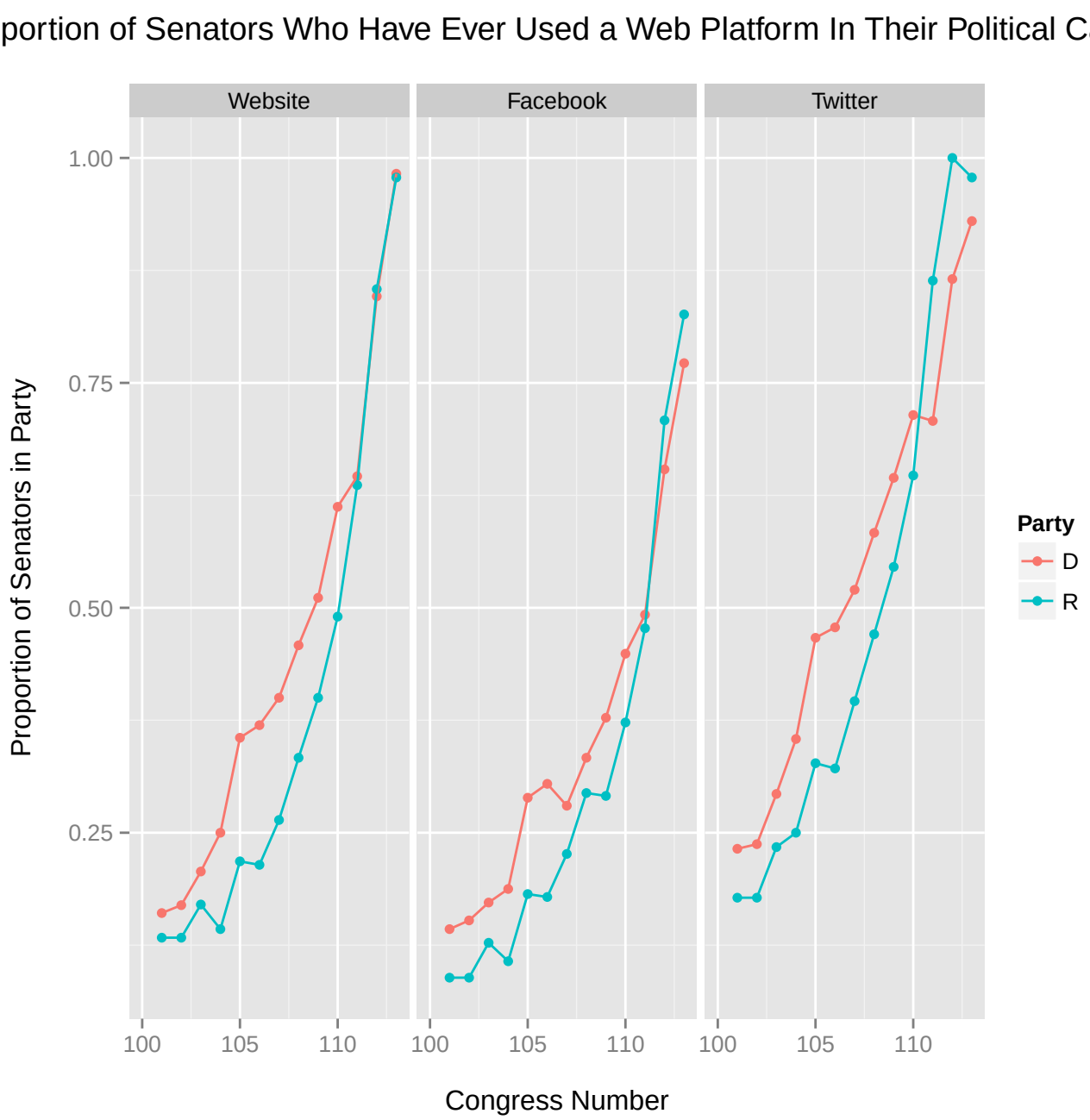
Analyzing Roll Call Votes from the US Senate

Jordan Poles

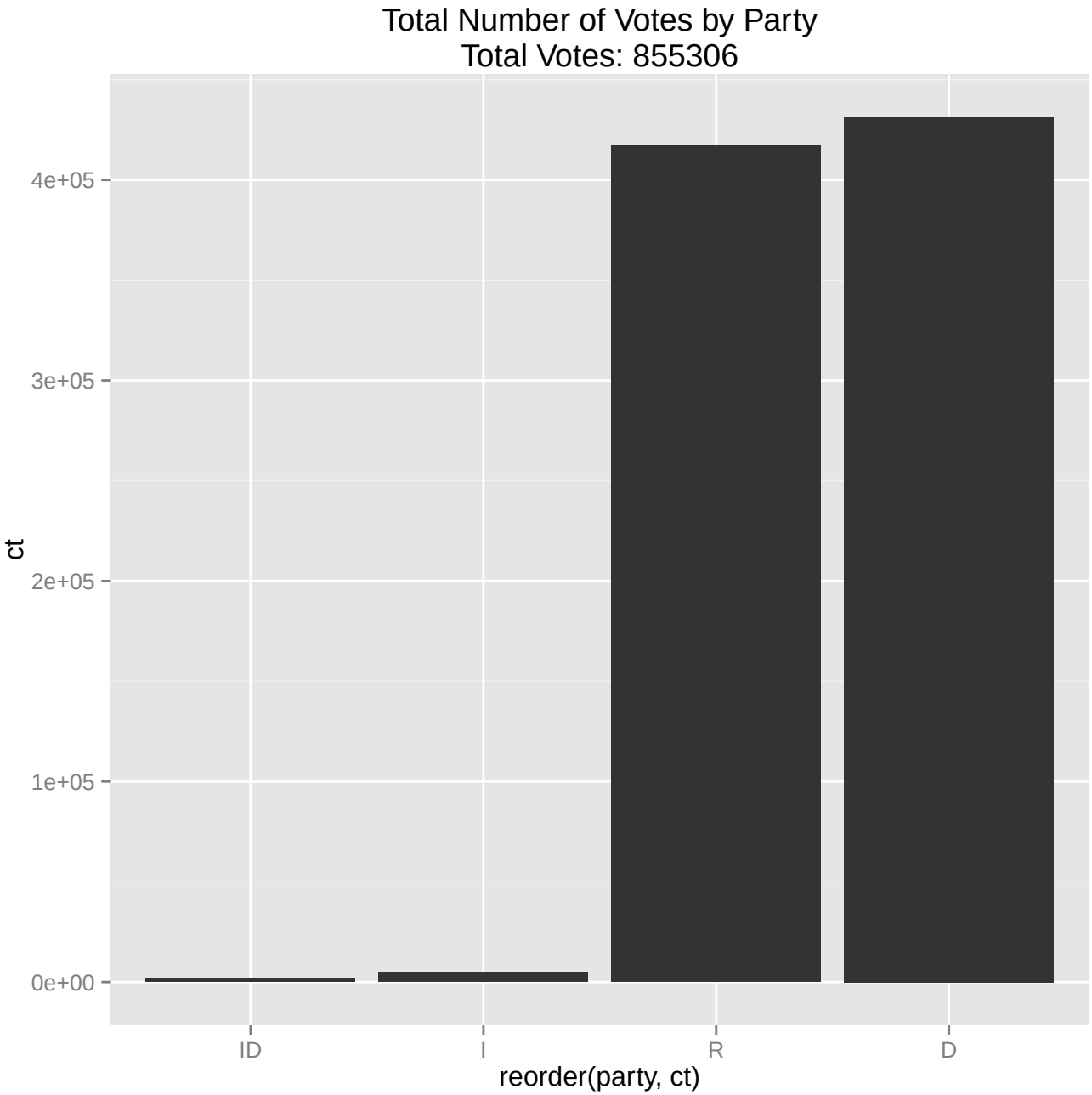
November 22, 2015

```
#Setting up libraries and imports
  require(RSQLite)

## Loading required package:  RSQLite
## Loading required package:  DBI

  require(ggplot2)

## Loading required package:  ggplot2

  require(grid)

## Loading required package:  grid

  require(reshape2)

## Loading required package:  reshape2

  source("../config.R")
  source("../voteAnalysis.R")
```

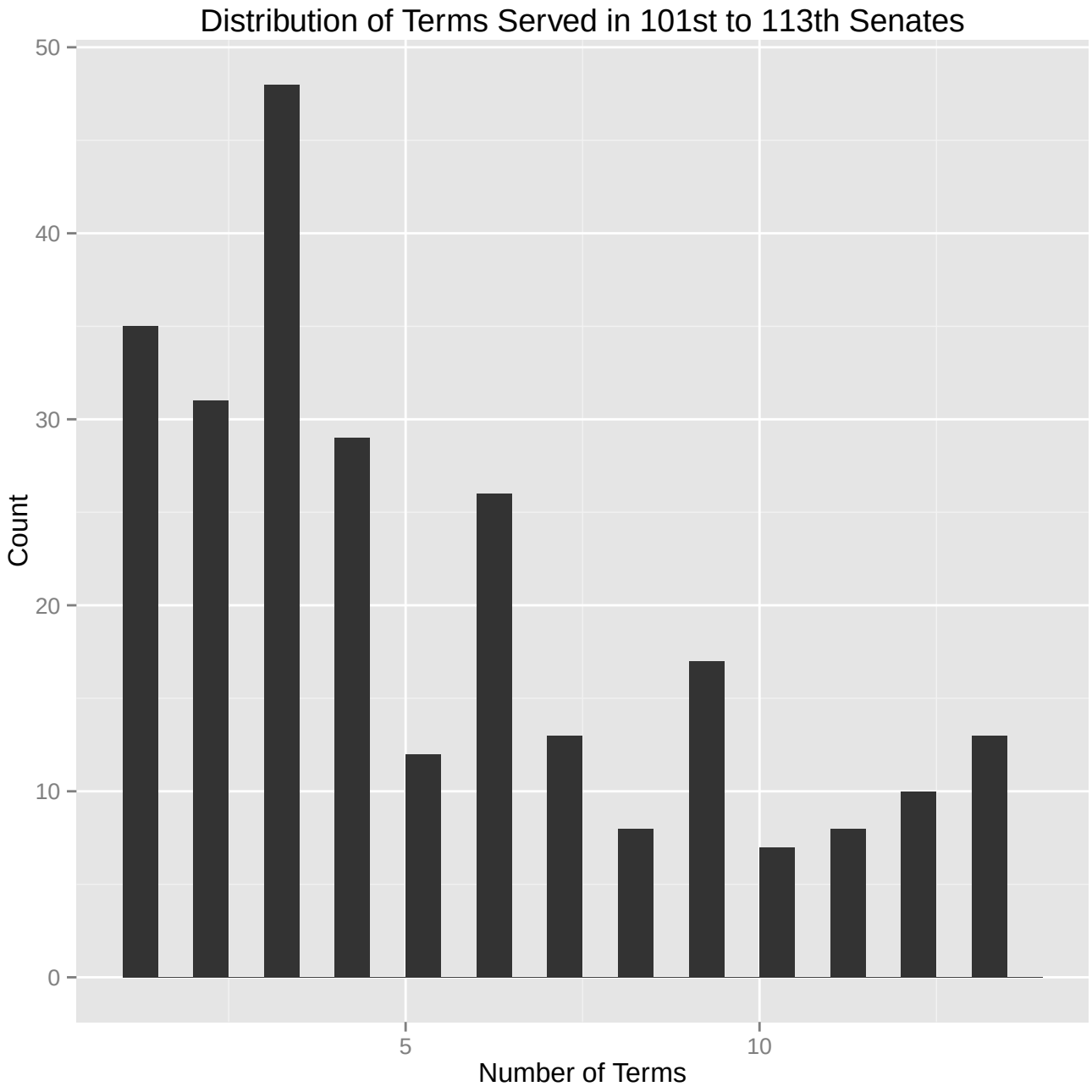
```
websiteCt = queryDB("SELECT party as Party, congressNumber, count(*) as webct FROM members WHERE URL!='' AND P
twitterCt = queryDB("SELECT party as Party, congressNumber, count(*) as twitterct FROM members WHERE twitter_a
fbCt = queryDB("SELECT party as Party, congressNumber, count(*) as fbct FROM members WHERE facebook_account!='
totalCt = queryDB("SELECT party as Party, congressNumber, count(*) as totalct FROM members WHERE Party!='I' GR
mediaCt = merge(websiteCt, twitterCt, by=c("Party", "congressNumber"))
mediaCt = merge(mediaCt, fbCt, by=c("Party", "congressNumber"))
mediaCt = merge(mediaCt, totalCt, by=c("Party", "congressNumber"))
mediaCt$Website = mediaCt$webct/mediaCt$totalct
mediaCt$Twitter = mediaCt$twitterct/mediaCt$totalct
mediaCt$Facebook = mediaCt$fbct/mediaCt$totalct
mediaPlotData = melt(mediaCt, measure.vars = c("Website", "Facebook", "Twitter"), id.vars = c("Party", "congre
ggplot(mediaPlotData, aes(x=congressNumber, y=value, color=Party))+geom_point()+geom_line()+facet_wrap(~variab
```



```
query = "SELECT party, count(*) as ct FROM votes GROUP BY party"
partyVoteTotals = queryDB(query, "data.sqlite")
ggplot(partyVoteTotals, aes(x = reorder(party, ct), y = ct)) + geom_bar(stat = "identity") +
    ggtitle(sprintf("Total Number of Votes by Party\nTotal Votes: %s", sum(partyVoteTotals$ct)))
```

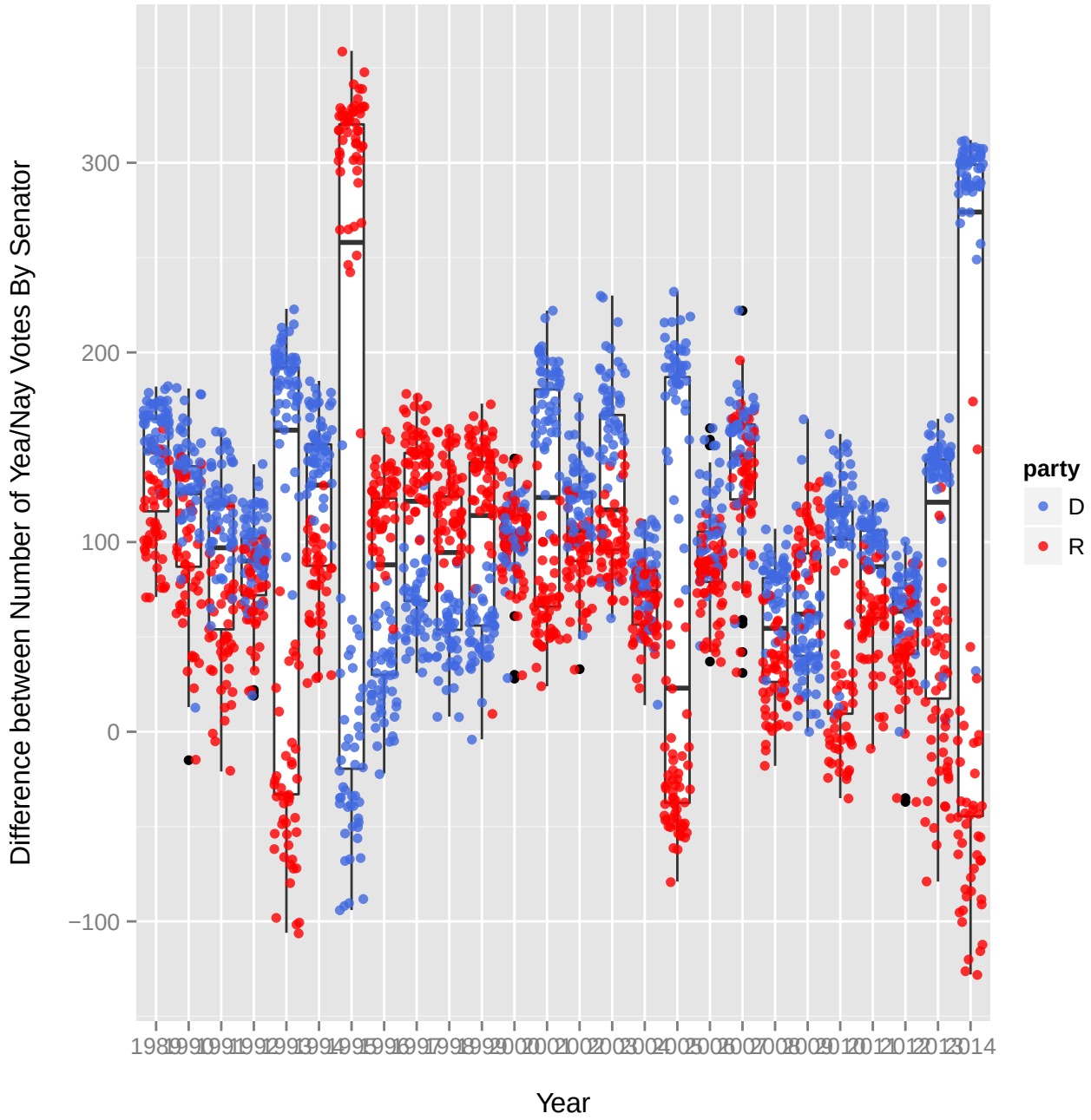


```
query = "SELECT id, first_name, last_name, party, seniority, count(*) AS ct FROM members GROUP BY id ORDER BY ct
senatorTotals = queryDB(query, "data.sqlite")
ggplot(senatorTotals, aes(x = ct)) + xlim(1, 14) + geom_bar(binwidth = 0.5) +
    xlab("Number of Terms") + ylab("Count") + ggtitle("Distribution of Terms Served in 101st to 113th Senates")
```

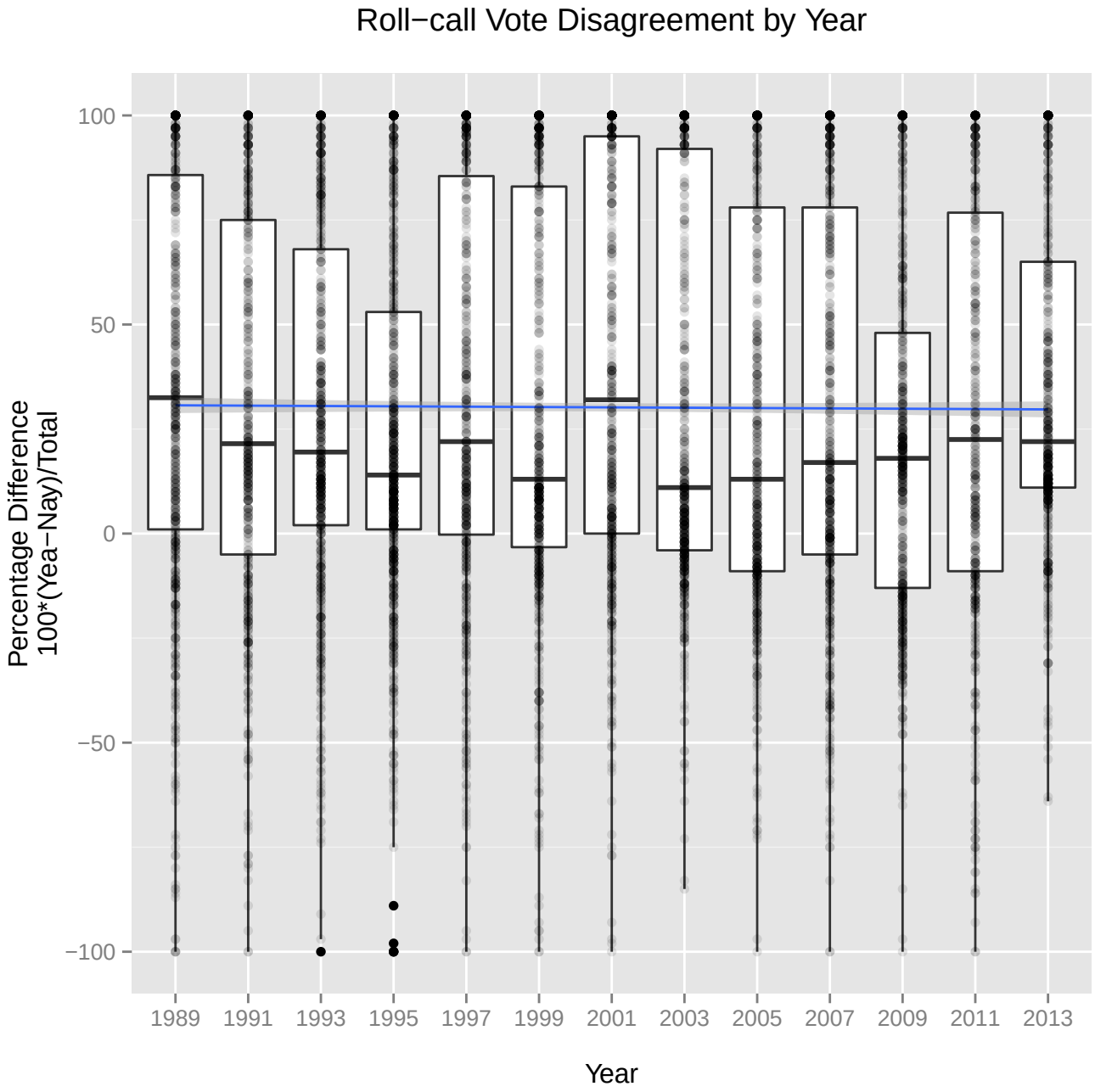


```
  votedata = queryDB("SELECT id, party, vote, count(*) as ct, year FROM votes WHERE party in ('D', 'R') GROUP BY
  votedatawide = dcast(votedata, id+year+party~vote, value.var="ct")
  votedatawide$diff = (votedatawide$Yea-votedatawide$Nay)
  ggplot(votedatawide, aes(x=year, y=diff))+geom_boxplot()+geom_jitter(aes(color=party), alpha=.8)+scale_color_m
```

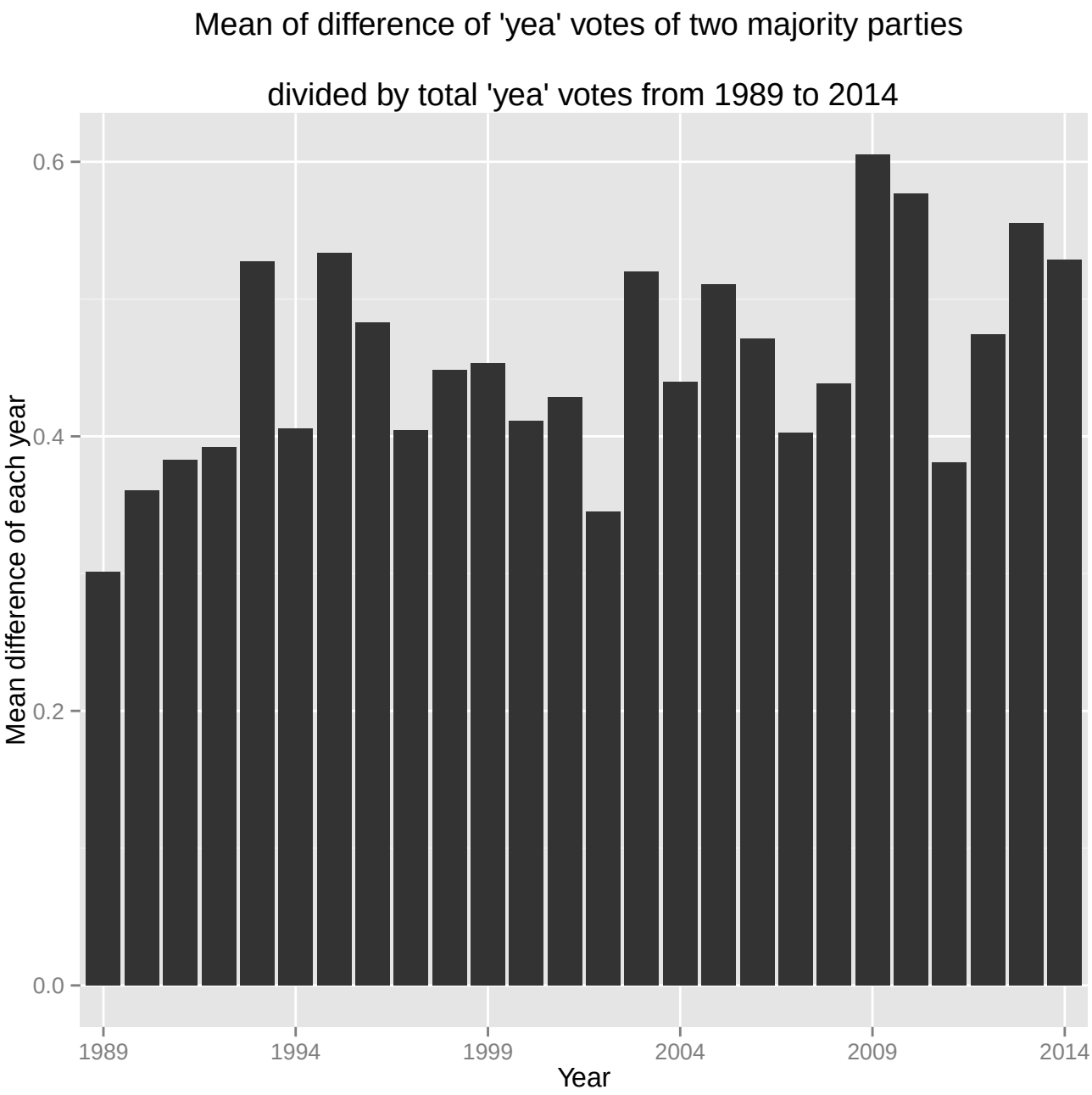
```
## Warning:  Removed 3 rows containing non-finite values (stat_boxplot).
## Warning:  Removed 3 rows containing missing values (geom_point).
```



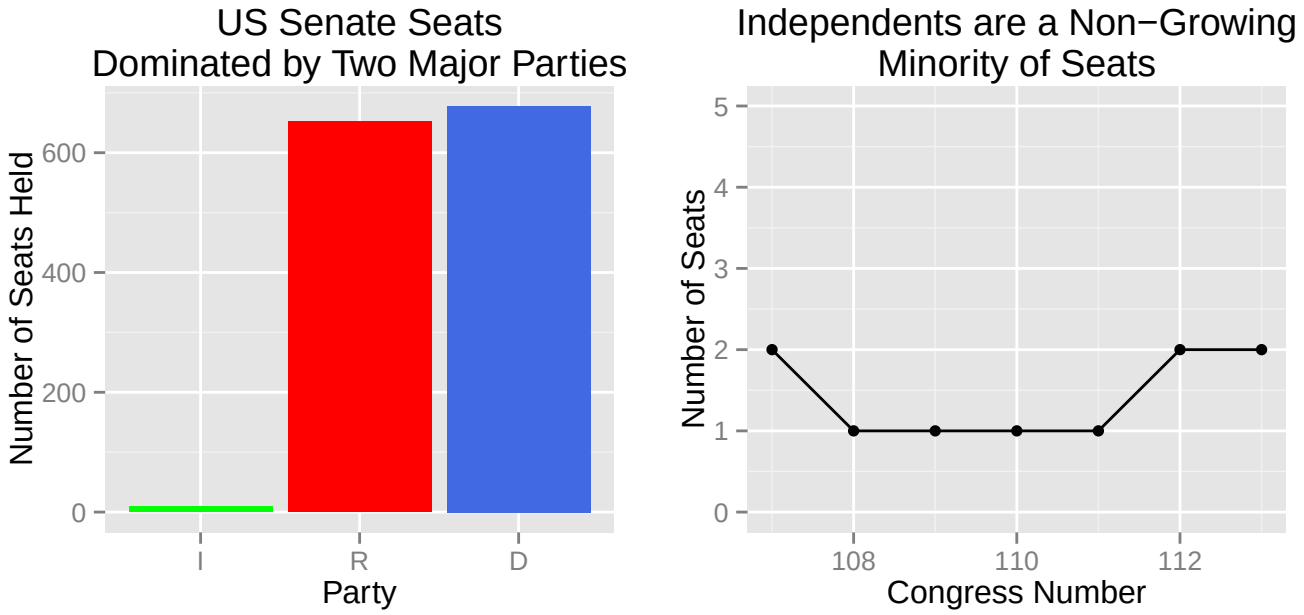
```
query = "SELECT yeas, nays, (yeas+nays) as total, (100*(yeas-nays)/(yeas+nays)) as voteDiff, congressNumber, ses
rollCallStats = queryDB(query, "data.sqlite")
rollCallStats$year = apply(rollCallStats, 1, function(x) {
    congressToYear(x["congressNumber"], x["sessionNumber"])
})
ggplot(rollCallStats, aes(x = as.factor(year), y = voteDiff)) + geom_boxplot() +
    geom_smooth(aes(group = 1), method = "lm") + geom_point(alpha = 0.1) + ggtitle("Roll-call Vote Disagreement
    xlab("\nYear") + ylab("Percentage Difference\n100*(Yea-Nay)/Total")
```

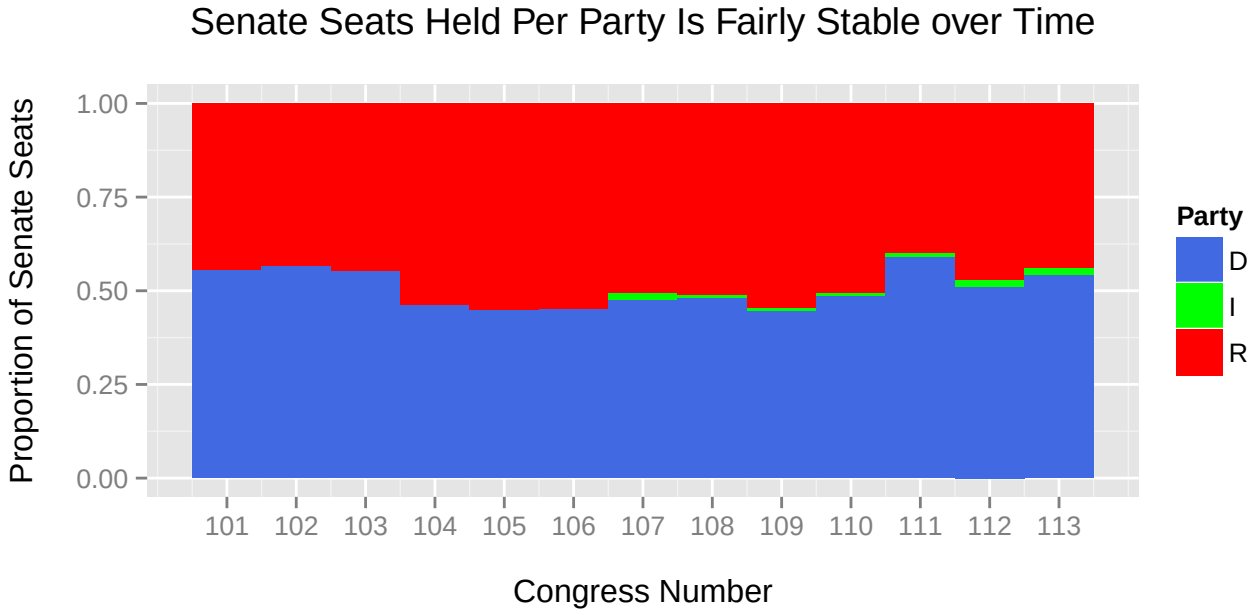


```
query = "select r.year as year, r.voteNumber as voteNumber,
            abs(r.c - d.c) * 1.0 / (r.c + d.c) as diff
         from (select voteNumber, year, count(*) as c
               from votes
               where vote == 'Yea' and party == 'R' group by year, voteNumber)
               as r
              join
            (select voteNumber, year, count(*) as c
               from votes
               where vote == 'Yea' and party == 'D' group by year, voteNumber)
               as d
            on r.voteNumber == d.voteNumber and r.year == d.year"
yeaDiff = queryDB(query, "data.sqlite")
yeaDiffMean = setNames(aggregate(diff ~ year, yeaDiff, mean), c("year", "mean"))
yeaDiffSd = setNames(aggregate(diff ~ year, yeaDiff, sd), c("year", "std"))
yeaDiffDistribution = merge(yeaDiffMean, yeaDiffSd, by="year")
ggplot(yeaDiffDistribution) +
aes(x = year, y = mean) +
scale_x_discrete(breaks=c(1989,1994,1999,2004,2009,2014)) +
labs(title="Mean of difference of 'yea' votes of two majority parties
     \ndivided by total 'yea' votes from 1989 to 2014") +
xlab("Year") +
ylab("Mean difference of each year") +
geom_bar(stat="identity")
```

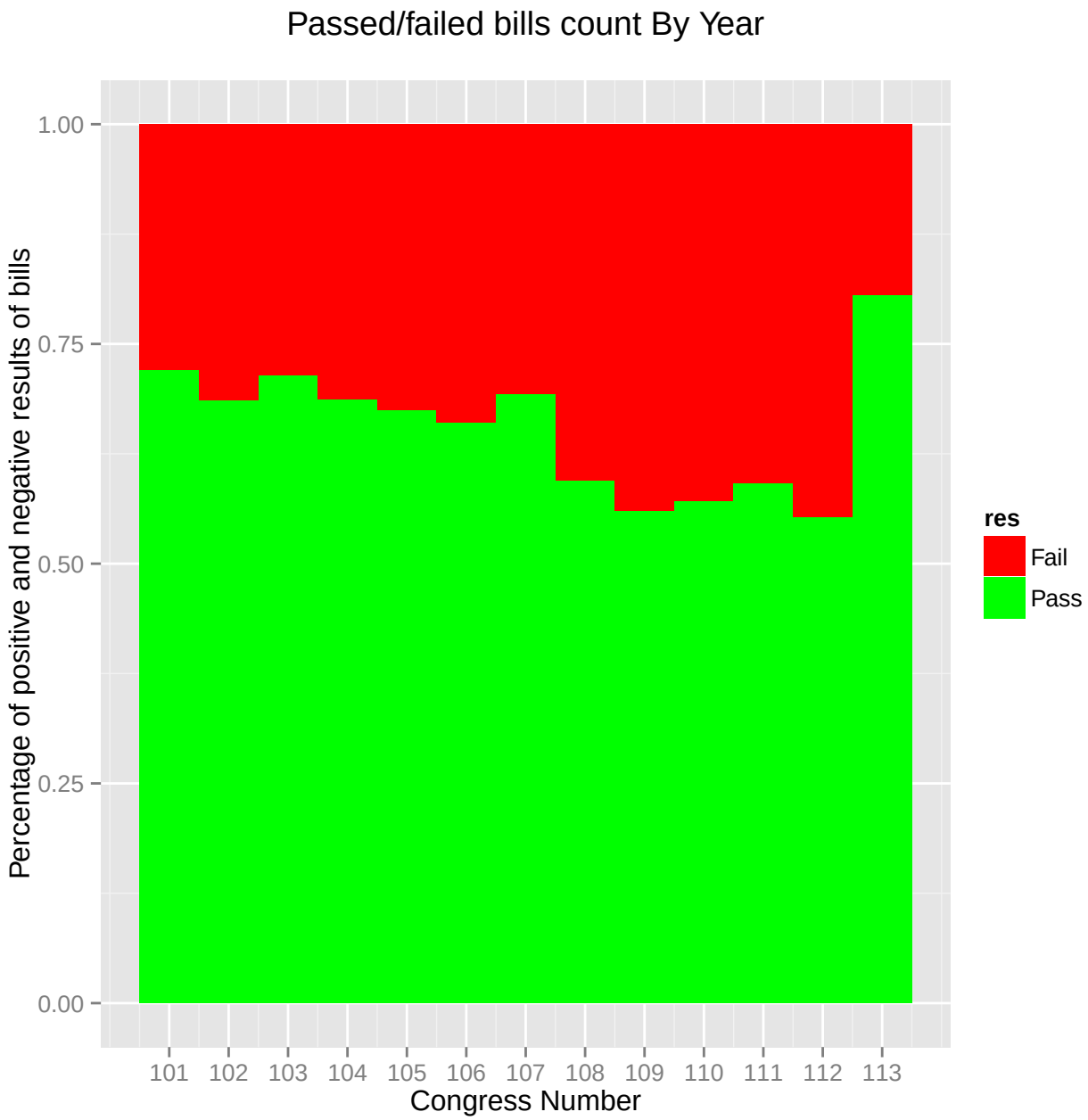

Mean of difference of 'yea' votes of two majority parties
divided by total 'yea' votes from 1989 to 2014
Mean difference of each year
0.0
0.2
0.4
0.6
1989
1994
1999
2004
2009
2014
Year

```
partyData = queryDB("SELECT party as Party, count(*) as ct FROM members WHERE party!='ID' GROUP BY party")
a = ggplot(partyData, aes(x=reorder(Party, ct), y=ct))+geom_bar(stat="identity", fill=c("green", "red", "#4169
independentDataByYear = queryDB("SELECT party as Party, congressNumber, count(*) as ct FROM members WHERE part
b=ggplot(independentDataByYear, aes(x=congressNumber, y=ct))+geom_point()+geom_line()+ggtitle("")+ylim(0,5)+xl
partyDataByYear = queryDB("SELECT party as Party, congressNumber, count(*) as ct FROM members WHERE party!='ID
c = ggplot(partyDataByYear, aes(x=congressNumber, y=ct, fill=Party))+scale_fill_manual(name = "Party", values
grid.newpage()
pushViewport(viewport(layout=grid.layout(2, 2)))
print(a, vp = viewport(layout.pos.row=1, layout.pos.col=1))
print(b, vp = viewport(layout.pos.row=1, layout.pos.col=2))
print(c, vp = viewport(layout.pos.row=2, layout.pos.col=1:2))
```





```
passedQuery <- "select 'Pass' as res, congressNumber, count(*) as cnt
          from senateRollCalls
          where result == 'Agreed to'
                or result == 'Confirmed'
                or result == 'Passed'
          group by congressNumber"
passedResults <- queryDB(passedQuery, "data.sqlite")
failedQuery <- "select 'Fail' as res, congressNumber, count(*) as cnt
          from senateRollCalls
          where result == 'Rejected'
          group by congressNumber"
failedResults <- queryDB(failedQuery, "data.sqlite")
results <- rbind(passedResults, failedResults)
ggplot(results) + aes(x=congressNumber, y=cnt, fill=res) +
  geom_histogram(position="fill", stat="identity", width=1) +
  scale_fill_manual(name = "res", values = c("red", "green")) +
  xlab("Congress Number\n") +
  scale_x_continuous(breaks=101:113) +
  ylab("\nPercentage of positive and negative results of bills") +
  ggtitle("Passed/failed bills count By Year\n")
```


Passed/failed bills count By Year
Percentage of positive and negative results of bills
1.00
0.75
0.50
0.25
0.00
101
102
103
104
105
106
107
108
109
110
111
112
113
Congress Number
res
Fail
Pass

```
memberPct = queryDB("SELECT id, party, missed_votes_pct as missed, votes_with_party_pct as withParty, next_ele
memberPct$withParty = as.integer(as.character(memberPct$withParty))
memberPct$congressNumber = as.factor(memberPct$congressNumber)
ggplot(memberPct, aes(x=congressNumber, y=withParty, fill=party))+geom_boxplot()+xlab("Congress Number")+ylab(
```