Homework 1

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Problem 1

a)

```
seq(to=4835,from=4751,by=7)
```

```
##  [1] 4751 4758 4765 4772 4779 4786 4793 4800 4807 4814 4821 4828 4835
```

```
## Your code goes here without the ## in front.
# A citation of used code goes here with the # in front.
```

b)

```
rep("Night",4)
```

```
## [1] "Night" "Night" "Night" "Night"
```

c)

```
seq(to=101,from=89,by=1)
```

```
##  [1]  89  90  91  92  93  94  95  96  97  98  99 100 101
```

d)

```
rep(21:18, c(3,3,3,3))
```

```
##  [1] 21 21 21 20 20 20 19 19 19 18 18 18
```

e)

```
seq(to=57,from=75,by=-3)
```

```
## [1] 75 72 69 66 63 60 57
```

f)

```
c(seq(to=75,from=25,by=10),seq(to=50,from=70,by=-5))
```

```
##  [1] 25 35 45 55 65 75 70 65 60 55 50
```

g)

```
rep(seq(to=500,from=400,by=25),5:1)
```

```
##  [1] 400 400 400 400 400 425 425 425 425 450 450 450 475 475 500
```

h)

```
rep(3:1,5)
```

```
##  [1] 3 2 1 3 2 1 3 2 1 3 2 1 3 2 1
```

i)

```
c(seq(to=68,from=124,by=-8),seq(to=38,from=63,by=-5))
```

```
##  [1] 124 116 108 100  92  84  76  68  63  58  53  48  43  38
```

j)

```
rep(c("Morning","Afternoon","Night"),2)
```

```
## [1] "Morning"   "Afternoon" "Night"     "Morning"   "Afternoon" "Night"
```

Problem 2

a)

```
dnorm(26.24, mean=63, sd=11)
```

```
## [1] 0.0001362924
```

There is a .01% chance that this time is beaten in this race. ### b)

```
qnorm(0.05, mean=63, sd=11)
```

```
## [1] 44.90661
```

The target time for the runner should be any time under 44.9 minutes. ### c)

```
#29000 runners
29000* (1-pnorm(90, mean=63, sd=11))
```

```
## [1] 204.5411
```

Around 205 runners will likely have their races disrupted by the resumption of traffic.

Problem 3

a)

```
lie_1 = 1-pbinom(0,12,0.2)
lie_1
```

```
## [1] 0.9312805
```

b)

```
vect_num_lie = 0:11
lie_new <- 1-pbinom(vect_num_lie,12,0.2)
lie_new <- round(lie_new, 3)
lie_new
```

```
##  [1] 0.931 0.725 0.442 0.205 0.073 0.019 0.004 0.001 0.000 0.000 0.000 0.000
```

c)

```
lie_3 = lie_new
lie_3Matrix = rbind(vect_num_lie, lie_3)
lie_3Matrix
```

```
##                [,1]  [,2]  [,3]  [,4]  [,5]  [,6]  [,7]  [,8] [,9] [,10] [,11]
## vect_num_lie 0.000 1.000 2.000 3.000 4.000 5.000 6.000 7.000    8     9    10
## lie_3        0.931 0.725 0.442 0.205 0.073 0.019 0.004 0.001    0     0     0
##               [,12]
## vect_num_lie    11
## lie_3            0
```

The column names are confusing in this case as they are one of from the number of successes in this data set.

d)

```
names(lie_new) = vect_num_lie
lie_new
```

```
##     0     1     2     3     4     5     6     7     8     9    10    11
## 0.931 0.725 0.442 0.205 0.073 0.019 0.004 0.001 0.000 0.000 0.000 0.000
```

e)

The presentation method in section d is much easier to read and understand what it is trying to convey, even though it is missing row names.

f)

```
data_lie <- data.frame(vect_num_lie, lie_new)
data_lie
```

```
##    vect_num_lie lie_new
## 0             0   0.931
## 1             1   0.725
## 2             2   0.442
## 3             3   0.205
## 4             4   0.073
## 5             5   0.019
## 6             6   0.004
## 7             7   0.001
## 8             8   0.000
## 9             9   0.000
## 10           10   0.000
## 11           11   0.000
```

g)

```
data_lie2 = data.frame(lie_new)
data_lie2
```

```
##    lie_new
## 0    0.931
## 1    0.725
## 2    0.442
## 3    0.205
## 4    0.073
## 5    0.019
## 6    0.004
## 7    0.001
## 8    0.000
## 9    0.000
## 10   0.000
## 11   0.000
```

h)

The data frame created in 3f is a better presentation of the data. While the number repeat, it still includes a column name that allows the viewer to interpret what it means, which is not possible with the data frame created in 3g.

Problem 4

```
course_data = data.frame(Course1 = '"Stat 2559"', Course2 ='"Stat 3080"', row.names = ""
Course1 <- list(5)
Course2 <- list(75, 90, 90)
teach_data = data.frame(Course1 = FALSE, Course2 = TRUE, row.names = "")
myList <- list(Name = "Gretchen Martinet",
               Department= "Statistics",
               Courses= course_data, ActiveTeach = teach_data,
               Enr = list(Course1 = 5, Course2 = c(75, 90, 90)), Days = list( Course1 =

                                                                                ))
print(myList)
```

```
## $Name
## [1] "Gretchen Martinet"
##
## $Department
## [1] "Statistics"
##
## $Courses
##      Course1     Course2
##  "Stat 2559" "Stat 3080"
##
## $ActiveTeach
##  Course1 Course2
##    FALSE    TRUE
##
## $Enr
## $Enr$Course1
## [1] 5
##
## $Enr$Course2
## [1] 75 90 90
##
##
## $Days
## $Days$Course1
## [1] "Tuesday"  "Thursday"
##
## $Days$Course2
##      [,1]      [,2]
## [1,] "Monday"  "Wednesday"
## [2,] "Tuesday" "Thursday"
## [3,] "Tuesday" "Thursday"
```

References

1. https://stackoverflow.com/questions/24428051/removing-display-of-row-names-from-data-frame
2. https://stackoverflow.com/questions/22234368/creating-a-matrix-from-multiple-column-vectors
3. https://stackoverflow.com/questions/10776742/how-can-i-make-a-list-of-lists-in-r