DEMO2002 Code Shortcuts

Remove "+" from Cohort column

```
fx$Cohort = gsub("[+]", "", fx$Cohort)
```

ggplot boilerplate/guidance

```r
ggplot()+
  geom_line(LT_p[LT_p$Age==0,], mapping =aes(x=Year, y=ex, color="e(0) at age 0"))+
  scale_x_continuous(n.breaks = 10)+
  scale_y_continuous(breaks = seq(0,110,10),limits = c(0,100))+
  scale_color_manual(values = c("navy","red"))+
  guides(color = guide_legend(title = "Year"))+
  labs(x = "Age", y = "lx", title="This is a title")+
  theme_bw()
```

Life Table

```r
LifeTableMx<-function(mx,sex){
  # and mx would just be age-specific deaths/pop
  ### N is the number of ages that we have or length(mx)
  N<-length(mx)

  # person years lived by those dying in the interval
  ax<-rep(0.5, N)

  ## for the first age ax  depends on infant mortality and sex
  if(sex=="m"){
    ax[1]<-ifelse(mx[1]<0.107,0.045+mx[1]*2.684,0.330)}
  if(sex=="f"){
    ax[1]<-ifelse(mx[1]<0.107,0.053+2.800*mx[1],0.350)
  }

  ## transform from death rates to probabilities of dying
  qx<- mx / (1 + (1 - ax) * mx)
  ### with the last value of qx = 1
  qx[N] <- 1
  ## Probability of surviving
  px<- 1 - qx
  ## calculating the survival function
  lx<-100000
  for(y in 1:(N-1)){
    lx[y+1]<-lx[y]*px[y]
  }
  ## the distribution of deaths
  dx<- qx * lx
  ## the life tables person-years depends on lx, dx and ax
  Lx<- (lx - dx) + ax * dx
  ## and Lx for the last age-group
  Lx[N]<-ifelse(mx[N]>0,mx[N],0)
  ## person-years from a given age upwards
  Tx<-c()
  for(y in 1:N){
    Tx[y]<- sum(Lx[y:N])
  }
  ## finally life expectancy
  ex<- Tx / lx
  Age<-0:110
  # ALL<-data.frame(Age,mx,lx,dx,Lx,Tx,ex)
  ALL<-data.frame(Age, mx, qx, ax, lx, dx, Lx, Tx, ex)
  return(ALL)
}
```

Focus Points

1. Always connect demographic measures to their real-world implications
2. Include more policy-relevant interpretations
3. Consider historical and social context when analyzing trends
4. Strengthen technical explanations with concrete examples
5. Make better use of the word limit - some answers could be more detailed while staying within 200 words