Homework5

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Exercise 3.12

Let subset.iris <- as.matrix(iris[1:10, 1:4]), Using apply function to calculate the mean of subset.iris by column.

```
subset.iris <- as.matrix(iris[1:10, 1:4])
apply(subset.iris, 2, mean)

## Sepal.Length Sepal.Width Petal.Length Petal.Width
## 4.86 3.31 1.45 0.22</pre>
```

Exercise 3.13

Let subset.iris.2 <- as.matrix(iris[, 1:4]), fill blanks in the find.max function defined below to find the maximal value in each column of subset.iris.2.

```
find.max <- function(x){
   y <- function(xcol){
      return(which.max(xcol))
}
   return(apply(x, 2, y))
}

subset.iris.2 <- as.matrix(iris[, 1:4])
find.max(subset.iris.2)

## Sepal.Length Sepal.Width Petal.Length Petal.Width</pre>
```

Exercise 3.14

132

##

Using the mosaic.plot() function to blur the image of mona_lisa.pgm by adding mosaic to her eyes region. Your output should look like the graph below.

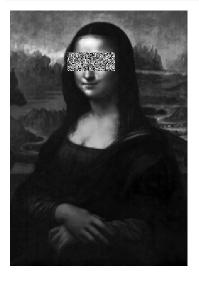
101

119

16

```
library(pixmap)
mona_lisa <- read.pnm("mona_lisa.pgm",cellres = 1)
#plot(mona_lisa)
#str(mona_lisa)
mosaic.plot <- function(image, yrange, xrange){
  length.y <- length(yrange)
  length.x <- length(xrange)
  image2 <- image</pre>
```

```
whitenoise <- matrix(nrow = length.y, ncol = length.x, runif(length.y * length.x))
image2@grey[yrange, xrange] <- whitenoise
  return(image2)
}
mona_lisa.mosaic <- mosaic.plot(mona_lisa, 60:85, 82:148)
plot(mona_lisa.mosaic)</pre>
```



Exercise 3.15

Fill in blanks of the following function so that the eyes region of Mona Lisa is covered by pure color, not mosaic

Setting the degree=0, 0.5 and 1 respectively, plot the images of Mona Lisa that eyes region are covered by pure colors.

```
mosaic.plot.2 <- function(picture, yrange, xrange, degree){
length.y <- length(yrange)
length.x <- length(xrange)
pic2 <- picture
pic2@grey[yrange,xrange] <- degree
return(pic2)
}
mona_lisa.mosaic <- mosaic.plot.2(mona_lisa, 60:85, 82:148, 0)
plot(mona_lisa.mosaic)</pre>
```



mona_lisa.mosaic <- mosaic.plot.2(mona_lisa, 60:85, 82:148, 0.5)
plot(mona_lisa.mosaic)</pre>



mona_lisa.mosaic <- mosaic.plot.2(mona_lisa, 60:85, 82:148, 1)
plot(mona_lisa.mosaic)</pre>

