

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
```

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
##           132           16           119           101
```

Exercise 3.14

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.

```
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
```

```

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)

```



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)

```



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



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

