB = matrix(c(2,0,0,7),2,2,byrow=T)
> matA
  [,1] [,2]
[1,]  4   9
[2,]  2   1
> matB
  [,1] [,2]
[1,]  2   0
[2,]  0   7
> matC = matA + matB
> matC
  [,1] [,2]
[1,]  6   9
[2,]  2   8
> matC = matA - matB
> matC
  [,1] [,2]
[1,]  2   9
[2,]  2  -6
```

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```
UW > matA = matrix(1:4,2,2,byrow=T)
> matB = matrix(5:8,2,2,byrow=T)
> matA
  [,1] [,2]
[1,]  1   2
[2,]  3   4
> matB
  [,1] [,2]
[1,]  5   6
[2,]  7   8
> matC = matA**matB
> matC
  [,1] [,2]
[1,] 19  22
[2,] 43  50
```

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```
UW  
# create identity matrix  
> matI = diag(2)  
> matI  
      [,1] [,2]  
[1,]    1    0  
[2,]    0    1  
  
> matI**matA  
      [,1] [,2]  
[1,]    1    2  
[2,]    3    4  
  
> matA**matI  
      [,1] [,2]  
[1,]    1    2  
[2,]    3    4
```

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```
UW  
# matrix inversion  
> matA  
      [,1] [,2]  
[1,]    1    2  
[2,]    3    4  
  
> matA.inv = solve(matA)  
> matA.inv  
      [,1] [,2]  
[1,] -2.0  1.0  
[2,]  1.5 -0.5  
  
> matA**matA.inv  
      [,1] [,2]  
[1,]  1 1.110223e-16  
[2,]  0 1.000000e+00  
  
> matA.inv**matA  
      [,1] [,2]  
[1,] 1.000000e+00  0  
[2,] 1.110223e-16  1
```

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