

5. Tables in R

5.1. Making a table

From a vector

```
> country=c("J","C","J","C","A","A","J","C")
> table(country)
country
A C J
2 3 3
```

From a matrix

```
> xtabs(~pet$sex+pet$pet)
      pet$pet
pet$sex  cat dog
female   7   3
male     4   6
```

5.2. Extracting data from a matrix

```
> pet[1:2,]
      sex pet year
1 female cat    3
2 female cat    8
> pet[,2]
[1] cat cat cat cat dog cat cat cat dog dog dog dog dog cat
cat dog dog
[18] dog cat cat
Levels: cat dog
> pet[1:3,2:3]
      pet year
1 cat    3
2 cat    8
3 cat    7

> pet[pet$pet=="dog",]
```

#Be careful of the double equals

TRY Use != for extraction.

Alternative way

```
> subset(pet, pet=="dog")
```

5.3. Sorting

Sorting a vector

```
> sort(country)
[1] "A" "A" "C" "C" "C" "J" "J" "J"
*Note that the data itself is not changed.
> country
[1] "J" "C" "J" "C" "A" "A" "J" "C"
```

If you want a sorted data try the following:

```
> country=sort(country)
```

Sorting a matrix

```
> pet.p=pet[order(pet$pet),]
> head(pet.p)
      sex pet year
1 female cat    3
2 female cat    8
3 female cat    7
4 female cat    5
6 female cat    9
7 female cat    6
```

-Adding second condition

```
> pet.p2=pet[order(pet$pet,pet$year),]
> head(pet.p2)
      sex pet year
1  female cat    3
4  female cat    5
14  male  cat    5
19  male  cat    5
7  female cat    6
15  male  cat    6
```

TRY Sort by year.

Decreasing order

```
> pet[order(pet$year,decreasing=TRUE),]
```

5.4. Calculating on the matrix

Proportion on a table

```
> pet.xtabs=xtabs(~pet$sex+pet$pet)
```

```
> prop.table(pet.xtabs)
```

```
      pet$pet
pet$sex  cat  dog
female 0.35 0.15
male   0.20 0.30
```

Try Put the following command and see the difference.

```
> prop.table(pet.xtabs, 1)
```

```
> prop.table(pet.xtabs, 2)
```

Mean of each factor

```
> tapply(pet$year,pet$sex,mean)
```

```
female  male
 6.5     8.7
```

```
> aggregate(pet$year,list(pet$sex),mean)
```

```
Group.1  x
1 female 6.5
2  male 8.7
```

Mean of each factor by combination

```
> tapply(pet$year,list(pet$sex,pet$pet),mean)
```

```
      cat      dog
female 7.00  5.333333
male   6.25 10.333333
```

```
> aggregate(pet$year,list(pet$sex,pet$pet),mean)
```

```
Group.1 Group.2      x
1 female    cat  7.000000
2  male    cat  6.250000
3 female   dog  5.333333
4  male   dog 10.333333
```

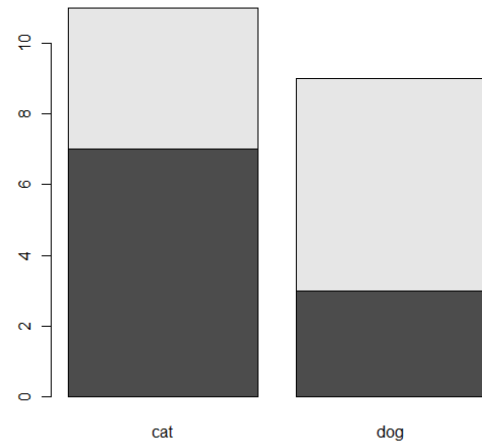
TRY What is the difference between *tapply* and *aggregate*?

Try to put three factors in the list using *pet2* data.

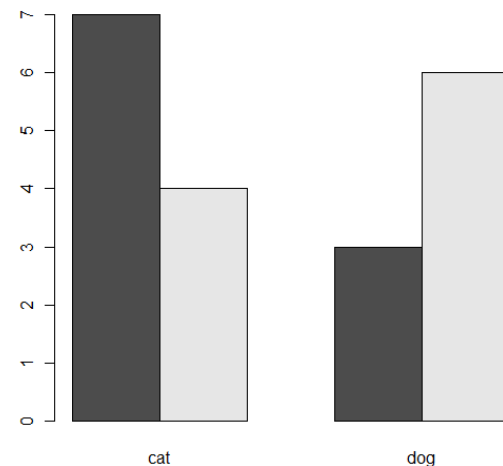
5.5 Making graphs

Barplot

```
> barplot(pet.xtabs)
```



```
> barplot(pet.xtabs, beside=TRUE)
```



Mosaic plot

```
> pet2=read.delim("clipboard",header=TRUE)
```

```
> pet2.xtabs=xtabs(~pet2$sex+pet2$pet+pet2$country)
```

```
> pet2.xtabs
```

```
, , pet2$country = America
```

```
      pet2$pet
pet2$sex cat  dog
female  1    1
male    1    4
```

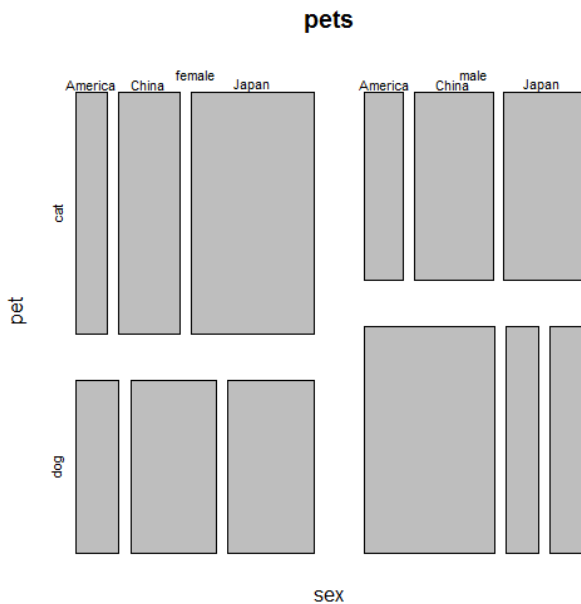
```
, , pet2$country = China
```

```
      pet2$pet
pet2$sex cat dog
female  2   2
male    2   1
```

```
, , pet2$country = Japan
```

```
      pet2$pet
pet2$sex cat dog
female  4   2
male    2   1
```

```
> mosaicplot(pet2.xtabs,main="pets",ylab="pet",xlab="sex")
```



Appendix

Data <http://realize.jounin.jp/R.html>

```
pet
sex    pet    year
female cat     3
female cat     8
female cat     7
female cat     5
female dog     9
female cat     9
```

```
female cat     6
female cat    11
female dog     2
female dog     5
male dog    11
male dog     6
male dog    11
male cat     5
male cat     6
male dog    12
male dog    10
male dog    12
male cat     5
male cat     9
```

```
pet2
sex    pet    year    country
female cat     3    Japan
female cat     8    Japan
female cat     7    China
female cat     5    China
female dog     9    America
female cat     9    America
female cat     6    Japan
female cat    11    Japan
female dog     2    China
female dog     5    China
male dog    11    America
male dog     6    America
male dog    11    Japan
male cat     5    Japan
male cat     6    China
male dog    12    China
male dog    10    America
male dog    12    America
male cat     5    Japan
male cat     9    China
male cat     9    America
female dog     9    Japan
female dog     3    Japan
```