

Homework 1

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Exercise_1

```
shots = c(
  8, 5, 12, 11, 12, 8, 6, 7, 11, 7, 11, 13, 15,
  12, 17, 12, 9, 15, 8, 11, 11, 13, 10, 8, 12, 12, 11,
  13, 12, 14, 9, 11, 13, 10, 10, 12, 13, 10, 15, 12, 15, 12
)
```

1.1

```
f = function(p, element){
  x = dbinom(x=element, 30, p)
  log(x)
}
```

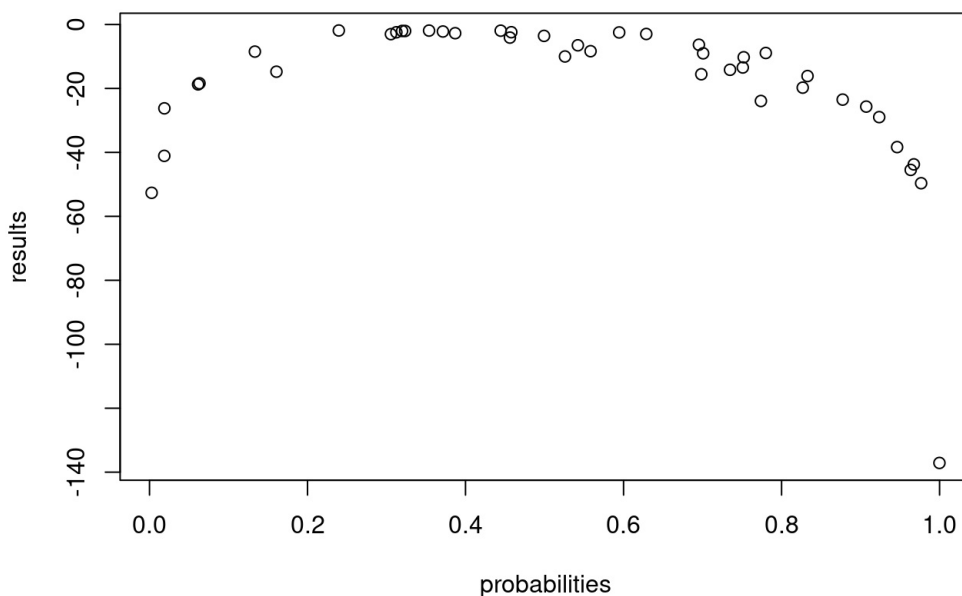
1.2

```
probabilities = runif(n=length(shots))
results = c()

for (i in 1:length(shots)) {
  prob = f(probabilities[i], shots[i])
  results = append(results, prob)
}
```

1.3

```
plot(x = probabilities, y = results, type="p")
```



1.4

```
getTheBestProb = function(probabilities, probs){
  probabilities[which.max(probs)]
}

getTheBestProb(probabilities, results)
```

```
## [1] 0.2396285
```

Exercise_2

2.1

```
cars = mtcars[1:5, ]
```

2.2

```
rownames(mtcars)[which.max(mtcars$hp)]
```

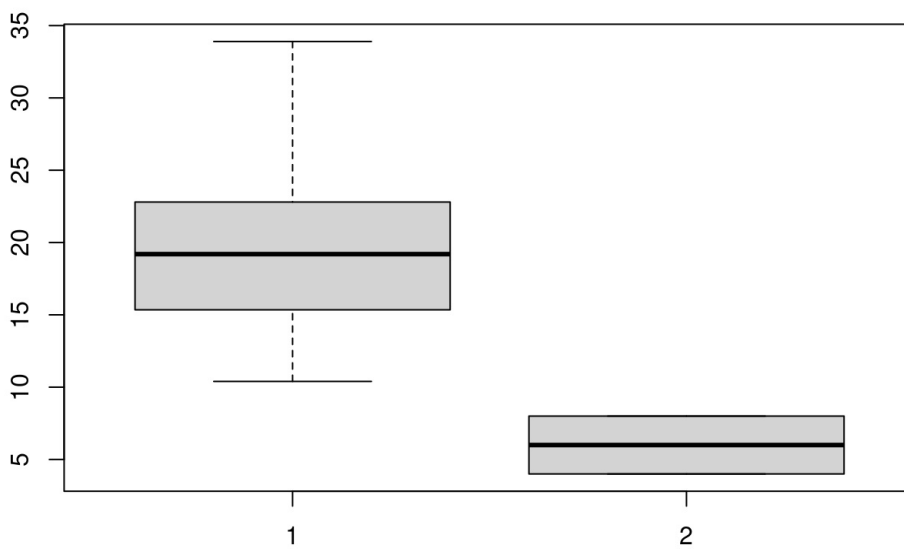
```
## [1] "Maserati Bora"
```

```
rownames(mtcars[order(mtcars$wt), ])[1:5]
```

```
## [1] "Lotus Europa"  "Honda Civic"   "Toyota Corolla" "Fiat X1-9"  
## [5] "Porsche 914-2"
```

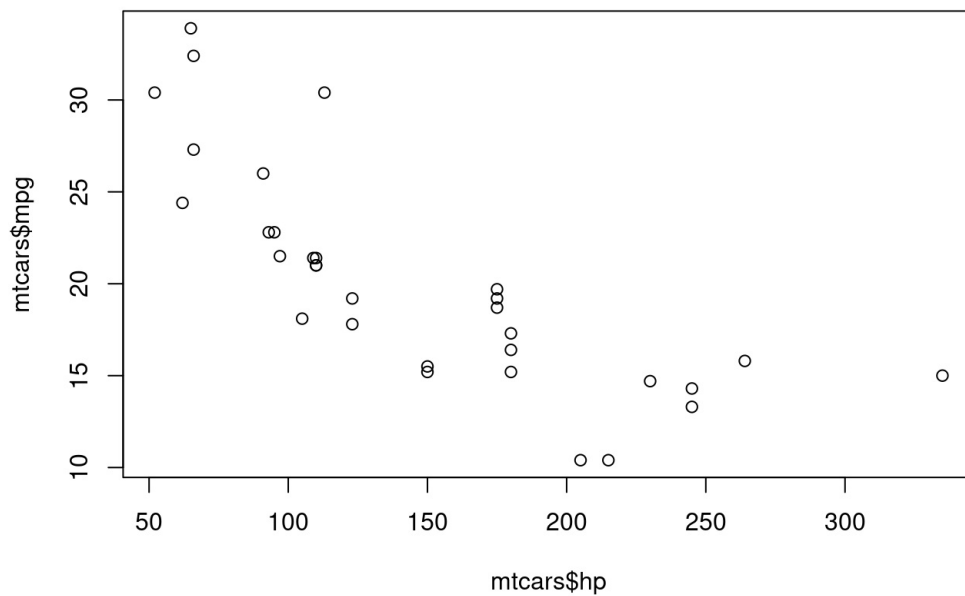
2.3

```
boxplot(mtcars$mpg, mtcars$cyl)
```



2.4

```
plot(mtcars$hp, mtcars$mpg)
```



```
cor(mtcars$hp, mtcars$mpg)
```

```
## [1] -0.7761684
```

2.5

```
quantile(mtcars$hp, 0.80)
```

```
## 80%
```

```
## 200
```

2.6

```
sum(mtcars$hp < 100) / length(mtcars$hp) * 100
```

```
## [1] 28.125
```

2.7

```
prop.table(table(mtcars$cyl, mtcars$gear), 2)[3, 3]
```

```
## [1] 0.4
```

Exercise_3

```
boughtGums = function(){
  gumsNumber = 20

  while(TRUE){
    gums = sample(1:20, size=gumsNumber, replace=T)
    uniqueGums = unique(gums)

    if(length(uniqueGums) == 20){
      print(gumsNumber)
      break
    }
    else{
      gumsNumber = gumsNumber + 1
    }
  }
}

boughtGums()
```

