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# Assignment-2 Report

## OSEMN REPORT

### 1) Introduction:

National Football League is professional american football league. There are 32 teams divided between National Football Conference and American Football Conference. Chicago Bear is American Football team. Bears have won nine NFL championships. The club was established by the A. E. Staley food starch company of Decatur, Illinois in 1919. This is the unsorted data which is there on the Quandl for the NFL Chicago bears team. It is the record of team from 1966 to 2014 on the basis of certain criteria such as points, ptso etc.

### 2) Data Section:

The data is fetched from Quandl by downloading R library by the command given below. The data is trimmed from 1966 to 2014 for analysis. Then the data is scrubbed as we want only Year, Wins, Points, Ptso variables for further analysis. Then we form a new data frame data.new which contains column 1 to column 7 and again a new data frame data.all is formed in which column's 1,2,6,7 are concatenated by the command shown in the code chunk below.

```
library(Quandl)

data<-Quandl("PROFB/NFL_CHICAGOBears", trim_start="1966-12-31", trim_end="2014-12-31", authcode="rajx8UA92cYx4iJtHiF9")
head(data)
```

| ##   | Year       | Wins | Losses | Ties | W-L%  | Points | Pts0 | Pt  | Diff | MoV  | SoS  | SRS |
|------|------------|------|--------|------|-------|--------|------|-----|------|------|------|-----|
| ## 1 | 2014-12-31 | 0    | 1      | 0    | 0.000 | 20     | 23   | -3  | -3.0 | 3.0  | 0.0  |     |
| ## 2 | 2013-12-31 | 8    | 8      | 0    | 0.500 | 445    | 478  | -33 | -2.1 | -2.1 | -4.1 |     |
| ## 3 | 2012-12-31 | 10   | 6      | 0    | 0.625 | 375    | 277  | 98  | 6.1  | 0.8  | 6.9  |     |
| ## 4 | 2011-12-31 | 8    | 8      | 0    | 0.500 | 353    | 341  | 12  | 0.8  | 0.9  | 1.7  |     |
| ## 5 | 2010-12-31 | 11   | 5      | 0    | 0.688 | 334    | 286  | 48  | 3.0  | 1.1  | 4.1  |     |
| ## 6 | 2009-12-31 | 7    | 9      | 0    | 0.438 | 327    | 375  | -48 | -3.0 | -0.9 | -3.9 |     |
| ##   | OSRS       | DSRS |        |      |       |        |      |     |      |      |      |     |
| ## 1 | 0.0        | 0.0  |        |      |       |        |      |     |      |      |      |     |
| ## 2 | 3.0        | -7.1 |        |      |       |        |      |     |      |      |      |     |
| ## 3 | 1.0        | 6.0  |        |      |       |        |      |     |      |      |      |     |
| ## 4 | -1.5       | 3.1  |        |      |       |        |      |     |      |      |      |     |
| ## 5 | -0.6       | 4.7  |        |      |       |        |      |     |      |      |      |     |
| ## 6 | -1.9       | -2.0 |        |      |       |        |      |     |      |      |      |     |

```
data.new<-as.data.frame(data[1:49,1:7])
head(data.new,50)
```

| ##    | Year       | Wins | Losses | Ties | W-L%  | Points | Pts0 |
|-------|------------|------|--------|------|-------|--------|------|
| ## 1  | 2014-12-31 | 0    | 1      | 0    | 0.000 | 20     | 23   |
| ## 2  | 2013-12-31 | 8    | 8      | 0    | 0.500 | 445    | 478  |
| ## 3  | 2012-12-31 | 10   | 6      | 0    | 0.625 | 375    | 277  |
| ## 4  | 2011-12-31 | 8    | 8      | 0    | 0.500 | 353    | 341  |
| ## 5  | 2010-12-31 | 11   | 5      | 0    | 0.688 | 334    | 286  |
| ## 6  | 2009-12-31 | 7    | 9      | 0    | 0.438 | 327    | 375  |
| ## 7  | 2008-12-31 | 9    | 7      | 0    | 0.563 | 375    | 350  |
| ## 8  | 2007-12-31 | 7    | 9      | 0    | 0.438 | 334    | 348  |
| ## 9  | 2006-12-31 | 13   | 3      | 0    | 0.813 | 427    | 255  |
| ## 10 | 2005-12-31 | 11   | 5      | 0    | 0.688 | 260    | 202  |
| ## 11 | 2004-12-31 | 5    | 11     | 0    | 0.313 | 231    | 331  |
| ## 12 | 2003-12-31 | 7    | 9      | 0    | 0.438 | 283    | 346  |
| ## 13 | 2002-12-31 | 4    | 12     | 0    | 0.250 | 281    | 379  |
| ## 14 | 2001-12-31 | 13   | 3      | 0    | 0.813 | 338    | 203  |
| ## 15 | 2000-12-31 | 5    | 11     | 0    | 0.313 | 216    | 355  |
| ## 16 | 1999-12-31 | 6    | 10     | 0    | 0.375 | 272    | 341  |
| ## 17 | 1998-12-31 | 4    | 12     | 0    | 0.250 | 276    | 368  |
| ## 18 | 1997-12-31 | 4    | 12     | 0    | 0.250 | 263    | 421  |
| ## 19 | 1996-12-31 | 7    | 9      | 0    | 0.438 | 283    | 305  |
| ## 20 | 1995-12-31 | 9    | 7      | 0    | 0.563 | 392    | 360  |
| ## 21 | 1994-12-31 | 9    | 7      | 0    | 0.563 | 271    | 307  |
| ## 22 | 1993-12-31 | 7    | 9      | 0    | 0.438 | 234    | 230  |

|       |            |    |    |         |     |     |
|-------|------------|----|----|---------|-----|-----|
| ## 23 | 1992-12-31 | 5  | 11 | 0 0.313 | 295 | 361 |
| ## 24 | 1991-12-31 | 11 | 5  | 0 0.688 | 299 | 269 |
| ## 25 | 1990-12-31 | 11 | 5  | 0 0.688 | 348 | 280 |
| ## 26 | 1989-12-31 | 6  | 10 | 0 0.375 | 358 | 377 |
| ## 27 | 1988-12-31 | 12 | 4  | 0 0.750 | 312 | 215 |
| ## 28 | 1987-12-31 | 11 | 4  | 0 0.733 | 356 | 282 |
| ## 29 | 1986-12-31 | 14 | 2  | 0 0.875 | 352 | 187 |
| ## 30 | 1985-12-31 | 15 | 1  | 0 0.938 | 456 | 198 |
| ## 31 | 1984-12-31 | 10 | 6  | 0 0.625 | 325 | 248 |
| ## 32 | 1983-12-31 | 8  | 8  | 0 0.500 | 311 | 301 |
| ## 33 | 1982-12-31 | 3  | 6  | 0 0.333 | 141 | 174 |
| ## 34 | 1981-12-31 | 6  | 10 | 0 0.375 | 253 | 324 |
| ## 35 | 1980-12-31 | 7  | 9  | 0 0.438 | 304 | 264 |
| ## 36 | 1979-12-31 | 10 | 6  | 0 0.625 | 306 | 249 |
| ## 37 | 1978-12-31 | 7  | 9  | 0 0.438 | 253 | 274 |
| ## 38 | 1977-12-31 | 9  | 5  | 0 0.643 | 255 | 253 |
| ## 39 | 1976-12-31 | 7  | 7  | 0 0.500 | 253 | 216 |
| ## 40 | 1975-12-31 | 4  | 10 | 0 0.286 | 191 | 379 |
| ## 41 | 1974-12-31 | 4  | 10 | 0 0.286 | 152 | 279 |
| ## 42 | 1973-12-31 | 3  | 11 | 0 0.214 | 195 | 334 |
| ## 43 | 1972-12-31 | 4  | 9  | 1 0.321 | 225 | 275 |
| ## 44 | 1971-12-31 | 6  | 8  | 0 0.429 | 185 | 276 |
| ## 45 | 1970-12-31 | 6  | 8  | 0 0.429 | 256 | 261 |
| ## 46 | 1969-12-31 | 1  | 13 | 0 0.071 | 210 | 339 |
| ## 47 | 1968-12-31 | 7  | 7  | 0 0.500 | 250 | 333 |
| ## 48 | 1967-12-31 | 7  | 6  | 1 0.538 | 239 | 218 |
| ## 49 | 1966-12-31 | 5  | 7  | 2 0.417 | 234 | 272 |

```
data.all<-data.new[c(1,2,6,7)]
```

```
data.all
```

| ##    | Year       | Wins | Points | Pts0 |
|-------|------------|------|--------|------|
| ## 1  | 2014-12-31 | 0    | 20     | 23   |
| ## 2  | 2013-12-31 | 8    | 445    | 478  |
| ## 3  | 2012-12-31 | 10   | 375    | 277  |
| ## 4  | 2011-12-31 | 8    | 353    | 341  |
| ## 5  | 2010-12-31 | 11   | 334    | 286  |
| ## 6  | 2009-12-31 | 7    | 327    | 375  |
| ## 7  | 2008-12-31 | 9    | 375    | 350  |
| ## 8  | 2007-12-31 | 7    | 334    | 348  |
| ## 9  | 2006-12-31 | 13   | 427    | 255  |
| ## 10 | 2005-12-31 | 11   | 260    | 202  |
| ## 11 | 2004-12-31 | 5    | 231    | 331  |
| ## 12 | 2003-12-31 | 7    | 283    | 346  |
| ## 13 | 2002-12-31 | 4    | 281    | 379  |
| ## 14 | 2001-12-31 | 13   | 338    | 203  |
| ## 15 | 2000-12-31 | 5    | 216    | 355  |
| ## 16 | 1999-12-31 | 6    | 272    | 341  |
| ## 17 | 1998-12-31 | 4    | 276    | 368  |
| ## 18 | 1997-12-31 | 4    | 263    | 421  |
| ## 19 | 1996-12-31 | 7    | 283    | 305  |
| ## 20 | 1995-12-31 | 9    | 392    | 360  |
| ## 21 | 1994-12-31 | 9    | 271    | 307  |
| ## 22 | 1993-12-31 | 7    | 234    | 230  |
| ## 23 | 1992-12-31 | 5    | 295    | 361  |
| ## 24 | 1991-12-31 | 11   | 299    | 269  |
| ## 25 | 1990-12-31 | 11   | 348    | 280  |
| ## 26 | 1989-12-31 | 6    | 358    | 377  |
| ## 27 | 1988-12-31 | 12   | 312    | 215  |
| ## 28 | 1987-12-31 | 11   | 356    | 282  |
| ## 29 | 1986-12-31 | 14   | 352    | 187  |
| ## 30 | 1985-12-31 | 15   | 456    | 198  |
| ## 31 | 1984-12-31 | 10   | 325    | 248  |
| ## 32 | 1983-12-31 | 8    | 311    | 301  |
| ## 33 | 1982-12-31 | 3    | 141    | 174  |
| ## 34 | 1981-12-31 | 6    | 253    | 324  |
| ## 35 | 1980-12-31 | 7    | 304    | 264  |
| ## 36 | 1979-12-31 | 10   | 306    | 249  |
| ## 37 | 1978-12-31 | 7    | 253    | 274  |
| ## 38 | 1977-12-31 | 9    | 255    | 253  |
| ## 39 | 1976-12-31 | 7    | 253    | 216  |
| ## 40 | 1975-12-31 | 4    | 191    | 379  |
| ## 41 | 1974-12-31 | 4    | 152    | 279  |
| ## 42 | 1973-12-31 | 3    | 195    | 334  |
| ## 43 | 1972-12-31 | 4    | 225    | 275  |
| ## 44 | 1971-12-31 | 6    | 185    | 276  |

```
## 45 1970-12-31    6    256 261
## 46 1969-12-31    1    210 339
## 47 1968-12-31    7    250 333
## 48 1967-12-31    7    239 218
## 49 1966-12-31    5    234 272
```

```
str(data.all)
```

```
## 'data.frame':      49 obs. of  4 variables:
## $ Year   : Date, format: "2014-12-31" "2013-12-31" ...
## $ Wins   : num  0 8 10 8 11 7 9 7 13 11 ...
## $ Points: num  20 445 375 353 334 327 375 334 427 260 ...
## $ Pts0   : num  23 478 277 341 286 375 350 348 255 202 ...
```

```
class(data.all)
```

```
## [1] "data.frame"
```

```
summary(data.all)
```

```
##      Year              Wins              Points              Pts0
## Min.   :1966-12-31  Min.    : 0.00  Min.    : 20  Min.    : 23
## 1st Qu.:1978-12-31  1st Qu.: 5.00  1st Qu.:239  1st Qu.:253
## Median :1990-12-31  Median : 7.00  Median :281  Median :282
## Mean   :1990-12-31  Mean   : 7.41  Mean   :284  Mean   :292
## 3rd Qu.:2002-12-31  3rd Qu.:10.00  3rd Qu.:334  3rd Qu.:346
## Max.   :2014-12-31  Max.   :15.00  Max.   :456  Max.   :478
```

### 3)Result Section

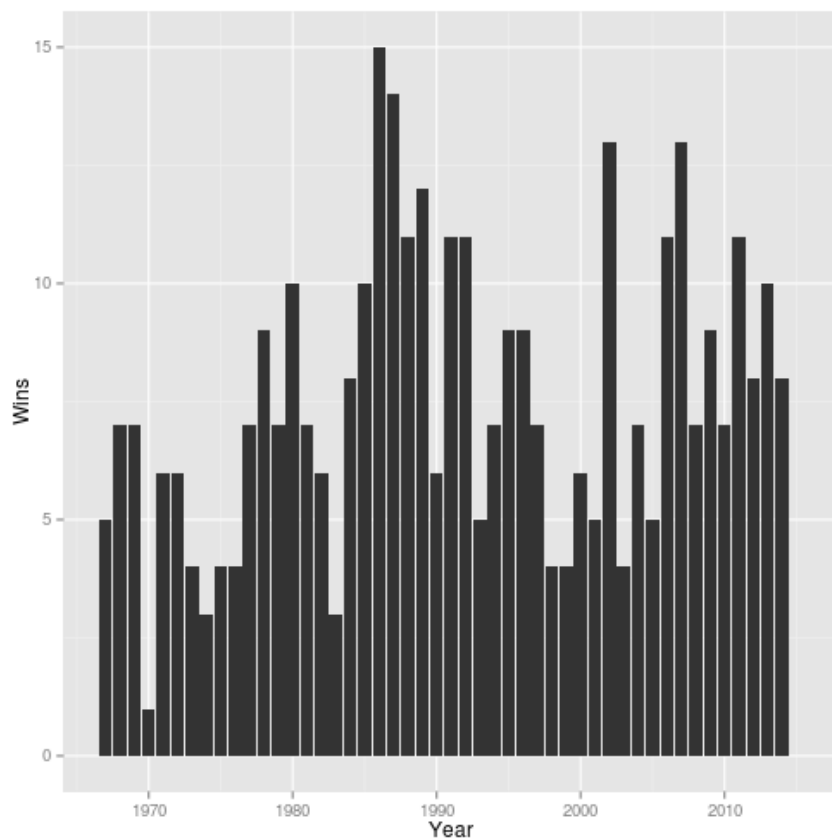
"ggplot2" is a plotting system for R, based on the grammar of graphics, which tries to take the good parts of base and lattice graphics and none of the bad parts

#### 3.1 Bar Graph-(Year,Wins)

Here we plot a bar graph of Year(x-axis) against the Wins(y-axis) which demonstrates the number of matches won by chicago bears per season from 1966 to 2014. Chicago bears had won just 1 match in 1969 and 15 is the highest number of matches it won in the season of 1985.

```
library(ggplot2)
```

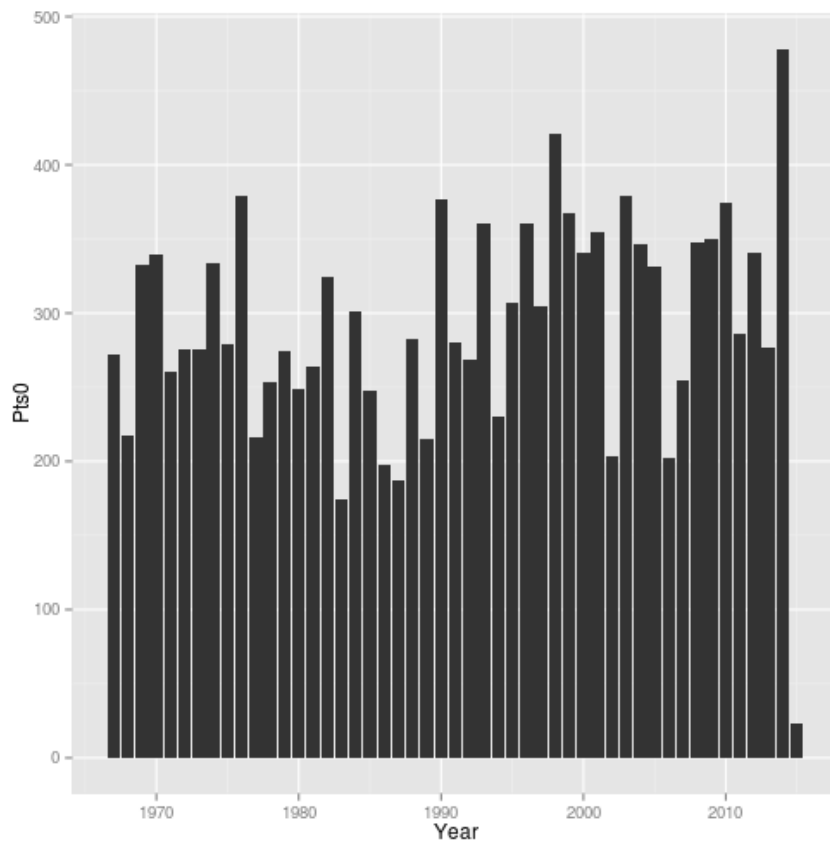
```
ggplot(data=data.new,aes(x=Year,y=Wins))+
  geom_bar(stat='Identity')
```



### 3.2 Bar Graph(Year,Pts0)

Here we plot a bar graph of Year(x-axis) against the Points of Opponents(Pts0->y-axis) which demonstrates the number of points scored by opponent teams per season against chicago bears from 1966 to 2014. The opponents had scored highest number points as total against chicago bears which was 478 in 2013 and 174 was lowest scored in 1982 season.

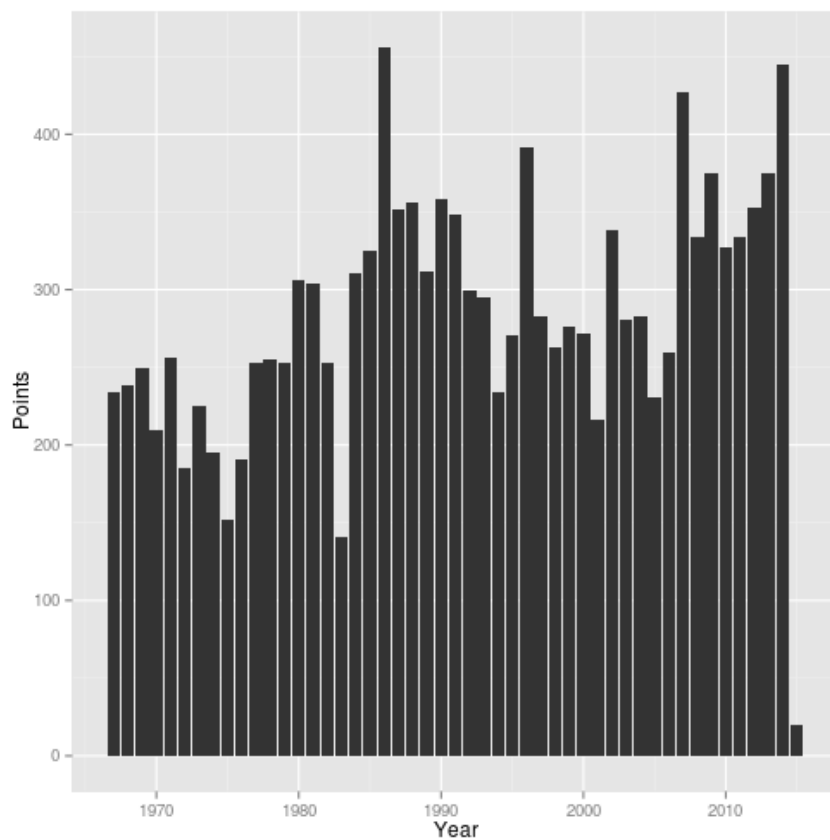
```
ggplot(data=data.all,aes(x=Year,y=Pts0))+
  geom_bar(stat='Identity')
```



### 3.3 Bar Graph(Year,Points)

Here we plot a bar graph of Year(x-axis) against the Points(y-axis) which demonstrates the number of points scored by Chicago Bears per season against opponents from 1966 to 2014. Chicago Bears had scored. They had scored their highest total of 456 points in 1985 and lowest total of 141 points in 1982.

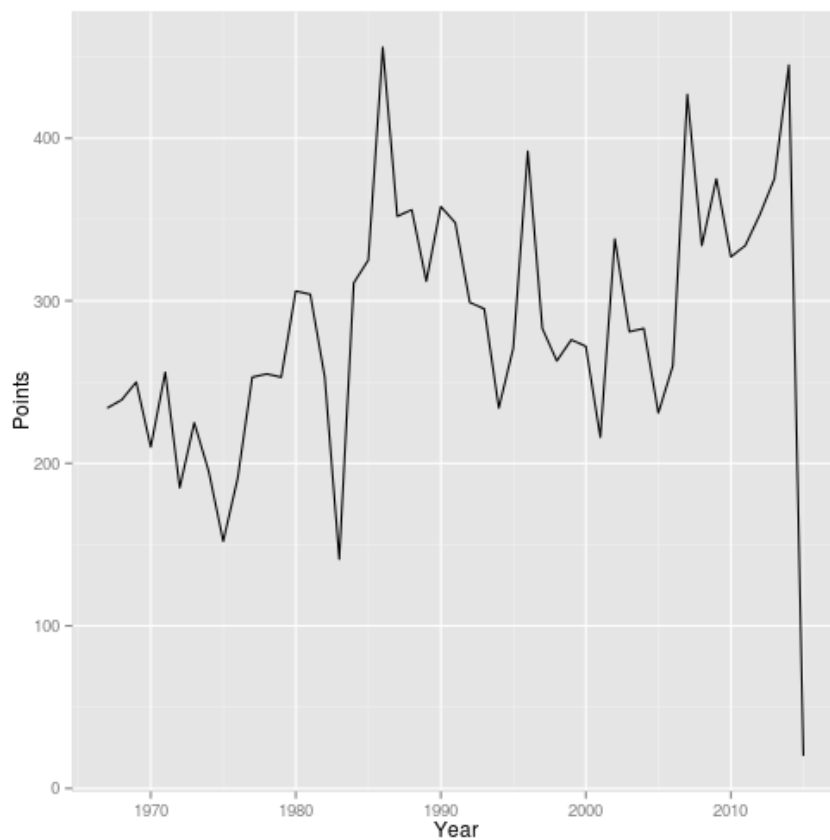
```
ggplot(data=data.all,aes(x=Year,y=Points))+
  geom_bar(stat='Identity')
```



### 3.4 Line Graph(Year,Points)

Here we plot a line graph of year(x-axis) against the Points(y-axis) which demonstrates the number of points scored by Chicago bears per season from 1966 to 2014. Chicago bears had scored. They had scored their highest total of 456 points in 1985 and lowest total of 141 points in 1982.

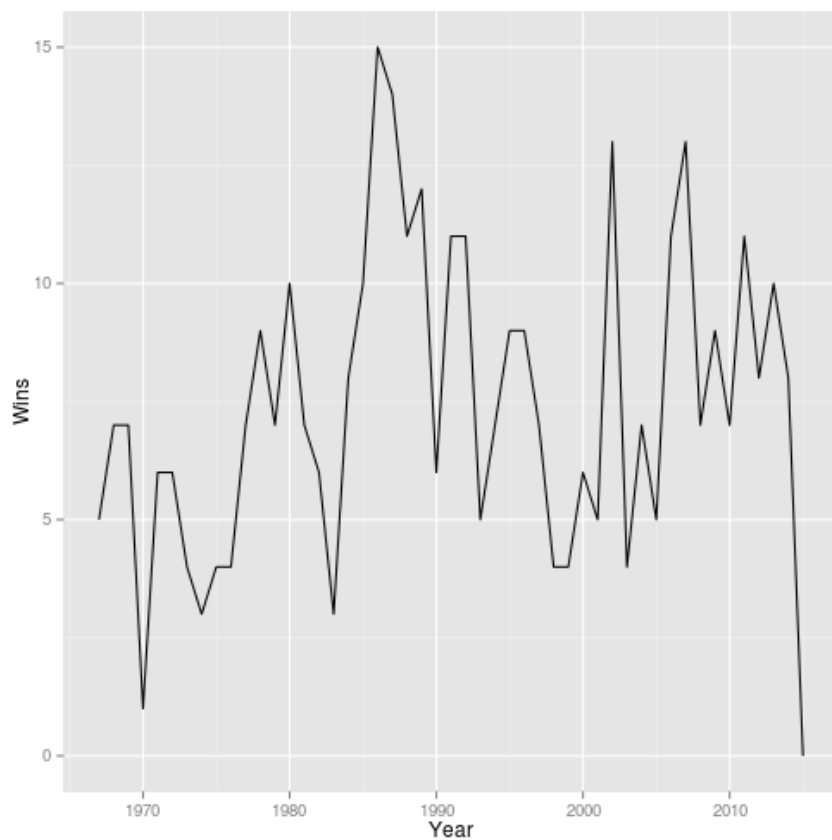
```
ggplot(data=data.all,aes(x=Year,y=Points,group=1))+geom_line()
```



### 3.5 Line Graph(Year,Wins)

Here we plot a line graph of year(x-axis) against the Wins(y-axis) which demonstrates the number of matches won by Chicago Bears per season from 1966 to 2014. Chicago Bears had won just 1 match in 1969 and 15 is the highest number of matches it won in the season of 1985.

```
ggplot(data=data.all, aes(x=Year, y=Wins, group=1)) + geom_line()
```



### 3.6 Line Graph(Year,Pts0)

Here we plot a line graph graph of year(x-axis) against the Points of Opponents(pts0->y-axis) which demonstrates the number of points scored by opponent teams per season against chicago bears from 1966 to 2014. The opponents had scored highest number points as total against chicago bears which was 478 in 2013 and 174 was lowest scored in 1982 season.

```
ggplot(data=data.all, aes(x=Year, y=Pts0, group=1)) + geom_line()
```



