

# Matlab Commands Guidance

## Steps to running Matlab

1. Construct working fold in some appropriate place, such as at desktop creating a fold named "STAT3710".
2. Download dataset files and programs including functions for ellipse and Chi-square plot and Box-Cox transformation from the course webstie to the working fold.
3. Open the Matlab and change the working fold.
4. Begin to run matlab commands and programs.

### *Example 1.4*

```
>> load payroll.DAT
>> [n,p]=size(playroll)
>> scatter(playroll(:,1), playroll(:,2)) }
```

### *Example 1.5*

```
>> load paper_quality.DAT
>> [n,p]=size(paper_quality)
>> plotmatrix(paper_quality,'o')
>> boxplot(paper_quality(:,1))
>> boxplot(paper_quality(:,2))
>> boxplot(paper_quality(:,3))
```

### *Example 1.6*

```
>> load('Lizard_Size.mat')
>> scatter3(Data_all(:,2), Data_all(:,3), Data_all(:,4))
>> figure
>> F=Data_all(Data_all(:,5)==1,:)
>> M=Data_all(Data_all(:,5)==0,:)
>> scatter3(F(:,2), F(:,3), F(:,4),'.')
>> hold on
>> scatter3(M(:,2), M(:,3), M(:,4))
```

### *Example 1.10*

```
>> load('Bear.mat')
>> plot(Bear(:,2:5)')
>> figure
>> plot(Bear(:,6:9)')
```

### *Example 1.11*

```
>> load('Utility.txt')
>> glyphplot(Utility,'glyph','star')
>> figure
>> glyphplot(Utility,'glyph','face')
```

## *Chapter 3*

```
>> clear all  
>> Example310  
>> Example314  
>> Example317
```

### *Example 4.2*

```
>> load('T5-1.DAT')
>> X=T5_1
>> mean(X)
>> median(X)
>> S=cov(X)
>> Sinv= inv(S)
>> [n,p]=size(X)
>> u0=[4 50 10]
>> T2=n*(mean(X)-u0)*Sinv*(mean(X)-u0)'
```

T2=9.7388

```
>>finv(1-0.10, p, n-p)*(n-1)*p/(n-p)
```

ans=8.1726

### *Example 4.3*

```
>> load('T4-1.DAT')
>> load('T4-5.DAT')
>> X=[T4_1 T4_5]
>> [n,p]=size(X)
>> X_new=X.^(1/4)
>> X_bar=mean(X_new)
>> S=cov(X_new)
>> [V,D]=eig(S)
>> lambda=diag(D)
>> length1=sqrt(lambda(1))*sqrt(p*(n-1)/n/(n-p)*finv(1-0.05,p,n-p))
>> length2=sqrt(lambda(2))*sqrt(p*(n-1)/n/(n-p)*finv(1-0.05,p,n-p))
>> ellipse(X_bar,V(:,1), V(:,2),length1, length2)
```

### Example 4.5

```
>> load('T5-2.DAT')
>> X=T5_2
>> X_bar=mean(X)
>> S=cov(X)
>> Sinv= inv(S)
>> [n,p]=size(X)
>> C=p*(n-1)/(n-p)*finv(1-0.05,p,n-p)
```

```
C= 8.3335
```

```
>> [X_bar'-sqrt(C)*sqrt(diag(S/n)) X_bar'+sqrt(C)*sqrt(diag(S/n))]
```

```
ans =
```

```
502.9994    550.1730
  51.2148     58.1645
  23.6385     26.6143
```



### *Example 4.7*

```
>> X=load('T6-1.DAT')
>> X1=X(:,1:2)
>> X2=X(:,3:4)
>> d=X1-X2
>> d_bar=mean(d)
>> Sd=cov(d)
>> [n,p]=size(X1)
>> T2=n*d_bar*inv(Sd)*d_bar'
```

T2=13.6393

```
>>p*(n-1)/(n-p)*fin(1-0.05,p,n-p)
```

ans=9.4589

```
>> [d_bar'-sqrt((n-1)*p/(n-p)*finv(1-0.05,p,n-p))*sqrt(diag(Sd)/n)
d_bar'+sqrt((n-1)*p/(n-p)*finv(1-0.05,p,n-p))*sqrt(diag(Sd)/n) ]
```

```
ans =
```

```
-22.4533    3.7260
-5.7001    32.2456
```