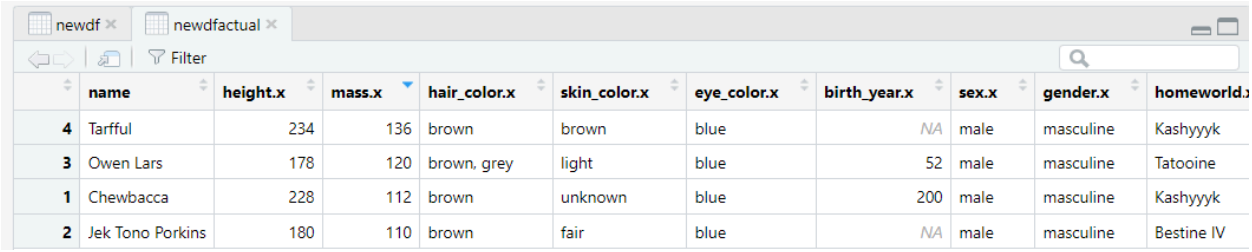
1.

```
> CreditHours <- c(5,3,3,3,3)
> Difficulty <- c(7,5,6,4,3)
> Workload <- c(10,6,7,5,4)

> df = data.frame(CreditHours,Difficulty,Workload)

names = c("Japanese","Trig","CS Principles","CS STATS","INOV")
rownames(df) = names

> df
             CreditHours Difficulty Workload
Japanese               5          7       10
Trig                   3          5        6
CS Principles          3          6        7
CS STATS               3          4        5
INOV                   3          3        4
```

2A.

```
newdf1 = subset(starwars,mass >= 100)
newdf2 = subset(starwars,eye_color == "blue")

newdfactual = merge(newdf1, newdf2, by="name")

View(newdfactual)
```



newdf | newdfactual | Filter

	name	height.x	mass.x	hair_color.x	skin_color.x	eye_color.x	birth_year.x	sex.x	gender.x	homeworld.x
4	Tarfful	234	136	brown	brown	blue	NA	male	masculine	Kashyyyk
3	Owen Lars	178	120	brown, grey	light	blue	52	male	masculine	Tatooine
1	Chewbacca	228	112	brown	unknown	blue	200	male	masculine	Kashyyyk
2	Jek Tono Porkins	180	110	brown	fair	blue	NA	male	masculine	Bestine IV

2B.

```
> humanData = subset(starwars,species == "Human")
> nonhumanData = subset(starwars,species != "Human")

df <- data.frame("Height" = c(mean(humanData$height,na.rm=TRUE),
mean(nonhumanData$height,na.rm=TRUE)),"Mass" =
c(mean(humanData$mass,na.rm=TRUE), mean(nonhumanData$mass,na.rm=TRUE)))

rownames(df) = c("Height","Mass")
columnnames(df) = c("Human","Nonhuman")

> df
          Human  Nonhuman
Height 176.6452  82.78182
Mass   172.4043 107.56111
```

2C.

```
df = subset(starwars, grepl("Revenge of the Sith", starwars$films))
> df
# A tibble: 34 × 14
   name               height  mass hair_color skin_…¹ eye_c…² birth…³ sex
gender homew…⁴ species films vehic…⁵ stars…⁶
   <chr>               <int> <dbl> <chr>      <chr>   <chr>      <dbl> <chr>
<chr>  <chr>   <chr>   <lis> <list>  <list>
 1 Luke Skywalker        172    77 blond      fair    blue        19   male
mascu… Tatooi… Human   <chr> <chr>   <chr>
 2 C-3PO                 167    75 NA         gold    yellow     112   none
mascu… Tatooi… Droid   <chr> <chr>   <chr>
 3 R2-D2                  96    32 NA         white,… red         33   none
mascu… Naboo   Droid   <chr> <chr>   <chr>
 4 Darth Vader           202   136 none       white   yellow      41.9 male
mascu… Tatooi… Human   <chr> <chr>   <chr>
 5 Leia Organa           150    49 brown      light   brown       19   fema…
femin… Aldera… Human   <chr> <chr>   <chr>
 6 Owen Lars             178   120 brown, gr… light   blue        52   male
mascu… Tatooi… Human   <chr> <chr>   <chr>
 7 Beru Whitesun lars    165    75 brown      light   blue        47   fema…
femin… Tatooi… Human   <chr> <chr>   <chr>
 8 Obi-Wan Kenobi        182    77 auburn, w… fair    blue-g…     57   male
mascu… Stewjon Human   <chr> <chr>   <chr>
 9 Anakin Skywalker      188    84 blond      fair    blue        41.9 male
mascu… Tatooi… Human   <chr> <chr>   <chr>
10 Wilhuff Tarkin        180    NA auburn, g… fair    blue        64   male
mascu… Eriadu  Human   <chr> <chr>   <chr>
```

humanMass | df2part1 | df

Filter

	name	height	mass	hair_color	skin_color	eye_color	birth_year	sex	gender	homeworld	species	films
1	Luke Skywalker	172	77.0	blond	fair	blue	19.0	male	masculine	Tatooine	Human	c("The Empire Strikes Back
2	C-3PO	167	75.0	NA	gold	yellow	112.0	none	masculine	Tatooine	Droid	c("The Empire Strikes Back
3	R2-D2	96	32.0	NA	white, blue	red	33.0	none	masculine	Naboo	Droid	c("The Empire Strikes Back
4	Darth Vader	202	136.0	none	white	yellow	41.9	male	masculine	Tatooine	Human	c("The Empire Strikes Back
5	Leia Organa	150	49.0	brown	light	brown	19.0	female	feminine	Alderaan	Human	c("The Empire Strikes Back
6	Owen Lars	178	120.0	brown, grey	light	blue	52.0	male	masculine	Tatooine	Human	c("Attack of the Clones", "F
7	Beru Whitesun lars	165	75.0	brown	light	blue	47.0	female	feminine	Tatooine	Human	c("Attack of the Clones", "F
8	Obi-Wan Kenobi	182	77.0	auburn, white	fair	blue-gray	57.0	male	masculine	Stewjon	Human	c("The Empire Strikes Back
9	Anakin Skywalker	188	84.0	blond	fair	blue	41.9	male	masculine	Tatooine	Human	c("Attack of the Clones", "T
10	Wilhuff Tarkin	180	NA	auburn, grey	fair	blue	64.0	male	masculine	Eriadu	Human	c("Revenge of the Sith", "A
11	Chewbacca	228	112.0	brown	unknown	blue	200.0	male	masculine	Kashyyyk	Wookiee	c("The Empire Strikes Back
12	Yoda	66	17.0	white	green	brown	896.0	male	masculine	NA	Yoda's species	c("The Empire Strikes Back
13	Palpatine	170	75.0	grey	pale	yellow	82.0	male	masculine	Naboo	Human	c("The Empire Strikes Back

2D.

```
x = c(sum(is.na(starwars$name))
/length((starwars$name)),sum(is.na(starwars$height))
/length((starwars$height)),sum(is.na(starwars$hair_color))
/length((starwars$hair_color)),sum(is.na(starwars$skin_color))
/length((starwars$skin_color)),sum(is.na(starwars$eye_color))
```

```
/length((starwars$eye_color)),sum(is.na(starwars$birth_year))
/length((starwars$birth_year)),
+      +       sum(is.na(starwars$sex))
/length((starwars$sex)),sum(is.na(starwars$gender))
/length((starwars$gender)),sum(is.na(starwars$homeworld))
/length((starwars$homeworld)),sum(is.na(starwars$species))
/length((starwars$species)),sum(is.na(starwars$films))
/length((starwars$films)),sum(is.na(starwars$vehicles))
/length((starwars$vehicles)),sum(is.na(starwars$starships))
/length((starwars$starships)))
> x
x
 [1] 0.00000000 0.06896552 0.05747126 0.00000000 0.00000000 0.50574713
0.04597701 0.04597701 0.11494253 0.04597701
[11] 0.00000000 0.00000000 0.00000000
```

3A.

```
> x <- sample(c(1,3,5,7,11,13), size = 50, replace = TRUE)
> x
 [1]  1  3  7  5  5  5  7  3  5 11 11  5  7 13 11 11  5 11 11  3 13 11  3 13  3
11  7  5  3  3  5 13 11 13  5  1  1  1
[39]  1  7 11 13  5  3  1  7  5  3  1  1
```

3B.

```
for (k in 1:100) {
+    x <- rpois(n=(k*100), lambda = 2)
+    print(mean(x))
+ }
[1] 2.04
[1] 1.895
[1] 1.87
[1] 1.9725
[1] 2.126
[1] 2.053333
[1] 1.991429
[1] 1.98875
[1] 1.99
[1] 2.032
[1] 1.938182
[1] 2.048333
[1] 2.040769
[1] 1.971429
[1] 2.054667
[1] 1.959375
[1] 1.982941
[1] 2.013333
[1] 1.928421
```

[1] 1.9865
[1] 1.971429
[1] 2.017727
[1] 1.93087
[1] 2.029583
[1] 1.9864
[1] 2.044231
[1] 1.976667
[1] 1.963214
[1] 1.995172
[1] 1.971667
[1] 1.992581
[1] 2.025625
[1] 2.037273
[1] 2.021176
[1] 1.992857
[1] 2.032222
[1] 1.97027
[1] 2.001579
[1] 2.023333
[1] 1.99325
[1] 2.009756
[1] 1.98619
[1] 2.005349
[1] 1.997955
[1] 2.000222
[1] 2.030217
[1] 1.969574
[1] 2.014792
[1] 1.992857
[1] 1.989
[1] 2.012157
[1] 1.989808
[1] 1.98283
[1] 1.990185
[1] 1.976
[1] 1.966964
[1] 1.987018
[1] 2.020517
[1] 2.008136
[1] 2.0065
[1] 1.995246
[1] 1.998387
[1] 2.011587
[1] 1.9925
[1] 2.010462
[1] 1.990758

```
[1] 1.992836
[1] 2.007794
[1] 1.984348
[1] 2.001286
[1] 1.983239
[1] 1.986528
[1] 2.000548
[1] 2.006081
[1] 1.985333
[1] 1.999474
[1] 1.993117
[1] 1.990641
[1] 2.018608
[1] 2.03225
[1] 2.021975
[1] 2.003049
[1] 2.012651
[1] 2.02119
[1] 1.996235
[1] 1.98593
[1] 2.005172
[1] 2.004545
[1] 2.003483
[1] 1.985
[1] 1.997912
[1] 1.9975
[1] 1.983548
[1] 1.993617
[1] 2.017789
[1] 2.005625
[1] 1.998866
[1] 2.016633
[1] 2.011919
[1] 1.9988
Mean seems to be approaching the lambda value which is 2.
```