

Econ 583 HW 1 #1
Cholesky Factorization

Note : the following computation are done using S-PLUS

```
> mA = matrix(c(2, 1, 1, 2), 2, 2, byrow = T)
> mA
      [,1] [,2]
[1,]    2    1
[2,]    1    2
> mC = matrix(c(1, 0, 0.5, 1), 2, 2, byrow = T)
> mC
      [,1] [,2]
[1,]  1.0    0
[2,]  0.5    1
> mD = matrix(c(2, 0, 0, 1.5), 2, 2, byrow = T)
> mD
      [,1] [,2]
[1,]    2  0.0
[2,]    0  1.5
> # A = CDC'
mC %*% mD %*% t(mC)
      [,1] [,2]
[1,]    2    1
[2,]    1    2
> # Cholesky factorization of A = BB', B lower triangular
mB = t(chol(mA))
> mB
      [,1] [,2]
[1,] 1.4142136 0.0000000
[2,] 0.7071068 1.224745
> mB %*% t(mB)
      [,1] [,2]
[1,]    2    1
[2,]    1    2
> # diagonalize A
solve(mC) %*% mA %*% t(solve(mC))
      [,1] [,2]
[1,]    2  0.0
[2,]    0  1.5
```