Stat380 A2

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Q1

1a

```
x+matrix(rep(1:3,3),3,byrow = T)
```

```
##      [,1] [,2] [,3]
## [1,]    3    3    4
## [2,]    2    4    4
## [3,]    2    3    5
```

1b

```
apply(x, 1, mean)
```

```
## [1] 1.333333 1.333333 1.333333
```

1c

```
x%*%matrix(rep(NA,9),3)
```

```
##      [,1] [,2] [,3]
## [1,]   NA   NA   NA
## [2,]   NA   NA   NA
## [3,]   NA   NA   NA
```

1d

```
x*.75
```

```
##      [,1] [,2] [,3]
## [1,] 1.50 0.75 0.75
## [2,] 0.75 1.50 0.75
## [3,] 0.75 0.75 1.50
```

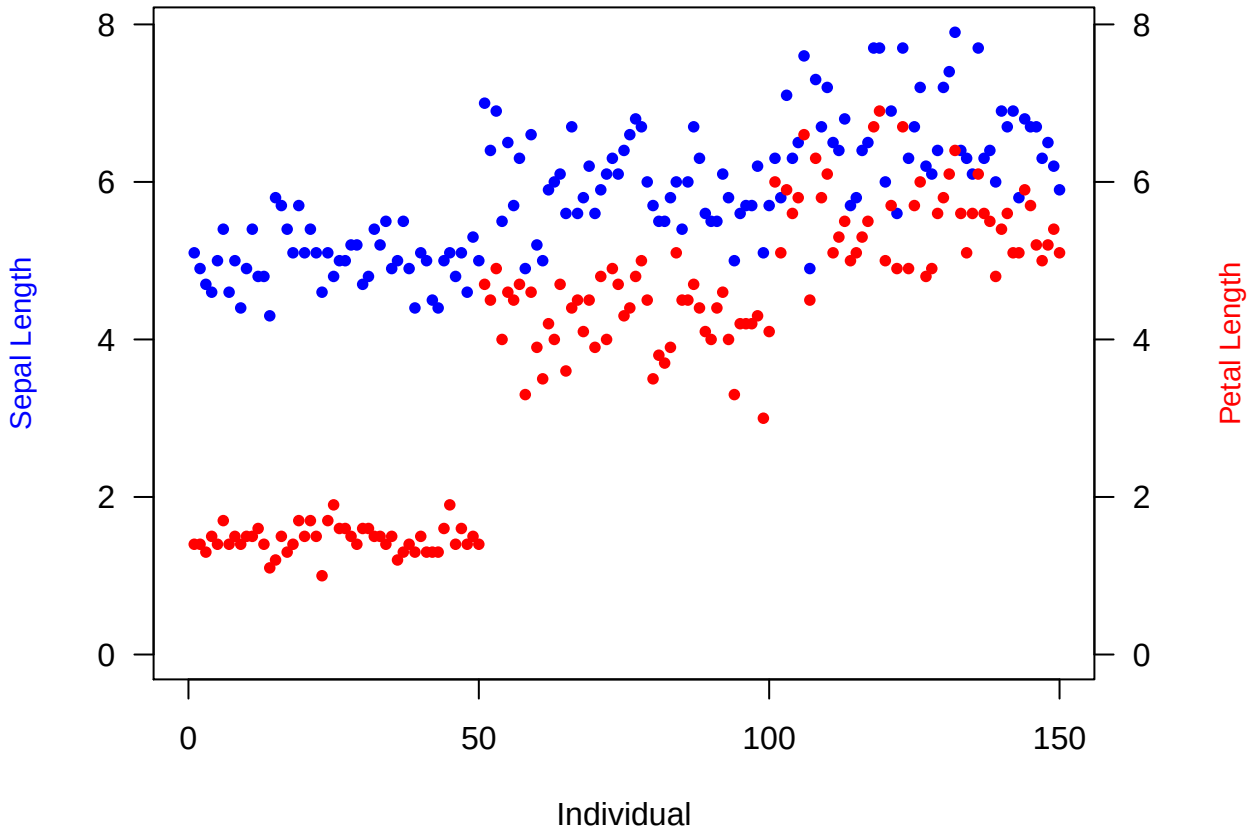
1e

```
solve(x)
```

```
##       [,1]  [,2]  [,3]
## [1,]  0.75 -0.25 -0.25
## [2,] -0.25  0.75 -0.25
## [3,] -0.25 -0.25  0.75
```

Q2

```
mod=par(mar=c(4,4,1,4))
plot.new()
plot.window(xlim = c(0,length(iris$Sepal.Length)),ylim = c(0,max(iris$Sepal.Length)))
points(1:length(iris$Sepal.Length),iris$Sepal.Length,col='blue',pch=16,cex=.8)
points(1:length(iris$Sepal.Length),iris$Petal.Length,col='red',pch=16,cex=.8)
axis(1)
axis(2,las=1)
axis(4,las=1)
box()
mtext('Individual',side = 1,line = 3,font = 1)
mtext('Sepal Length',side = 2,line = 3,col = 'blue',cex=.9)
mtext('Petal Length',side = 4,line = 3,col = 'red',cex=.9)
```

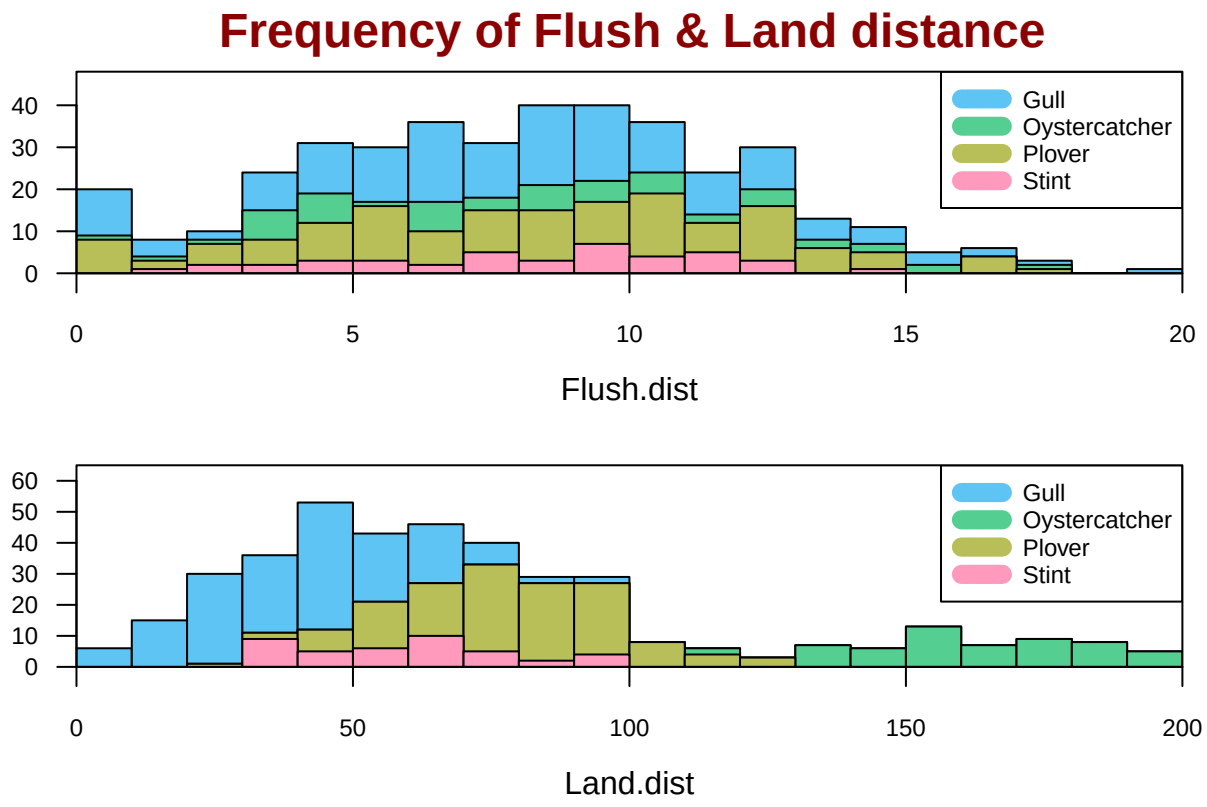


```
par(mod)
```

Q3

```
stratified.hist= function(x , y, breaks = 20, xlab = NULL ,
                          ylab = NULL, main = "" , cex = 1)
{
  cols=hcl(h=c(230,145,90,351),c=64,l=75)
  y=factor(y)
  nms=levels(y)

  if (length(x) == length(data$flush.dist)){
    if (any(x<5)){
      if (length(y) == length(data$Species)){
      hist(x, breaks = breaks, col = cols[1], ylab = '', cex.axis = .75,
      main = main, xlab = '', xaxs='i', yaxs='i', ylim = c(0,48), las=1)

      hist(x[which(y!='Gull')], breaks = breaks, add = T, col = cols[2])

      hist(x[which(y%in%nms[3:4])],
           breaks = breaks, col = cols[3], add = T)

      hist(x[which(y=='Stint')], col = cols[4],
           xlim = c(0,20), add = T, breaks = 10)

      mtext('Flush.dist',side = 1,font = 1,line = 2.5)
      mtext('Frequency of Flush & Land distance',col='darkred',
            cex=1.47,outer=T,font=2,at=.535,line = .45)
      legend('topright',legend = nms,cex = .71,lty = 1,lwd=9.5,col = cols[1:4])
      box()
      }else {stop("unequal length data vectors")}
    }

    else{
      if (length(y) == length(data$Species)){
      hist(x, breaks = 20,col = cols[1], ylab = '', main = main, cex.axis = .75,
           xlab = '', xaxs = 'i', yaxs = 'i',las = 1, ylim = c(0,65))

      hist(x[which(y!='Gull')], breaks = breaks, add = T, col = cols[2])

      hist(x[which(y%in%nms[3:4])],
           col = cols[3], xlim = c(0,200), breaks = 10, add = T)

      hist(x[which(y=='Stint')],col = cols[4], xlim = c(0,200), add = T)

      mtext('Land.dist',side = 1,font = 1,line = 2.5)
      legend('topright',legend = nms,cex = .71,lty = 1,lwd=9.6,col = cols[1:4])
      box()
      }else {stop("unequal length data vectors")}
    }
  }
```

```
  else if (length(x) != length(data$flush.dist)){
    stop("unequal length data vectors")
  }
}

frame = par(mfrow=c(2,1),mar=c(5,2,0,0),oma=c(0,.2,2,1.5))

stratified.hist(data$flush.dist,data$Species,breaks = 20,
                xlab = NULL , ylab = NULL, main = "" , cex = 1)

stratified.hist(data$land.dist,data$Species,breaks = 20,
                xlab = NULL , ylab = NULL, main = "" , cex = 1)
```




```
par(frame)
```