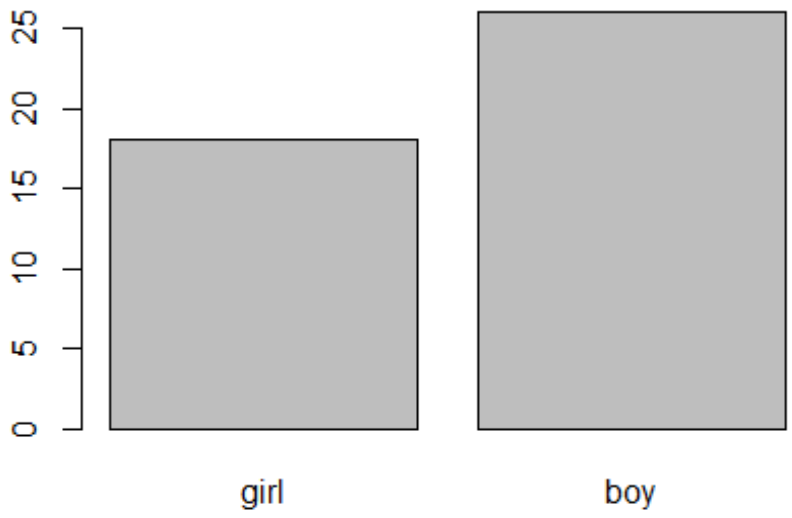
Suite Correction Liste#2

Exercice 3:

1.Gender: categorial

Weight: integer

```
data(babyboom)
typeof(babyboom$gender)

## [1] "integer"

typeof(babyboom$wt)

## [1] "double"

Sum=summary(babyboom$gender)
Sum

## girl  boy
##   18   26

barplot(Sum)
```

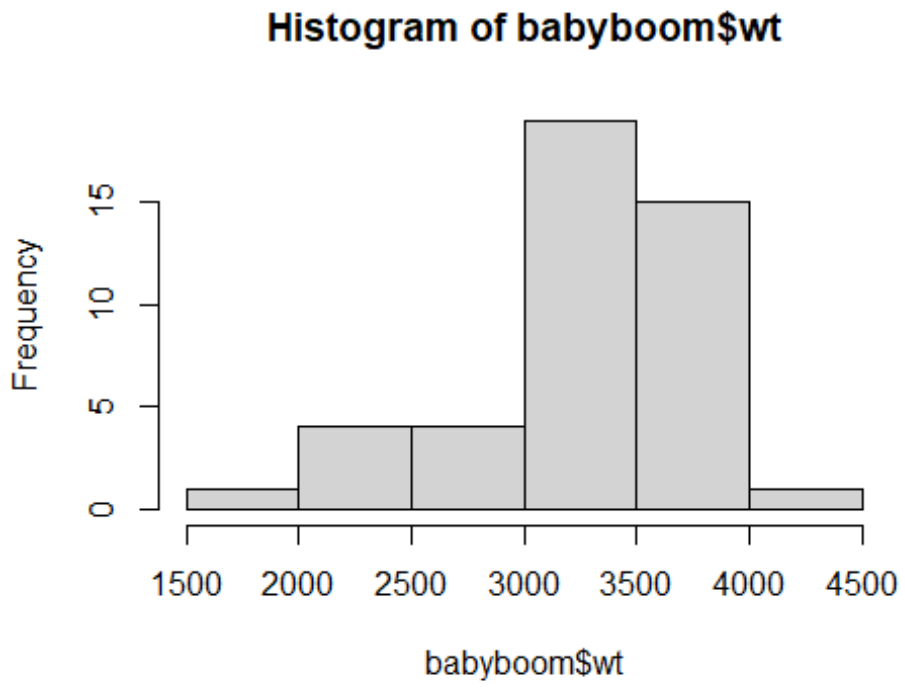



```
#View(babyboom)
```

```
summary(babyboom)
```

```
##    clock.time      gender         wt        running.time
##  Min.   :   5.0   girl:18   Min.   :1745   Min.   :   5.0
##  1st Qu.: 792.8   boy :26   1st Qu.:3142   1st Qu.: 482.8
##  Median :1406.5             Median :3404   Median : 846.5
##  Mean   :1296.0             Mean   :3276   Mean   : 788.7
##  3rd Qu.:1918.5             3rd Qu.:3572   3rd Qu.:1158.5
##  Max.   :2355.0             Max.   :4162   Max.   :1435.0
```

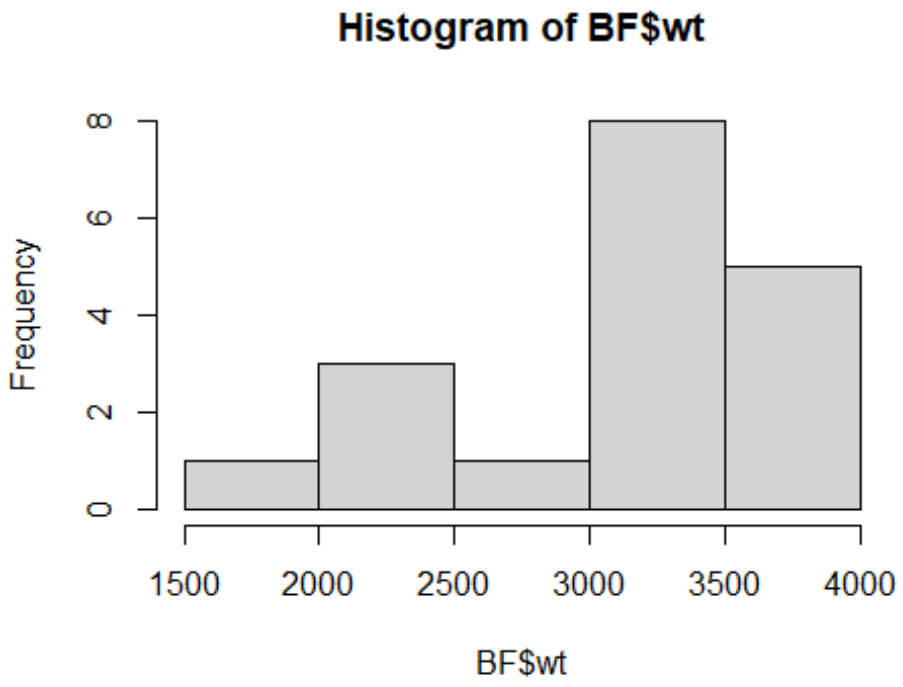
```
hist(babyboom$wt)
```




```
BF=babyboom[which(babyboom$gender=="girl"),]
BF
```

```
##    clock.time gender   wt running.time
## 1           5   girl 3837            5
## 2         104   girl 3334           64
## 6         405   girl 2208          245
## 7         407   girl 1745          247
## 13        814   girl 2576          494
## 14        909   girl 3208          549
## 16       1049   girl 3746          649
## 17       1053   girl 3523          653
## 22       1406   girl 3430          846
## 23       1407   girl 3480          847
## 24       1433   girl 3116          873
```

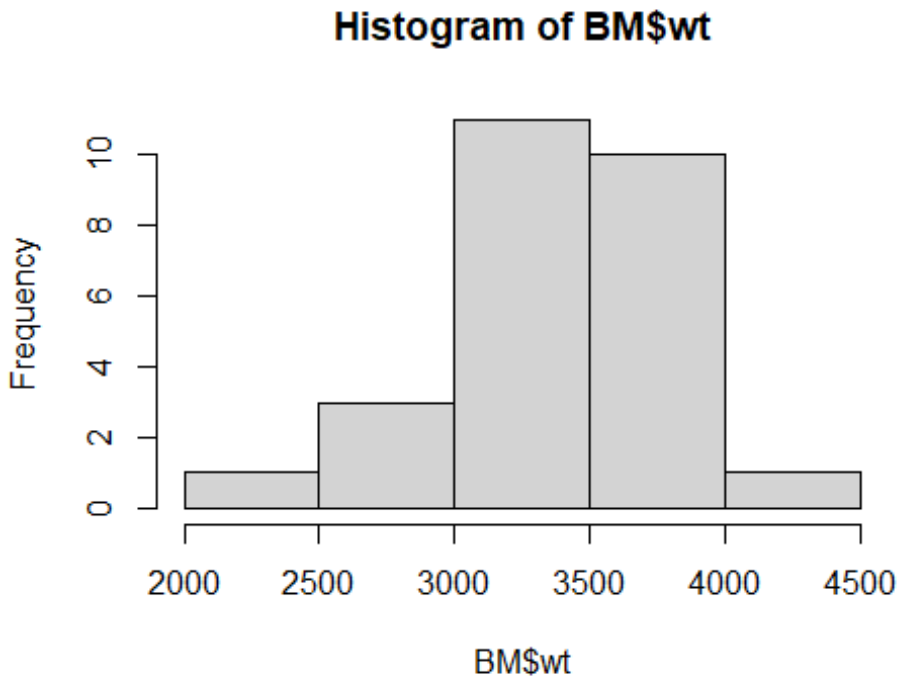
```
## 25       1446   girl 3428          886
## 29       1742   girl 2184         1062
## 31       1825   girl 2383         1105
## 37       2010   girl 3500         1210
## 42       2217   girl 3866         1337
## 43       2327   girl 3542         1407
## 44       2355   girl 3278         1435

hist(BF$wt)
```




```
BM=babyboom[which(babyboom$gender=="boy"),]
BM

##    clock.time gender   wt running.time
## 3         118    boy 3554           78
## 4         155    boy 3838          115
## 5         257    boy 3625          177
## 8         422    boy 2846          262
## 9         431    boy 3166          271
## 10        708    boy 3520          428
## 11        735    boy 3380          455
## 12        812    boy 3294          492
## 15       1035    boy 3521          635
## 18       1133    boy 2902          693
## 19       1209    boy 2635          729
## 20       1256    boy 3920          776
## 21       1305    boy 3690          785
```

```
## 26       1514    boy 3783          914
## 27       1631    boy 3345          991
## 28       1657    boy 3034         1017
## 30       1807    boy 3300         1087
## 32       1854    boy 3428         1134
## 33       1909    boy 4162         1149
## 34       1947    boy 3630         1187
## 35       1949    boy 3406         1189
## 36       1951    boy 3402         1191
## 38       2037    boy 3736         1237
## 39       2051    boy 3370         1251
## 40       2104    boy 2121         1264
## 41       2123    boy 3150         1283
```

```
hist(BM$wt)
```




```
boxplot(wt ~ gender, data = babyboom, col = "lightgray")
```


wt
4000
3000
2000
girl
boy
gender

Exercice 4:

1) X Le nombre de naissance de garçon

$X \sim Bino\left(\frac{1}{2}, n = 44\right)$

P(d'obtenir au moin 26 enf de même genre)

$= P($26g .... 44g ou 26f .... 44g$)$

$= 1 - P($(19g; 25f); (20g; 24f); (21g; 23g); (22g; 22g); (23g; 21f); (24g; 20f); (25g; 19f)$)$

$= 1 - \sum_{i=19}^{25} P(19 \leq X \leq 25)$

$= 1 - \sum_{i=19}^{25} (0.5)^{44-i} (0.5)^{i} \binom{44}{i}$

2) nbre de naissance jusqu'à garçon

N_j

$N \sim Geom(p)$

Estimation de p utilisant methode de moment:

$E(X) = 22/13$; $\hat{p} = 13/22$

$P(X = k) = (1 - \hat{p})^{k} \hat{p}$

nb naissance jusqu'à la naissance d'un garçon	fréq.	probabilité empirique	probabilité théorique
1	18	18/26	13/22
2	3	3/26	117/484
3	4	4/26	1053/10648
4	0	0	0.040
5+	1	1/26	0.02
total	26	100%	100&

3) nombre de naissance par heure.

$N_1 \sim Pois(\lambda)$

mean = 11/6 ; $\hat{\lambda}$ = 11/6

nb naissance par heure	fréq.	probabilité empirique	probabilité théorique
0	3	1/8	0.16
1	8	1/3	0.29
2	6	1/4	0.26
3	4	1/16	0.16
4	3	1/8	0.07
5+	0	0	0.22
total	24	100%	100&

4. temps entre arrive $T \sim \exp(\lambda)$

$\text{mean} = \frac{\sum c_i e_i}{n} = 29.39$

$\hat{\lambda}_1 = 0.34$

temps entre arrivées	fréq.	probabilité empirique	probabilité théorique
$[0, 19.5)$	18	0.42	0.47
$[19.5, 39)$	12	0.27	0.26
$[39, 58.5)$	5	0.116	0.129
$[58.5, 78)$	6	0.14	0.066
78+	2	0.046	0.075
total	43	100%	100%