program (part 1)

Q1: Write the command and the result to calculate the following :

Log(17)=

```
> log10(17)
[1] 1.230449
> log(17,base=10)
[1] 1.230449
>
```

Ln(14)=

```
> log(14)
[1] 2.639057
>
```

$$\binom{50}{4} =$$

```
> choose(50,4)
[1] 230300
>
```

$\Gamma(18)$,

```
> gamma(18)
[1] 3.556874e+14
>
```

4!=

```
> factorial(4)
[1] 24
```

Q2: Let x=6 and y=2 find:

$x+y$, $x-y$, $x \div y$, xy

```
> x<-6
> y<-2
> x
[1] 6
> y
[1] 2
> x+y
[1] 8
> x-y
[1] 4
> x/y
[1] 3
> x*y
[1] 12
>
```

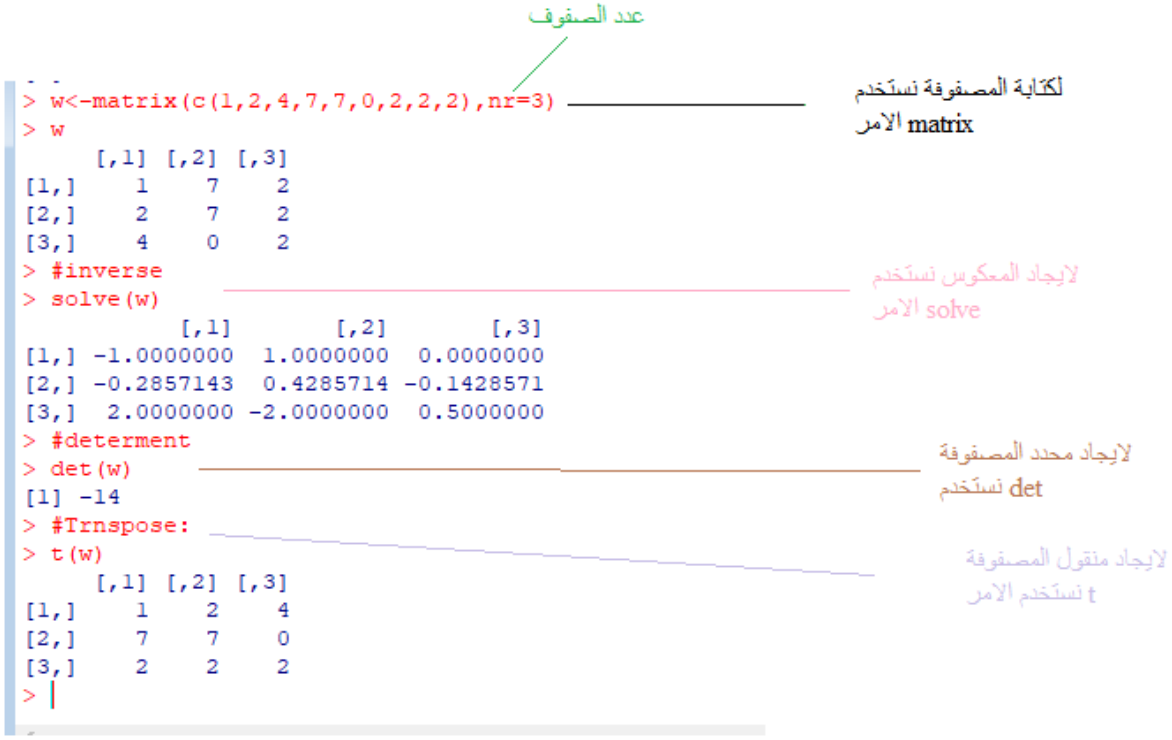
Q3: If $a = \begin{bmatrix} 1 \\ 2 \\ 3 \\ 3 \end{bmatrix}$ **, b=** $\begin{bmatrix} 6 \\ 7 \\ 8 \\ 9 \end{bmatrix}$ **. find :**

$a+b$, $a-b$, ab , $a \div b$

```
> a<-c(1,2,3,3)
> b<-c(6,7,8,9)
> a
[1] 1 2 3 3
> b
[1] 6 7 8 9
> a+b
[1]  7  9 11 12
> a-b
[1] -5 -5 -5 -6
> a*b
[1]  6 14 24 27
> a/b
[1] 0.1666667 0.2857143 0.3750000 0.3333333
>
```

Q3: write the commends and results to find the determent of matrix and its inverse

$$w = \begin{bmatrix} 1 & 7 & 2 \\ 2 & 7 & 2 \\ 4 & 0 & 2 \end{bmatrix}$$




```
> w<-matrix(c(1,2,4,7,7,0,2,2,2),nr=3)
> w
     [,1] [,2] [,3]
[1,]    1    7    2
[2,]    2    7    2
[3,]    4    0    2
> #inverse
> solve(w)
           [,1]       [,2]       [,3]
[1,] -1.0000000  1.0000000  0.0000000
[2,] -0.2857143  0.4285714 -0.1428571
[3,]  2.0000000 -2.0000000  0.5000000
> #determent
> det(w)
[1] -14
> #Trnspose:
> t(w)
     [,1] [,2] [,3]
[1,]    1    2    4
[2,]    7    7    0
[3,]    2    2    2
>
```

$$A=\begin{bmatrix}1 & 6 & 3 & -1\\ 5 & 2 & 7 & 4\end{bmatrix},\ B=\begin{bmatrix}1 & 9 & 8\\ 7 & 4 & 2\\ 5 & 1 & 5\\ 1 & 1 & 9\end{bmatrix},\ C=\begin{bmatrix}3 & 4 & 2 & 7\\ 4 & 9 & 0 & 6\\ 3 & 8 & 3 & 2\\ 3 & 4 & 6 & 2\end{bmatrix}$$

(a) A*B

(b) Determinant of C

(c) Inverse of C

```
> A<-matrix(c(1,5,6,2,3,7,-1,4),nr=2)
> A
     [,1] [,2] [,3] [,4]
[1,]    1    6    3   -1
[2,]    5    2    7    4
> B<-matrix(c(1,7,5,1,9,4,1,1,8,2,5,9),nr=4)
> B
     [,1] [,2] [,3]
[1,]    1    9    8
[2,]    7    4    2
[3,]    5    1    5
[4,]    1    1    9
> C<-matrix(c(3,4,3,3,4,9,8,4,2,0,3,6,7,6,2,2),nr=4)
> C
     [,1] [,2] [,3] [,4]
[1,]    3    4    2    7
[2,]    4    9    0    6
[3,]    3    8    3    2
[4,]    3    4    6    2
> A%*%B
     [,1] [,2] [,3]
[1,]   57   35   26
[2,]   58   64  115
> det(C)
[1] -155
> solve(C)
           [,1]       [,2]       [,3]        [,4]
[1,] -1.0451613  1.3677419 -1.5870968  1.14193548
[2,]  0.1935484 -0.2903226  0.5161290 -0.32258065
[3,]  0.2580645 -0.3870968  0.3548387 -0.09677419
[4,]  0.4064516 -0.3096774  0.2838710 -0.27741935
>
```

A sample of families were selected and the number of children in each family was considered as follows:

6, 7, 0, 8, 3, 7, 8, 9

Find mean , median , range , variance , standard deviation?

```
> xx<-c(6,7,0,8,3,7,8,0)
> xx
[1] 6 7 0 8 3 7 8 0
> mean(xx)
[1] 4.875
> median(xx)
[1] 6.5
> var(x)
[1] NA
> var(xx)
[1] 11.55357
> sd(xx)
[1] 3.399054
> summary(xx)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.000   2.250   6.500   4.875   7.250   8.000
> range(xx)
[1] 0 8
>
```