مسئله مخصوص کارشناسی ارشد

پردازش اطلاعات در اصلاح دام

ترم تحصیلی : اول ۹۳ - ۱۳۹۲ **تعداد واحد :** ۲ واحد

ساعات کلاس : دو شنبه ها - ۸ صبح بمدت دو ساعت

منابع اصلی:

- Mrode, R. A. 2005. Linear Models for the Prediction of Animal Breeding Values, 2nd Edition. CAB International, Wallingford, Oxfordshire, UK
- Madsen, P., Jensen, J., 2008. A User's Guide to DMU. A Package for Analysing Multivariate Mixed Models. Version 6, release 4.5. http://dmu.agrsci.dk
- Linear models and animal breeding – by: LR Schaeffer

IML (Interactive Matrix Language)

```
PROC IML;          <-

   ... ...
   ... ...
   ... ...

QUIT;              <-
```

```
PRINT A;                  <-
PRINT A [format 8.1];     <-

PRINT A B C;              <-
PRINT A, B, C;            <-
```

Setting up matrix

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix}$$

```
PROC IML;
  A = {1  2  3  4,
       5  6  7  8,
       9 10 11 12};
  PRINT A;
QUIT;
```

sub-matrices

```
i) A1 = A[3,];     <-
```

$$A1 = \begin{bmatrix} 9 & 10 & 11 & 12 \end{bmatrix}$$

```
ii) A2 = A[,2];    <-
```

$$A2 = \begin{bmatrix} 2 \\ 6 \\ 10 \end{bmatrix}$$

iii) A3 = A[3,2]; <-

$$A3 = 10$$

iv) A4= A[{1 3},{2 4}]; <-

$$A4 = \begin{bmatrix} 2 & 4 \\ 10 & 12 \end{bmatrix}$$

i) A[1,1] = 100; <-

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix} \text{ -> } A = \begin{bmatrix} 100 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix}$$

ii) A[1,] = {0 0 0 0}; <-

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix} \text{ -> } A = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix}$$

ii) A[,1] = {0, 0, 0}; <-

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix} \text{ -> } A = \begin{bmatrix} 0 & 2 & 3 & 4 \\ 0 & 6 & 7 & 8 \\ 0 & 10 & 11 & 12 \end{bmatrix}$$

i) J-function

```
B = J(2,3,4);          <-
```

$$\boldsymbol{B} = \begin{bmatrix} 4 & 4 & 4 \\ 4 & 4 & 4 \end{bmatrix}$$

ii) I-function

```
B = I(3);              <-
```

$$\boldsymbol{B} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

iii) diag function

```
B = DIAG({1,2,3});     <-
```

$$\boldsymbol{B} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$$

(Matrix operation)

4.1 C = A + B	: (addition)
4.2 C = A – B	: (substraction)
4.3 C = A * B	: (multiplication)
4.4 C = A # 4	: (scalar multiplication)
4.5 C = A`	: transpose (scalar multiplication)
4.6 C = A@ B	: Kronecor product
4.7 C = A**2	:

(Important function)

5.1 C = T(A)	: transpose A
5.2 C = INV(A)	: inverse A
5.3 C = GINV(A)	: Penrose generalized inverse
5.4 C = EIGVAL(A)	: eigen value
5.5 C = EIGVEC(A)	: eigen vector
5.6 C = HALF(A)	: Cholesky decomposition
5.7 C = NCOL(A)	:
5.8 C = NROW(A)	:

SAS data set

```
DATA one;
  INPUT x y z;
CARDS;
1 2 3
4 5 6
7 8 9
;
PROC IML;
  USE one;
  READ ALL VAR{x y z} INTO A;
  READ ALL VAR{x y} INTO B;
  READ ALL VAR{x y} INTO C WHERE (Z=3);
  PRINT A, B, C;
QUIT;
```

$$\boldsymbol{A} = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix},$$

$$\boldsymbol{B} = \begin{bmatrix} 1 & 2 \\ 4 & 5 \\ 7 & 8 \end{bmatrix},$$

$$\boldsymbol{C} = \begin{bmatrix} 1 & 2 \end{bmatrix}$$