Summarization I

Preliminaries

Load Necessary Packages

```
> library(FSA)      # for filterD(), hist(), Summarize()
> library(dplyr)    # for mutate()
```

Load Data

```
> # Set your working directory to where your external data files (and scripts) are located.
> setwd("C:/aaaWork/Web/GitHub/RcourseNunavut2016/Handouts")
> dSC <- read.csv("SawyerCo_reduced.csv")
> names(dSC)
 [1] "waterbody" "year"      "mon"       "gear"      "species"   "len"       "weight"    "sex"
 [9] "age"       "age_strux" "lennote"
```

```
> dSC <- mutate(dSC,sex=mapvalues(sex,from="",to="ND"),fyear=factor(year))
> levels(dSC$waterbody)
 [1] "BLACK DAN LAKE"  "CHIPPEWA RIVER"  "CONNORS LAKE"    "GRINDSTONE LAKE" "HUNTER LAKE"
 [6] "LAKE CHETAC"     "LAKE CHIPPEWA"   "MOSQUITO BROOK"  "NAMEKAGON RIVER" "NELSON LAKE"
[11] "SAND LAKE"
```

```
> levels(dSC$species)
 [1] "Black Crappie"      "Bluegill"           "Brook Trout"        "Brown Trout"
 [5] "Lake Sturgeon"      "Largemouth Bass"    "Muskellunge"        "Northern Pike"
 [9] "Pumpkinseed"        "Rock Bass"          "Shorthead Redhorse" "Smallmouth Bass"
[13] "Walleye"            "White Sucker"       "Yellow Perch"
```

```
> LChip_WAE <- filterD(dSC,waterbody=="LAKE CHIPPEWA",species=="Walleye")
> LChip_WAE11 <- filterD(LChip_WAE,year==2011)
```

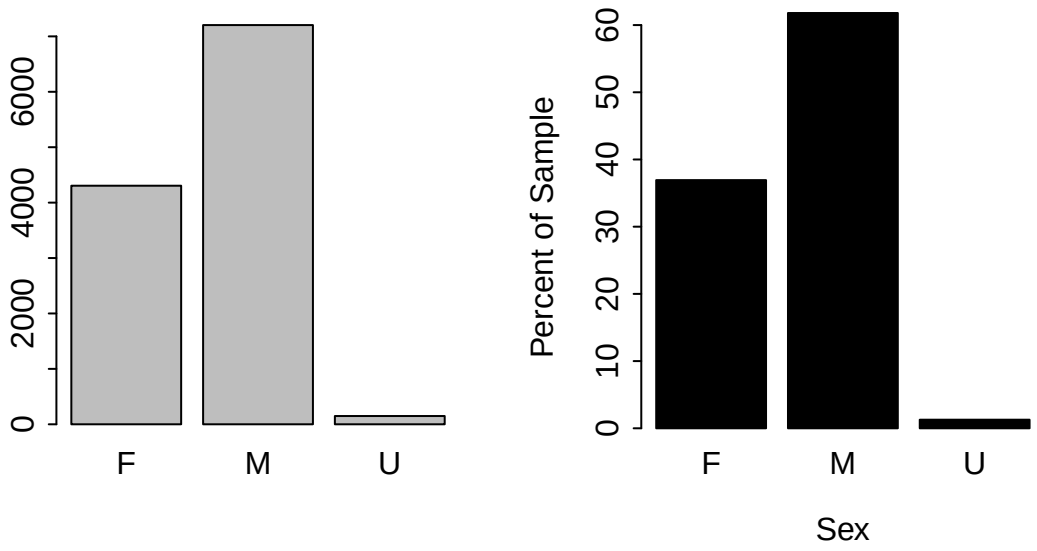
Univariate Summaries – Categorical Variables

```
> ( t_sex <- xtabs(~sex,data=LChip_WAE11) )
sex
  ND    F    M    U
1750 4305 7204  149
```

```
> ( t_sex1 <- t_sex[-1] )
sex
   F    M    U
4305 7204  149
```

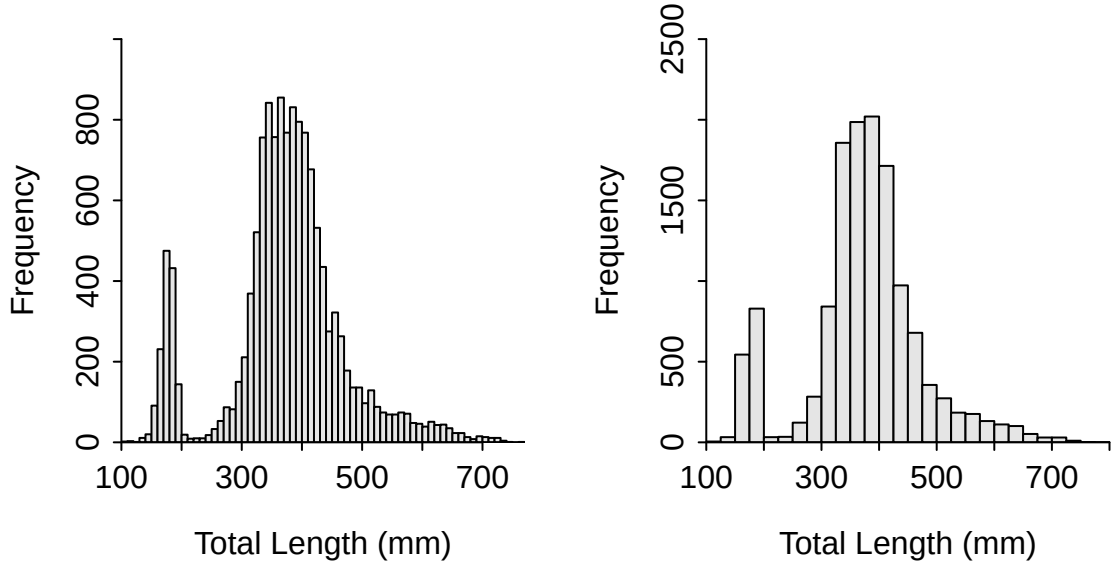
```
> ( tp_sex1 <- prop.table(t_sex1)*100 )
sex
        F         M         U
36.927432 61.794476  1.278092
```

```
> barplot(t_sex1)  # Left
> barplot(tp_sex1,xlab="Sex",ylab="Percent of Sample",ylim=c(0,60),col="black")  # Right
```



Univariate Summaries – Quantitative Variables

```
> hist(~len,data=LChip_WAE11,xlab="Total Length (mm)",ylim=c(0,1000),w=10)  # Left
> hist(~len,data=LChip_WAE11,xlab="Total Length (mm)",ylim=c(0,2500),breaks=seq(100,800,25))  # Right
```




```
> Summarize(~len,data=LChip_WAE11,digits=1)
       n   nvalid     mean       sd      min       Q1   median       Q3      max percZero
 13408.0  13408.0    374.0     98.8    104.0    333.0    376.0    422.0    767.0      0.0
```

Bivariate Summaries – Categorical Variables

```
> ( t_seas <- xtabs(~mon+fyear,data=LChip_WAE) )
     fyear
mon    2010  2011  2012  2013  2014
  Apr   205 11658    48     0     0
  May   175     0   109   182   327
  Sep     0  1750    29    85   418
```

```
> round(prop.table(t_seas,margin=2)*100,1)
     fyear
mon   2010 2011 2012 2013 2014
  Apr 53.9 86.9 25.8  0.0  0.0
  May 46.1  0.0 58.6 68.2 43.9
  Sep  0.0 13.1 15.6 31.8 56.1
```

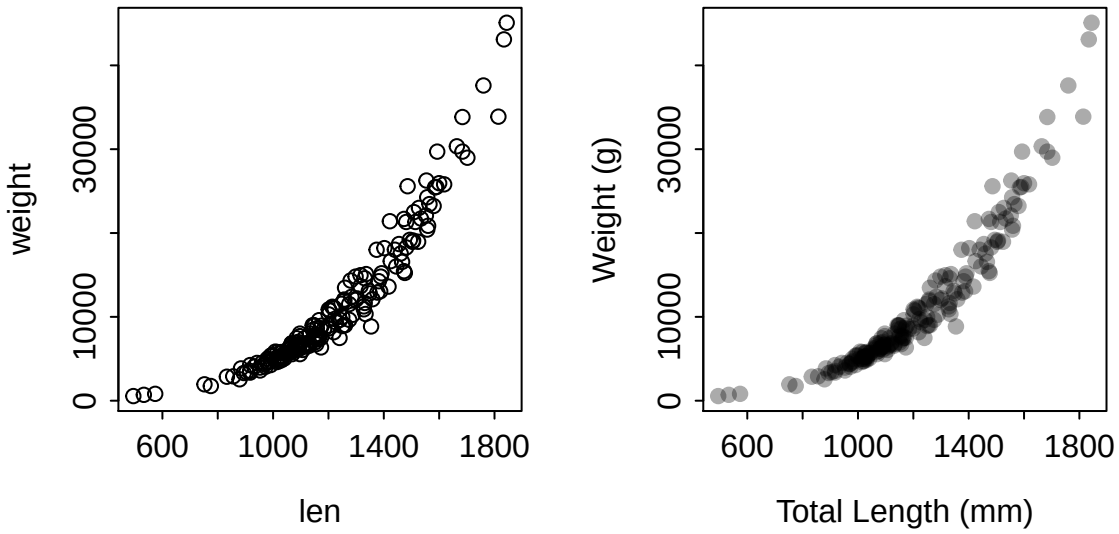
```
> round(prop.table(t_seas,margin=1)*100,1)
     fyear
mon   2010 2011 2012 2013 2014
  Apr  1.7 97.9  0.4  0.0  0.0
  May 22.1  0.0 13.7 23.0 41.2
  Sep  0.0 76.7  1.3  3.7 18.3
```

```
> round(prop.table(t_seas)*100,1)
     fyear
mon   2010 2011 2012 2013 2014
  Apr  1.4 77.8  0.3  0.0  0.0
  May  1.2  0.0  0.7  1.2  2.2
  Sep  0.0 11.7  0.2  0.6  2.8
```

Bivariate Summaries – Quantitative Variables

```
> Sturg <- filterD(dSC,species=="Lake Sturgeon",waterbody %in% c("CHIPPEWA RIVER","HUNTER LAKE"))
```

```
> plot(weight~len,data=Sturg) # Left
> plot(weight~len,data=Sturg,pch=19,col=col2rgbt("black",1/3),
      ylab="Weight (g)",xlab="Total Length (mm)")  # Right
```




```
> with(Sturg,cor(weight,len))
[1] NA
```

```
> with(Sturg,cor(weight,len,use="pairwise.complete.obs"))
[1] 0.9303562
```

```
> with(Sturg,cor(weight,len,use="pairwise.complete.obs",method="spearman"))
[1] 0.981568
```