Review for Exam1 (September 30, Wednesday, 3:00-5:00, Room 230, FLO.)
(closed book. Coverage: Chapters 1-7, only lectured materials will be covered. No R programming questions.)

A. Memorize the following definitions.

A.1 Elementary row (column) operations and their matrix representation. (from lecture)

A.2 Column rank, row rank, rank and trace of a matrix

A.3 Linear space, linear independence, dimension of a subspace, basis, and orthonormal basis

A.4 Inner product and Gram-Schmidt orthogonalization algorithm

A.5 Orthogonal matrix

B. Memorize the following facts or key theorems and the ideas behind their proofs.

B.1 The column rank of any matrix is the same as its row rank. (Theorem 4.4.1)

B.2 Corollary 4.4.5 (Multiplication cannot increase rank.) and Theorem 4.4.9 ($\boldsymbol{A} = \boldsymbol{B}(\sim \boldsymbol{I}_{r\times r})\boldsymbol{K}$)

B.3 tr(AB)=tr(BA) (Lemma 5.2.1)

B.4 Lemma 5.3.1 (Tr(A'A)=0 iff A=0.)

B.5 A square matrix is invertible if and only if it is full rank.

C. Things to review

C.1 Exercises 1-4.

C.2 Applications of matrix algebra (from lecture).