中国人民大学

RENMIN UNIVERSITY OF CHINA

FINVIZ 金融可视化功能实现

——R 语言期末实验报告

课　　程：风险计量分析与工具

组　　别：第一组

组　　员：朱晓芸 2019100447

周　妮 2019100443

R FINVIZ Visualization

朱晓芸 2019100447 周妮 2019100443

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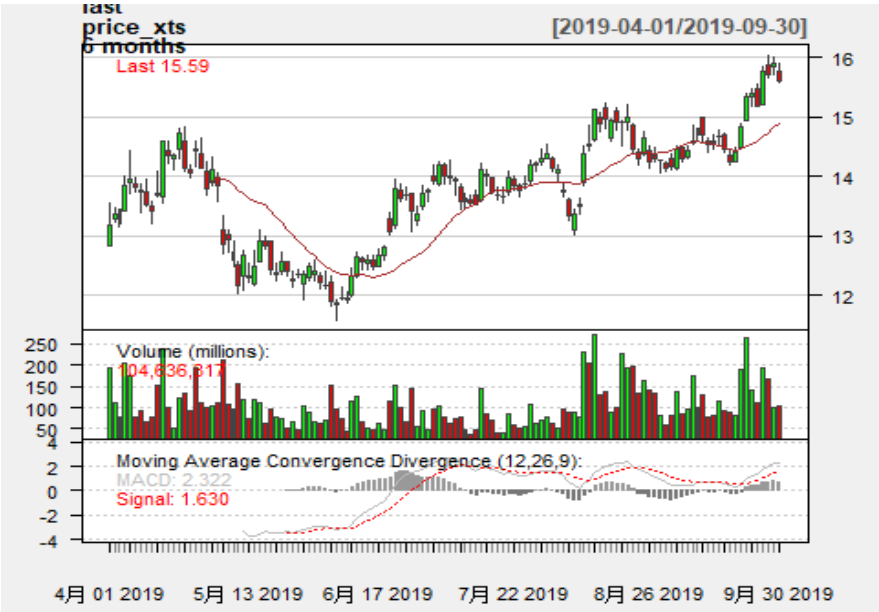
Github 地址：https://github.com/Oliviyaa/R-FINVIZ-group1

功能 1：个股价格趋势与技术分析

绘制日 K 线图，添加交易量、MACD、SMA 指标

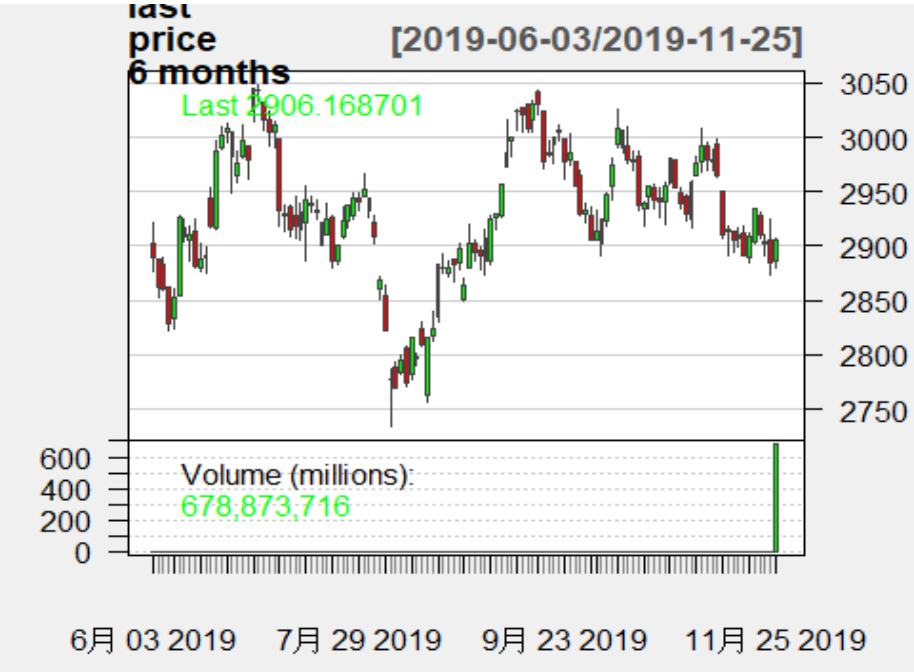
```
#从锐思下载数据
price1=read.delim(paste(path,"function1.txt",sep='/'),header=T)
#数据：function1.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#stkcd       股票代码       Stock Code
#lstknm      最新股票名称      Latest Stock Name
#date        日期       Date
#prevclpr        前收盘价       Previous Close Price
#oppr        开盘价       Open Price
#hipr        最高价       High Price
#lopr        最低价       Low Price
#clpr        收盘价       Close Price
#adjclpr1        复权价 1      Adjusted Price1
#trdvol      成交量       Trading Volume
#dret        日收益率       Daily Return
date=as.Date(price1$date,format="%Y-%m-%d")
price1<-select(price1,"date","oppr","hipr","lopr","clpr","adjclpr1","trdvol
")%>%
  dplyr::rename('000001.SS.Open' = 'oppr','000001.SS.High'='hipr','000001.SS.
Low'='lopr','000001.SS.Close'='clpr','000001.SS.Adjusted'='adjclpr1','000001.
SS.Volume'='trdvol')
price_xts <- xts(as.data.table(price1)[,!1],order.by = date)
chartSeries(last(price_xts, '6 months'),theme='white',up.col='green',dn.col='
red',TA="addVo();addMACD();addSMA(n=20)")
```



```
# 绘制最近 6 个月的 k 线图，添加交易量、MACD、SMA 指标

# 从 yahoo 下载数据
price<-getSymbols("000001.ss",from = "2016-06-01",to = Sys.Date(),src = "yaho
o",auto.assign=FALSE)
# 上证综指
#查看最近 8 天的数据
kable(tail(price,n=8),align='c')
```

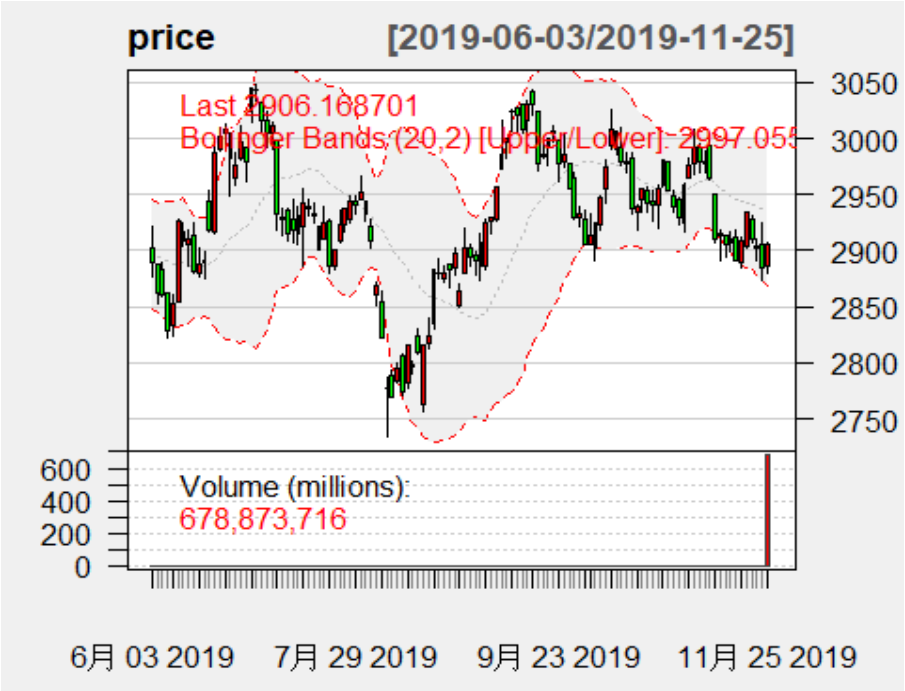
000001.SS. Open	000001.SS. High	000001.SS. Low	000001.SS. Close	000001.SS. Volume	000001.SS. Adjusted
2907.740	2917.370	2899.620	2909.870	129100	2909.870
2911.350	2917.830	2891.200	2891.340	135500	2891.340
2889.550	2911.380	2884.090	2909.200	124400	2909.200
2904.280	2933.990	2902.860	2933.990	135400	2933.990
2928.110	2930.490	2907.420	2911.050	137400	2911.050
2902.550	2910.360	2891.530	2903.640	123500	2903.640
2906.240	2925.020	2873.990	2885.290	158600	2885.290
2885.613	2906.609	2880.654	2906.169	678873716	2906.169

```
# 绘制最近 6 个月的 k 线图，添加交易量指标
chartSeries(last(price, '6 months'),theme='white',up.col='green',dn.col='red
',TA="addVo()")
```

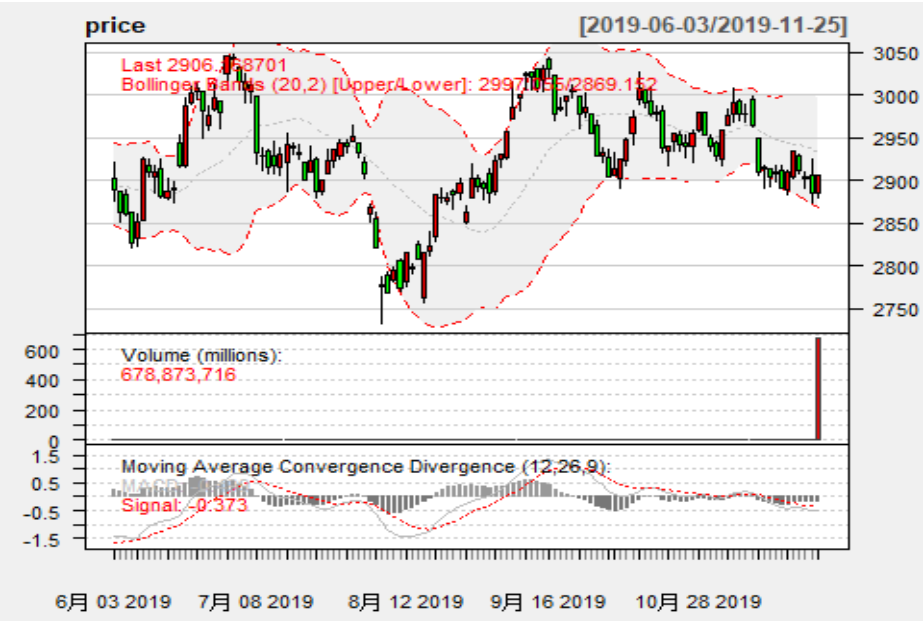


技术分析

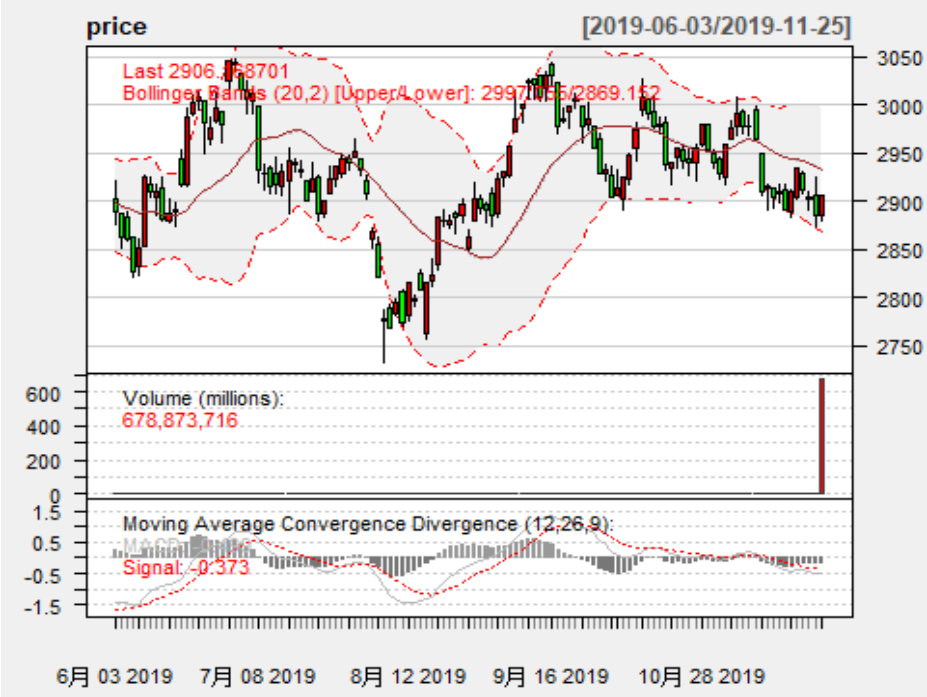
```
mytheme<-chartTheme(theme="white",up.col="red",up.border="black",dn.col="green",dn.border="black")
chartSeries(price,subset="last 6 months",TA=(c(addVo(),addBBands())),theme=mytheme)
```



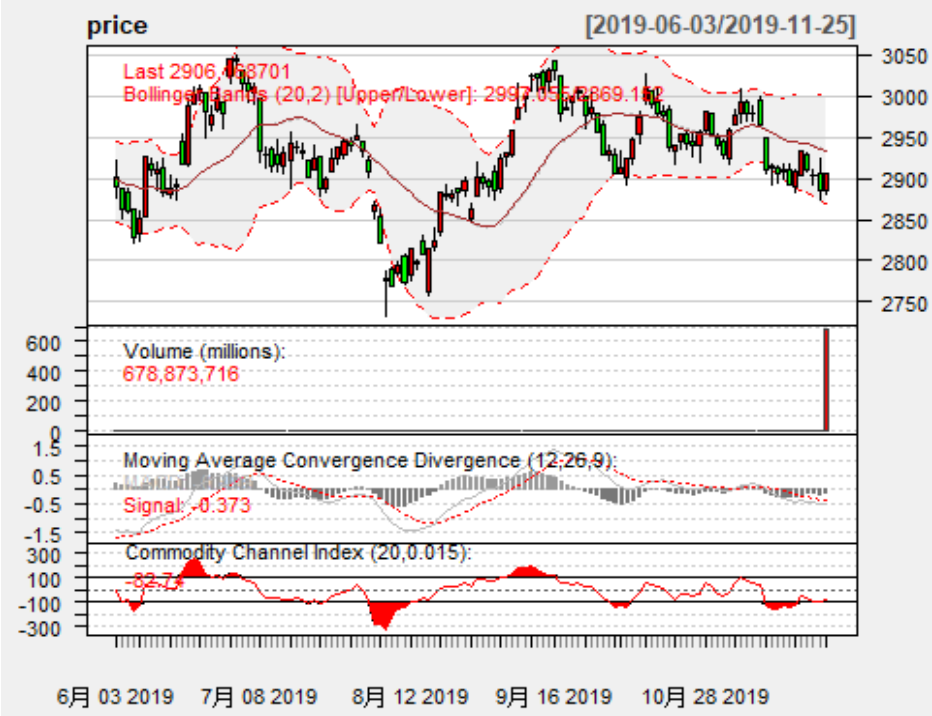

```
#为当前图标加上 MACD 指标
#MACD：异同移动平均线，由快、慢均线的离散、聚合表征当前的多空状态和股价可能的发展变化趋势
addMACD()
```



```
#SMA20：20 日移动平均线
addSMA(n=20)
```




```
#CCI：顺势指标，测量股价是否已超出常态分布范围
addCCI()
```




```
setTA()#使用 chartSeries 里面的默认值
```

功能 2：市场总体表现

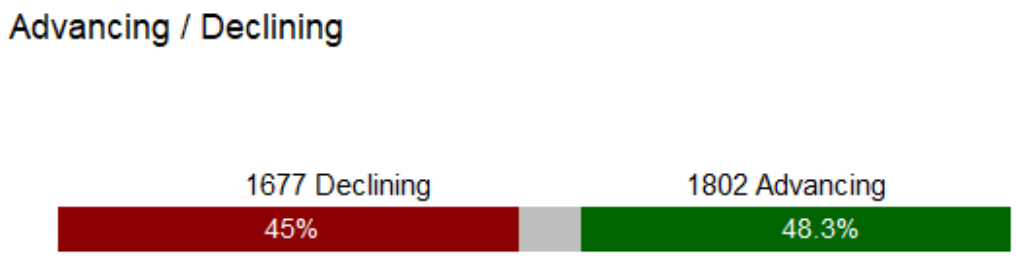
市场涨跌幅，新高、新低，SMA50、SMA100 表现

功能 2.1：涨跌统计

交易日内上涨/下跌股票数

```
TradeStock=read.delim(paste(path,"function2.1.txt",sep='/'),header=T)
#数据：function2.1.txt
#数据来源：RESSET 数据库—RESSET 股票—行情与分配—股票最新行情表现
#stkcd            股票代码              Stock Code
#lstknm           最新股票名称          Latest Stock Name
#trddt            日期                  Trade Date
#prevclpr         前收盘价              Previous Close Price
#clpr             收盘价                Close Price
#clloprrec12mon   十二个月收盘最低价    Close Low Price Recent 12 Month
#clhiprrec12mon   十二个月收盘最高价    Close High Price Recent 12 Month
#计算涨跌
table1<-TradeStock%>%
  mutate(result=clpr-prevclpr)%>%
  mutate(position=(if_else(result>0,'Advancing',if_else(result==0,'Steady','D
ecining'))))%>%
  mutate(value=1)
#定义标识向量
color<-c('darkred','grey','darkgreen')
symbol<-c('Advancing','Steady','Declining')
#统计涨跌数与比例
a <- transform(table1,trend=if_else(result>0,1,if_else(result<0,-1,0)))
b <- ddply(a,"trend",summarise,number=length(lstknm))
c<-ddply(b,'number',.fun=function(x){transform(x, percentage=with(x,ave(numbe
r,trend,FUN=sum)*100/sum(b$number)))})
percentage<-paste(round(as.numeric(as.character(c$percentage)),1),'%',sep='')
df<-data.frame(symbol,number=c(b$number[3],b$number[2],b$number[1]),percentag
e=c(percentage[3],percentage[1],percentage[2]),value=c(1,1,1))
df<-data.frame(df,label=paste(df$number,df$symbol,sep=' '))
df$symbol<-factor(df$symbol,levels=symbol)
#绘制涨跌情况分布图
ggplot(df,aes(x=df$value,y=df$number,fill=symbol)) +
  scale_fill_manual(values = color)+
  geom_bar(stat='identity',position = position_stack(reverse=T))+#堆叠图
  geom_text(label=levels(df$percentage),position = position_stack(0.0),vjust=
0.3, hjust =-3.8,color="white", size=3.8,check_overlap = TRUE)+
  geom_text(label=levels(df$label),position = position_stack(0.0),vjust=-1.5,
 hjust =-1,color="black", size=4,check_overlap = TRUE)+
  theme_minimal()+
```

```
  coord_flip()+ #横向
  labs(x='',y='')+
  theme(legend.position='none')+
  theme(panel.grid = element_blank())+
  theme(axis.text = element_blank())+
  ggtitle("Advancing / Declining") +
  xlim(-4,4)
```

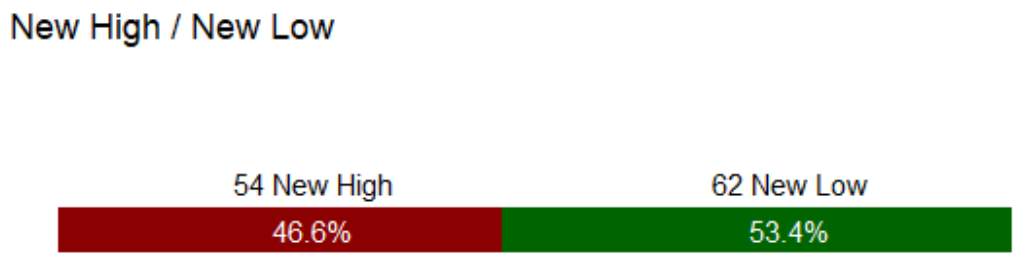


功能 2.2：新高、新低统计

交易日内股票价格达新高/新低的股票数

```
#计算 New high&New low
table2<-TradeStock%>%
  mutate(position=(if_else(TradeStock$clpr==TradeStock$clhiprrec12mon,'New Hi
gh',if_else(TradeStock$clpr==TradeStock$clloprrec12mon,'New Low','Null
'))))%>%
  mutate(value=1)
#重新定义标识
color<-c('darkred','darkgreen')
symbol<-c('New High','New Low')
#统计新高新低情况
a <- transform(table2,trend=if_else(TradeStock$clpr==TradeStock$clhiprrec12mo
n,1,if_else(TradeStock$clpr==TradeStock$clloprrec12mon,-1,0)))
b <- ddply(a,"trend",summarise,number=length(lstknm))
b<-b[-2,]
c<-ddply(b,'number',.fun=function(x){transform(x, percentage=with(x,ave(numbe
r,trend,FUN=sum)*100/sum(b$number)))})
df<-data.frame(symbol,number=c$number,percentage=c$percentage,value=c(1,1))
percentage<-round(as.numeric(as.character(c$percentage)),1)
percentage<-paste(percentage,'%',sep='')
df<-data.frame(symbol,number=df$number,percentage=percentage,value=c(1,1))
df<-data.frame(df,label=paste(df$number,df$symbol,sep=' '))
```

```
#绘制新高新低图
ggplot(df,aes(x=df$value,y=df$number,fill=symbol)) +
  scale_fill_manual(values = color)+
  geom_bar(stat='identity',position = position_stack(reverse=T))+
  geom_text(label=df$percentage,position = position_stack(0.5),color="white",
 size=4,check_overlap = TRUE)+
  geom_text(label=df$label,position = position_stack(0.5),vjust=-1.5,color="b
lack", size=4,check_overlap = TRUE)+
  theme_minimal()+
  coord_flip()+
  labs(x='',y='')+
  theme(legend.position='none')+
  theme(panel.grid = element_blank())+
  theme(axis.text = element_blank())+
  ggtitle("New High / New Low") +
  xlim(-4,4)
```



功能 2.3：日均线分析

交易日内股票价格高于/低于移动平均线（SMA）的股票数

```
table3=read.delim(paste(path,"function2.2.txt",sep='/'),header=T)
#数据：function2.2.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#stkcd      股票代码      Stock Code
#lstknm      最新股票名称      Latest Stock Name
#date      日期      Date
#clpr      收盘价      Close Price
#对数据进行重新排序
setcolorder(table3,c('date','stkcd','lstknm','clpr'))
table3<-table3[complete.cases(table3$clpr),]
#计算 50 日与 100 均值
table3<-table3%>%
  mutate(SMA1=SMA(table3$clpr,n=50))%>%
  mutate(SMA2=SMA(table3$clpr,n=100))
symbol<-c('Above','Below')
```

```
SMA50<-table3[,-7]%>%
  filter(date=='2019-09-30')
SMA100<-table3[,-6]%>%
  filter(date=='2019-09-30')
##50 日均线
a <- transform(SMA50,trend=if_else(SMA50$clpr>SMA50$SMA1,1,if_else(SMA50$clpr
<SMA50$SMA1,-1,0)))
b <- ddply(a,"trend",summarise,number=length(lstknm))
c<-ddply(b,'number',.fun=function(x){transform(x, percentage=with(x,ave(numbe
r,trend,FUN=sum)*100/sum(b$number)))})
df<-data.frame(symbol,number=c$number,percentage=c$percentage,value=c(1,1))
percentage<-round(as.numeric(as.character(c$percentage)),1)
percentage<-paste(percentage,'%',sep='')
df<-data.frame(symbol,number=df$number,percentage=percentage,value=c(1,1))
df<-data.frame(df,label=paste(df$number,df$symbol,sep=' '))


#绘制 SMA50 统计情况
ggplot(df,aes(x=df$value,y=df$number,fill=symbol)) +
  scale_fill_manual(values = color)+
  geom_bar(stat='identity',position = position_stack(reverse=T))+
  geom_text(label=levels(df$percentage),position = position_stack(0.2),color=
"white", size=3.7,check_overlap = TRUE)+
  geom_text(label=levels(df$label),vjust=-1.5, position = position_stack(0.
2),color="black", size=4,check_overlap = TRUE)+
  theme_minimal()+
  coord_flip()+
  labs(x='',y='')+
  theme(legend.position='none')+
  theme(panel.grid = element_blank())+
  theme(axis.text = element_blank())+
  ggtitle("SMA50") +
  xlim(-4,4)
```


```
##100 日均线
a <- transform(SMA100,trend=if_else(SMA100$clpr>SMA100$SMA2,1,if_else(SMA100
$clpr<SMA100$SMA2,-1,0)))
b <- ddply(a,"trend",summarise,number=length(lstknm))
```

```
c<-ddply(b,'number',.fun=function(x){transform(x, percentage=with(x,ave(numbe
r,trend,FUN=sum)*100/sum(b$number)))})
df<-data.frame(symbol,number=c$number,percentage=c$percentage,value=c(1,1))
percentage<-round(as.numeric(as.character(c$percentage)),1)
percentage<-paste(percentage,'%',sep='')
df<-data.frame(symbol,number=df$number,percentage=percentage,value=c(1,1))
df<-data.frame(df,label=paste(df$number,df$symbol,sep=' '))


#绘制 SMA100 统计情况
ggplot(df,aes(x=df$value,y=df$number,fill=symbol)) +
  scale_fill_manual(values = color)+
  geom_bar(stat='identity',position = position_stack(reverse=T))+
  geom_text(label=levels(df$percentage),position = position_stack(0.2),color=
"white", size=3.7,check_overlap = TRUE)+
  geom_text(label=levels(df$label),vjust=-1.5, position = position_stack(0.
2),color="black", size=4,check_overlap = TRUE)+
  theme_minimal()+
  coord_flip()+
  labs(x='',y='')+
  theme(legend.position='none')+
  theme(panel.grid = element_blank())+
  theme(axis.text = element_blank())+
  ggtitle("SMA100") +
  xlim(-4,4)
```

功能 3：不同 signal 内股票表现

不同分类标识（signal）：

（1）Top Gainers，Top Losers：当日收益率为最高或最低

（2）New High，New Low：股票价格达到一年内新高或新低

（3）Overbought，Oversold：股票价格上涨或下跌幅度高于前两周

（4）Unusual Volume：存在异常高交易量的股票

Most Volatile：最具波动性的股票

Most Active：交易最活跃的股票

```
signal=read.delim(paste(path,"function3.1.txt",sep='/'),header=T)
#数据：function3.1.txt
#数据来源：RESSET 数据库—RESSET 股票—行情与分配—股票最新行情表现
#stkcd       股票代码      Stock Code
#lstknm       最新股票名称      Latest Stock Name
#trddt       交易日      Trading Date
#clpr       收盘价      Close Price
#trdvol       成交量      Trading Volume
#chgpct       涨跌幅      Change Percent
#clhiprrec12mon       十二个月收盘最高价      Highest Close Price in the Recent 1
2 Months
#clloprrec12mon       十二个月收盘最低价      Lowest Close Price in the Recent 12
 Months
###分类标识 1：Top Gainers&Top Losers
signal1<-data.frame(signal)%>%
  arrange(desc(chgpct))
table<-select(signal1,Ticker='lstknm',Last='clpr',Change='chgpct',Volume='trd
vol')
table$Change<-paste(table$Change,'%',sep='')
table1<-first(table,n=6)%>%
mutate(signal="Top Gainers")
table2<-last(table,n=6)%>%
  mutate(signal="Top Losers")
###分类标识 2：New High&New Low
signal2<-signal%>%
  mutate(position=(if_else(signal$clpr==signal$clhiprrec12mon,'New High',if_e
lse(signal$clpr==signal$clloprrec12mon,'New Low','Null'))))%>%
  arrange(position,desc(chgpct))
signal2<-filter(signal2,signal2$position=='New High'|signal2$position=='New L
ow')
table<-select(signal2,Ticker='lstknm',Last='clpr',Change='chgpct',Volume='trd
vol',signal='position')
table$Change<-paste(table$Change,'%',sep='')
table1<-rbind(table1,table[1:4,])
```

```
table2<-rbind(table2,last(table,n=4))
###分类标识 3：Overbought&Oversold
sign=read.delim(paste(path,"function3.2.txt",sep='/'),header=T)
#数据：function3.2.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#stkcd      股票代码     Stock Code
#lstknm      最新股票名称     Latest Stock Name
#date      日期     Date
#clpr      收盘价     Close Price
setcolorder(sign,c('date','stkcd','lstknm','clpr'))
sign<-sign[complete.cases(sign$clpr),]
sign<-sign%>%
  mutate(RSI=RSI(sign$clpr,n=14,maType = SMA))%>%
  filter(date=='2019-09-30')%>%
  inner_join(signal,sign,by='stkcd')%>%
  arrange(desc(RSI))
table<-select(sign,Ticker='lstknm.y',Last='clpr.y',Change='chgpct',Volume='tr
dvol')
table$Change<-paste(table$Change,'%',sep='')
table1<-rbind(table1,(first(table,n=2)%>%mutate(signal='Overbought')))
table2<-rbind(table2,(last(table,n=2)%>%mutate(signal='Oversold')))
###分类标识 4：Unusual Volume&Most Volatile&Most Active
#由于我国交易存在涨跌幅限制，所以异常交易量不按高位异常判断，仅按高交易低收益判断

signal3<-signal%>%
  arrange(desc(trdvol))%>%
  filter(chgpct<1&chgpct>-1)
table<-select(signal3,Ticker='lstknm',Last='clpr',Change='chgpct',Volume='trd
vol')
table$Change<-paste(table$Change,'%',sep='')
table1<-rbind(table1,(table[1:4,]%>%mutate(signal='Unusual Volume')))

sign=read.delim(paste(path,"function3.3.txt",sep='/'),header=T)
#数据：function3.3.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#stkcd      股票代码     Stock Code
#lstknm      最新股票名称     Latest Stock Name
#hipr      最高价     Highest Price
#lopr      最低价     Lowest Price
sign<-sign%>%
  mutate(result=sign$hipr-sign$lopr)%>%
  inner_join(signal,sign,by='stkcd')%>%
  arrange(desc(result))
table<-select(sign,Ticker='lstknm.y',Last='clpr',Change='chgpct',Volume='trdv
ol')
table$Change<-paste(table$Change,'%',sep='')
table2<-rbind(table2,(table[1:2,]%>%mutate(signal='Most Volatile')))
signal4<-signal%>%
```

```
  arrange(desc(trdvol))
table<-select(signal4,Ticker='lstknm',Last='clpr',Change='chgpct',Volume='trd
vol')
table$Change<-paste(table$Change,'%',sep='')
table2<-rbind(table2,(table[1:2,]%>%mutate(signal='Most Active')))
#合并表
table1<-mutate(table1,Index=c(1:16))
table2<-mutate(table2,Index=c(1:16))
table<-inner_join(table1,table2,by='Index')
table<-table[,-6]
#table
kable(table,table.attr = "class=\"table table-bordered\"", align="c",digits =
 2,booktabs=T)
```

Ticker.x	Last.x	Change.x	Volume.x	signal.x	Ticker.y	Last.y	Change.y	Volume.y	signal.y
银鸽投资	2.70	10.20%	2799.17	Top Gainers	上海电影	17.09	-10.00%	419.08	Top Losers
星辉娱乐	5.12	10.10%	1454.61	Top Gainers	五方光电	40.02	-10.00%	1508.54	Top Losers
智慧松德	4.80	10.09%	600.95	Top Gainers	威派格	20.41	-10.00%	1827.47	Top Losers
金石东方	8.42	10.06%	540.65	Top Gainers	智能自控	8.36	-10.01%	3020.26	Top Losers
大烨智能	9.85	10.05%	727.57	Top Gainers	多喜爱	8.00	-10.01%	2175.51	Top Losers
大金重工	6.02	10.05%	1734.48	Top Gainers	亿通科技	7.53	-10.03%	3377.83	Top Losers
大金重工	6.02	10.05%	1734.48	New High	华信退	0.21	-4.54%	4141.15	New Low
天顺股份	26.68	10.02%	573.46	New High	*ST 信威	1.41	-4.72%	7118.25	New Low
乐歌股份	33.17	10.01%	1248.70	New High	仙乐健康	69.80	-9.66%	466.04	New Low
京华激光	24.72	10.01%	974.87	New High	海普瑞	16.74	-10%	1082.02	New Low
中科软	79.61	-10.00%	2251.35	Overbought	华能国际	5.82	0.34%	1554.92	Oversold
宝鼎科技	21.32	10.01%	1726.44	Overbought	华信退	0.21	-4.54%	4141.15	Oversold
京东方 A	3.75	0%	29495.26	Unusual Volume	卓胜微	337.46	-9.99%	307.03	Most Volatile
农业银行	3.48	0.57%	17250.77	Unusual Volume	贵州茅台	1167.10	1.48%	310.45	Most Volatile
工商银行	5.56	0.54%	12531.76	Unusual Volume	京东方 A	3.75	0%	29495.26	Most Active
东方财富	14.77	-0.06%	11460.30	Unusual Volume	光大银行	4.09	3.80%	19113.37	Most Active

功能 4：绘制股票板块层级图

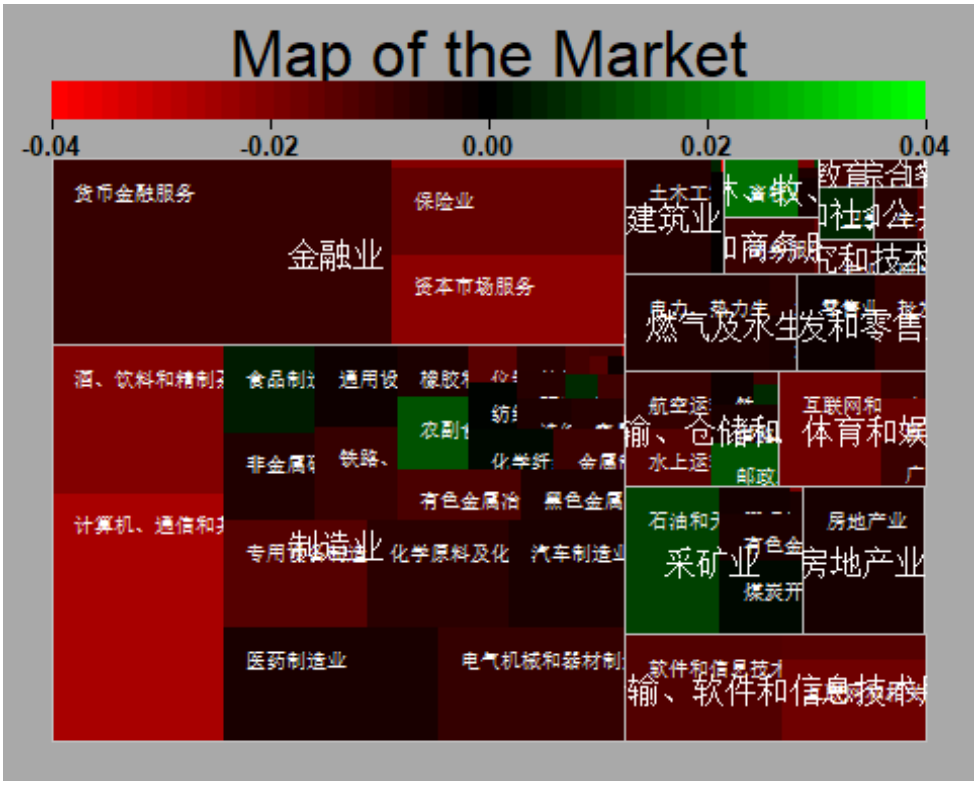
按行业及细分行业分类，绘制板块层级图，个股板块颜色与涨跌有关（收益率低→高：绿-黑-红），板块大小与板块/股票市值成比例

注：行业分类

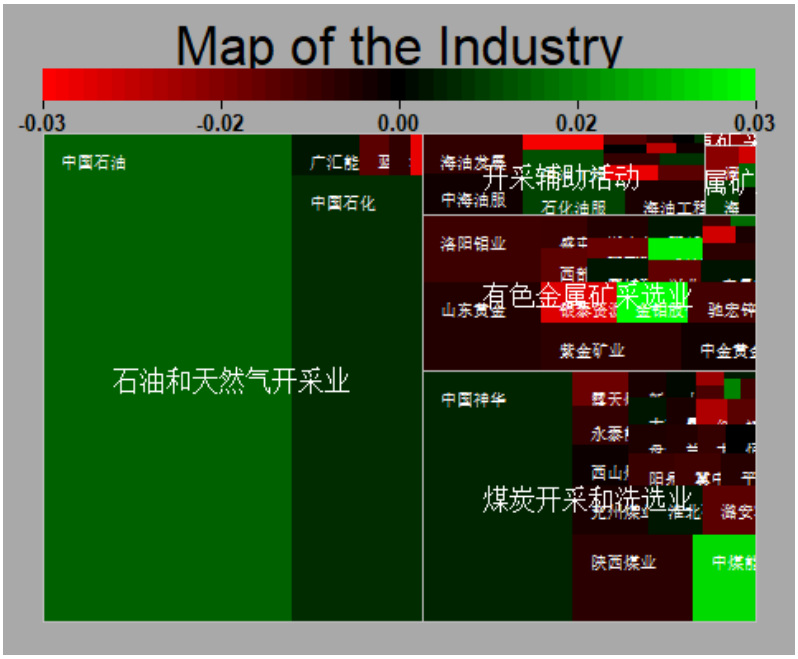
按证监会行业(csrciccd1)进行分类：　　A-农、林、牧、渔业；B-采矿业；C-制造业；D-电力、热力、燃气及水生产和供应业；E-建筑业；F-批发和零售业；G-交通运输、仓储和邮政业；H-住宿和餐饮业；I-信息传输、软件和信息技术服务业；J-金融业；K-房地产业；L-租赁和商务服务业；M-科学研究和技术服务业；N-水利、环境和公共设施管理业；O-居民服务、修理和其他服务业；P-教育；Q-卫生和社会工作；R-文化、体育和娱乐业；S-综合

```
#绘制板块层级图 tree map

#行业与收益率数据
DRET=read.delim(paste(path,"function4_DRESSTK.txt",sep='/'),header=T)
#数据：function4_DRESSTK.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#stkcd　　股票代码　　Stock Code
#lstknm　　最新股票名称　　Latest Stock Name
#csrciccd1　　证监会行业门类代码　　First Level Code of Csrc Ic
#csrciccd2　　证监会行业大类代码　　Second Level Code of Csrc Ic
#dret　　日收益率　　Daily Return

#市值
DMV=read.delim(paste(path,"function4_DMV.txt",sep='/'),header=T)
#数据：function4_DMV.txt
#数据来源：RESSET 数据库—RESSET 股票—市值—日市值
#stkcd　　股票代码　　Stock Code
#dmc　　日总市值　　Daily Market Capitalization
# 合并原始数据表
data_raw <- inner_join(DRET,DMV,by="stkcd")[c("stkcd","lstknm","csrciccd1","csrciccd2","dret","dmc")]

#行业名称
#数据:function4_CSRCIND.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
CSRCIND <- read.delim(paste(path,"function4_CSRCIND.txt",sep='/'),header=T)
 %>%
  subset(select=c(csrciccd1,csrcicnm1,csrciccd2,csrcicnm2)) %>%
  unique()
CSRCIND <- CSRCIND[order(CSRCIND$csrciccd2),] %>% subset(select=-csrciccd1)
data_raw=merge(data_raw,CSRCIND,by="csrciccd2")
```

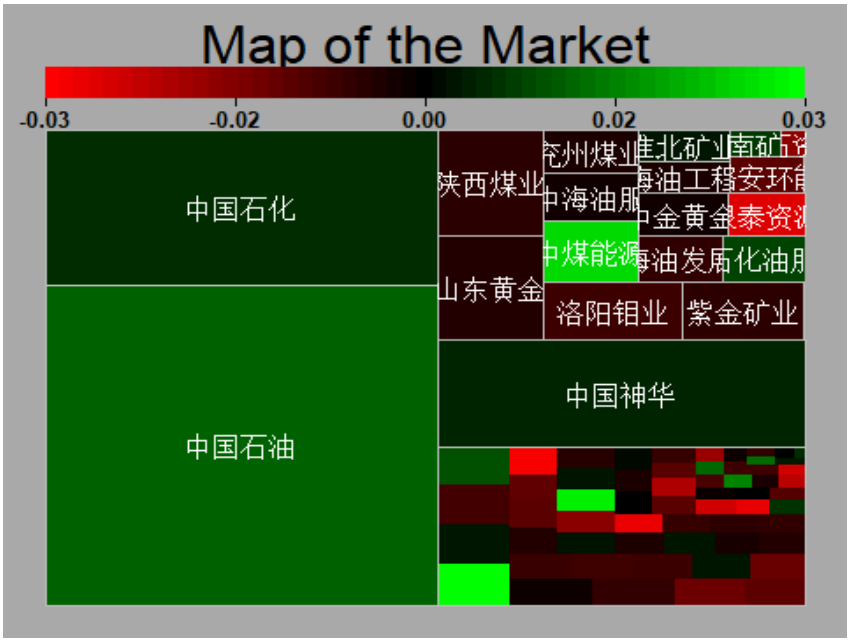
```
#（1）全市场各行业板块层级图：区分行业大门类内细分行业收益与市值分布
#细分行业收益使用市值加权收益率
industry2_dret <- ddply(data_raw,"csrciccd2",summarize,wm_dret=weighted.mean
(dret, dmc),sum_mv=sum(dmc))
data_map_ind <- merge(industry2_dret,unique(data_raw[c("csrciccd1","csrciccd2
","csrcicnm1","csrcicnm2")]),by="csrciccd2",all.industry2_dret=T,all.data_raw
=F)
map.market(id = data_map_ind$csrcicnm2,
           area = data_map_ind$sum_mv,  #面积与市值成比例
           group = data_map_ind$csrcicnm1, #按行业门类分类
           lab   = c("group"=TRUE, "id"=TRUE),
           color = data_map_ind$wm_dret)
```




```
#（2）具体门类（B-采矿业）内各股票收益与市值分布
data_map <- subset(data_raw, csrciccd1 == 'B')
map.market(id = data_map$lstknm,
           area = data_map$dmc,  #面积与市值成比例
           group = data_map$csrcicnm2,
           main  = "Map of the Industry",
           lab   = c("group"=TRUE, "id"=TRUE),
           color = data_map$dret)
```



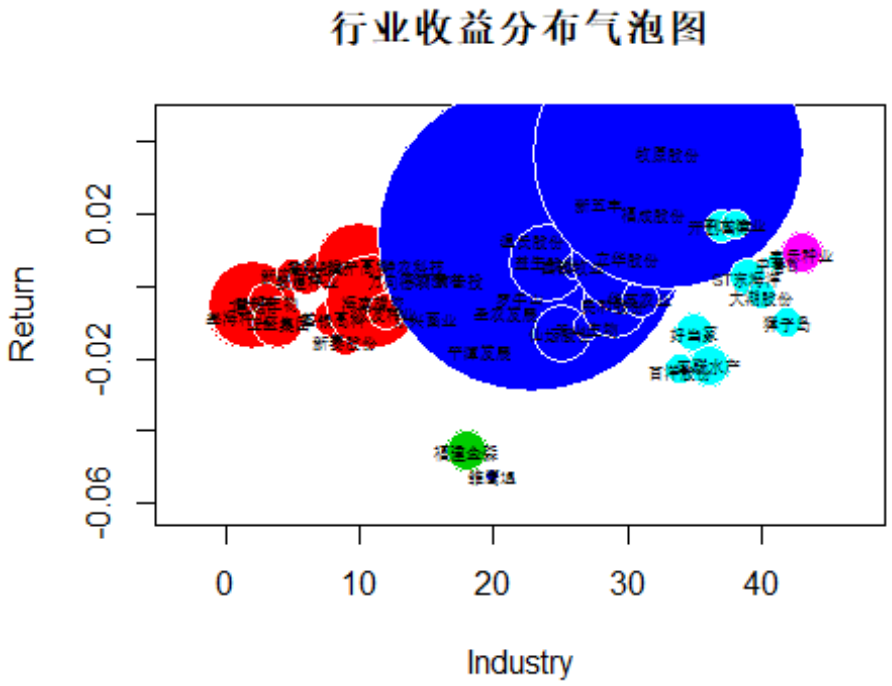

```
# （3）显示行业门类内各细分行业中市值前 20%的公司
quantiles<-tapply(data_map$dmc,factor(data_map$csrciccd2),function(x) {return
(quantile(x,probs=0.8))})
quantiles<-as.data.frame(as.matrix(quantiles)) %>%
  mutate(csrciccd2=rownames(quantiles))
data_map2 <- merge(data_map,quantiles,by="csrciccd2",all.data_map=T) %>%
  transform(show_name = ifelse(dmc>=V1,as.character(data_map$lstknm)," "))
map.market(id = data_map2$lstknm,
           area = data_map2$dmc,  #面积与市值成比例
           group = data_map2$show_name, #分股票显示:仅显示市值最高的 20%的公司
           color = data_map2$dret)
```



功能 5：绘制股票行业收益分布气泡图

一个气泡代表一只股票，纵轴（气泡圆心位置）表示涨跌幅，气泡大小为市值，横轴为不同行业（sector），不同行业也以颜色区分。

```
# 功能 5 气泡图
data2=subset(data_raw, csrciccd1 == 'A')
id<- 1:nrow(data2)
data_bubble <- cbind(data2[order(data2$csrciccd1,data2$csrciccd2),],id)
# 使用 symbols 函数
symbols(data_bubble$id,data_bubble$dret,circle=sqrt(data_bubble$dmc),inches=
0.8,bg=data_bubble$csrciccd2,fg="white",
        main="行业收益分布气泡图",xlab="Industry",ylab="Return")
text(data_bubble$id,data_bubble$dret,data_bubble$lstknm,cex=0.5)
```

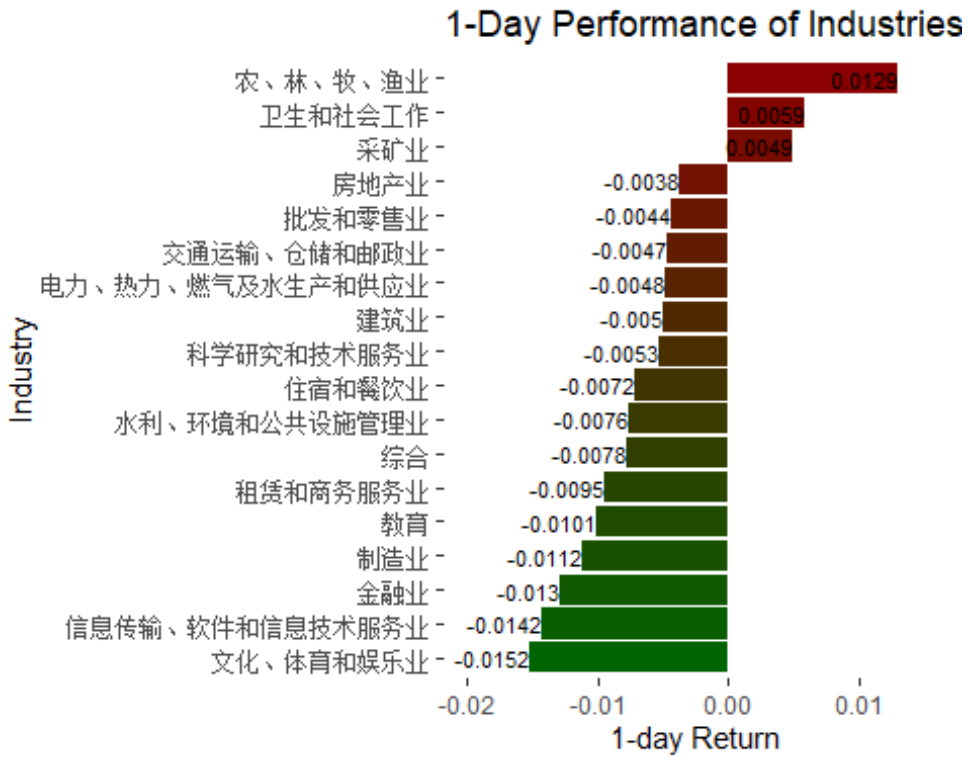



```
# 各细分行业为不同颜色
# 使用 plotly 包
plot_ly(data_bubble,x=~id,y=~dret,color=~csrcicnm2,size=~dmc,text=~lstknm,mar
ker = list(sizeref=0.1),
        type="scatter",mode="markers",colors="Set3") %>% layout(
  title = '气泡图',
  xaxis = list( title = "Industries", family='Courier New',size=22, color='#7
f7f7f'),
  yaxis = list(title = "Dret", family='Courier New', size=22, color='#7f7f7f
', tickformat = '.1%')
)
```

功能 6：各行业收益表现统计与比较

各行业收益统计排名（行业收益率=行业内所有股票的市值加权收益率）。

```
#功能 6 各行业收益统计（行业收益率=行业内所有股票的市值加权收益率）
industry_dret <- ddply(data_raw,"csrcicnm1",summarize,wm_dret=weighted.mean(dret, dmc))
industry_dret <- industry_dret[with(industry_dret, order(wm_dret)), ]
plot6<-ggplot(data=industry_dret, mapping=aes(x=reorder(csrcicnm1,wm_dret),y=wm_dret))+
  geom_bar(stat="identity",fill=colorRampPalette(c("darkgreen","darkred"))(18)) +
  theme(panel.background=element_rect(fill='transparent')) +
  geom_text(mapping = aes(label = round(industry_dret$wm_dret, digits = 4)),size=3,vjust=0.5,hjust=1) +
  ylim(-0.02,0.015) +
  ggtitle("1-Day Performance of Industries") +
  labs(y = "1-day Return",x="Industry") +
  coord_flip()
plot6
```



功能 7： 行业表现——估值

行业表现统计：股票数、总市值、PE、行业涨跌幅、交易量。

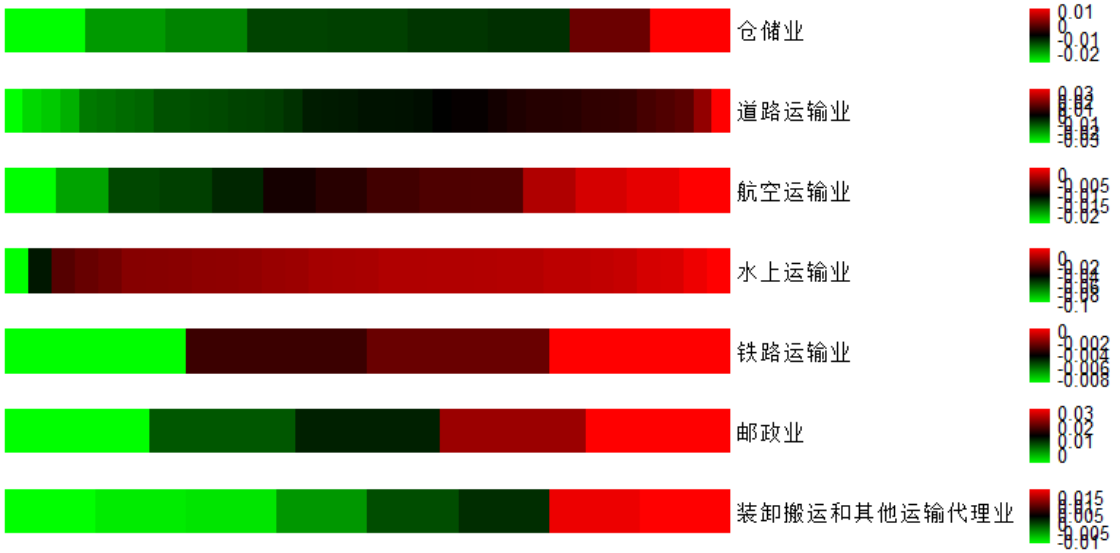
```
#行业与 PE 数据
PE=read.delim(paste(path,"function7.1.txt",sep='/'),header=T)
#数据：function7.1.txt
#数据来源：RESSET 数据库—RESSET 股票—市盈率—行业市盈率_2001 年证监会行业标准—证监会门类行业市盈率
#csrciccd1      证监会行业门类代码      First Level Code of Csrc Ic
#csrcicnm1      证监会行业门类名称      First Level Name of Csrc Ic
#peratio_ind      行业市盈率      Price-to-earning Ratio of Industry
#comnum      公司数      Company Number
#行业与市值数据
DMV=read.delim(paste(path,"function7.2.txt",sep='/'),header=T)
#数据：function7.2.txt
#数据来源：RESSET 数据库—RESSET 股票—市值—行业市值—证监会门类行业日市值
#csrciccd1      证监会行业门类代码      First Level Code of Csrc Ic
#dmc_ind      行业日总市值      Industry Daily Market Capitalization
stock=read.delim(paste(path,"function7.3.txt",sep='/'),header=T)
#数据：function7.3.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#csrciccd1      证监会行业门类代码      First Level Code of Csrc Ic
#csrciccd2      证监会行业大类代码      Second Level Code of Csrc Ic
#trdvol      成交量      Trading Volume
#dret      日收益率      Daily Return
stock<-stock[complete.cases(stock$trdvol),]%>%
  arrange(csrciccd1)
Volume<-tapply(stock$trdvol,factor(stock$csrciccd1),sum)
Change<-paste(round((tapply(stock$dret,factor(stock$csrciccd1),sum)/PE$comnum
*100),2),'%',sep='')
table<-data.frame(No.=PE$csrciccd1,Name=PE$csrcicnm1,Stock=PE$comnum,MarketCa
p=DMV$dmc_ind,PE=PE$peratio_ind,Change,Volume)
kable(table,align='c',table.attr = "class=\"table table-bordered\"",digits =
2,row.names = F)
```

No.	Name	Stock	MarketCap	PE	Change	Volume
A	农、林、牧、渔业	28	5.986141e+11	49.94	-0.38%	295318045
B	采矿业	57	2.885867e+12	32.82	-0.62%	838374817
C	制造业	1834	2.490448e+13	41.18	-1.29%	17196475537
D	电力、热力、燃气及水生产和供应业	89	1.834393e+12	28.01	-0.91%	760056457
E	建筑业	79	1.240129e+12	29.73	-0.52%	604308041
F	批发和零售业	140	1.371152e+12	30.74	-1.06%	1102022496
G	交通运输、仓储和邮政业	102	1.947999e+12	25.76	-0.63%	692739146
H	住宿和餐饮业	6	5.699310e+10	38.49	-0.81%	18216630
I	信息传输、软件和信息技术服务业	205	2.876675e+12	58.73	-2.27%	3104413447
J	金融业	93	1.169169e+13	28.55	-2.3%	2635393104
K	房地产业	110	1.984861e+12	22.12	-0.74%	868452256
L	租赁和商务服务业	38	6.038786e+11	40.68	-2.12%	449408713
M	科学研究和技术服务业	46	4.080111e+11	42.82	-1.09%	192840594
N	水利、环境和公共设施管理业	47	2.956607e+11	33.91	-1.28%	236279053
P	教育	5	1.387080e+11	89.49	-0.34%	30362179
Q	卫生和社会工作	7	3.060222e+11	85.61	1.49%	145755367
R	文化、体育和娱乐业	38	5.442433e+11	34.91	-2.48%	563360723
S	综合	12	1.206573e+11	44.31	-1.64%	137571809

功能 8：绘制细分行业内个股收益热度图

绘制各行业股票涨跌热度图，收益率低→高：绿-黑-红。

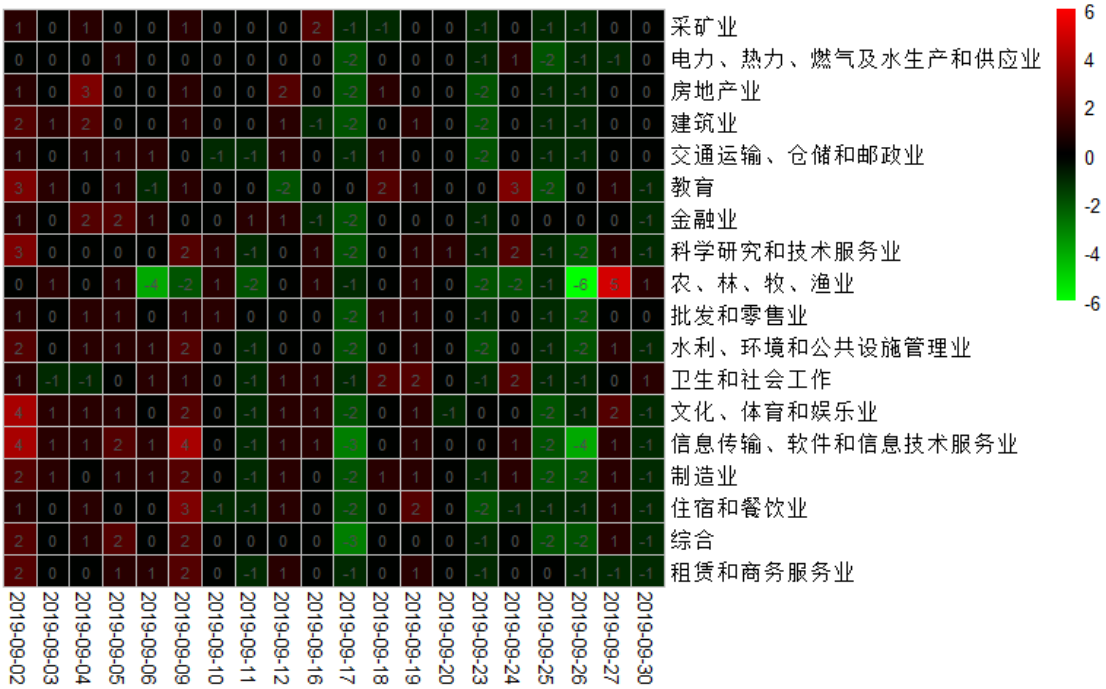
```
# 功能 8：绘制热度图
# 选择细分行业：如 G-交通运输、仓储和邮政业
data_ind <- subset(data_raw, csrciccd1 == 'G')
data2<-spread(data_ind,csrcicnm2,dret) %>%
  subset(select=c(-stkcd,-csrciccd1,-csrcicnm1,-csrciccd2,-dmc))
data2<-t(data.frame(data2,row.names=1))
num=0
plots <- list()
for (i in rownames(data2)){
  subdata1=data2[i,]
  a<-na.omit(subdata1)
  b<-sort(as.numeric(a))
  if (length(b)>1){
    num=num+1
    plot <- paste("plot",num,sep = "")
    ma=matrix(t(b),1,length(b))
    rownames(ma) = i #细分行业名称
    plots[[num]]<-pheatmap(ma,cluster_rows = F,cluster_cols = F,show_rownames
=T,border=NA,silent=T,
                           color=colorRampPalette(c("green","black","red"))(1
000))$gtable
  }
}
require(cowplot)
theme_set(theme_cowplot(font_size=8)) # reduce default font size
plot_grid(plotlist = plots,ncol=1,align="v",scale=rep(0.8,times=num))
```



功能 9：绘制细分行业内个股收益月度每日热度图

绘制一个月内各交易日的行业涨跌热度图，收益率低→高：绿-黑-红。

```
Return=read.delim(paste(path,"function9.1.txt",sep='/'),header=T)
#数据：function9.1.txt
#数据来源：RESSET 数据库—RESSET 股票—股票综合数据—日股票综合数据
#comcd      上市公司代码      Listed Company Code
#csrciccd1      证监会行业门类代码      First Level Code of Csrc Ic
#csrciccd2      证监会行业大类代码      Second Level Code of Csrc Ic
#date      日期      Date
#dret      日收益率      Daily Return
DMV=read.delim(paste(path,"function9.2.txt",sep='/'),header=T)
#数据：function9.2.txt
#数据来源：RESSET 数据库—RESSET 股票—市值—日市值
#comcd      上市公司代码      Listed Company Code
#csrciccd1      证监会行业门类代码      First Level Code of Csrc Ic
#csrciccd2      证监会行业大类代码      Second Level Code of Csrc Ic
#date      日期      Date
#dmc      日总市值      Daily Market Capitalization
data_1<-inner_join(Return,DMV,by=c('comcd','date','csrciccd1'))%>%
  select('comcd','date','csrciccd1','dret','dmc')
# 添加行业名
CSRCIND <- read.delim(paste(path,"function4_CSRCIND.txt",sep='/'),header=T)
 %>%
  subset(select=c(csrciccd1,csrcicnm1)) %>%
  unique()
# 与行业合并
data_1<-merge(data_1,CSRCIND,by="csrciccd1")
data_1$dret<-as.numeric(as.character(data_1$dret))
#处理异常值，降低异常收益对热度图整体颜色区分度的影响
data_1$dret[!( data_1$dret>=-1 & data_1$dret<=1 )]<-NA
data_1<-data_1[complete.cases(data_1$dret),]%>%
  mutate(dret_1=dret*dmc)
a<-tapply(data_1$dmc,list(factor(data_1$date),factor(data_1$csrcicnm1)),sum)
b<-tapply(data_1$dret_1,list(factor(data_1$date),factor(data_1$csrcicnm1)),su
m)
industry_dret<-t(as.matrix(round(b/a*100,0)))
#breaks
bk <- c(seq(-6,-0.1,by=0.01),seq(0,6,by=0.01))
pheatmap(industry_dret,cluster_rows = F,cluster_cols = F,show_rownames=T,
         border_color ='grey',
         color = c(colorRampPalette(colors = c("green","black"))(length(bk)/
2),colorRampPalette(colors = c("black","red"))(length(bk)/2)),
         legend_breaks=seq(-6,6,2), breaks=bk,
         display_numbers = industry_dret,legend = T)
```

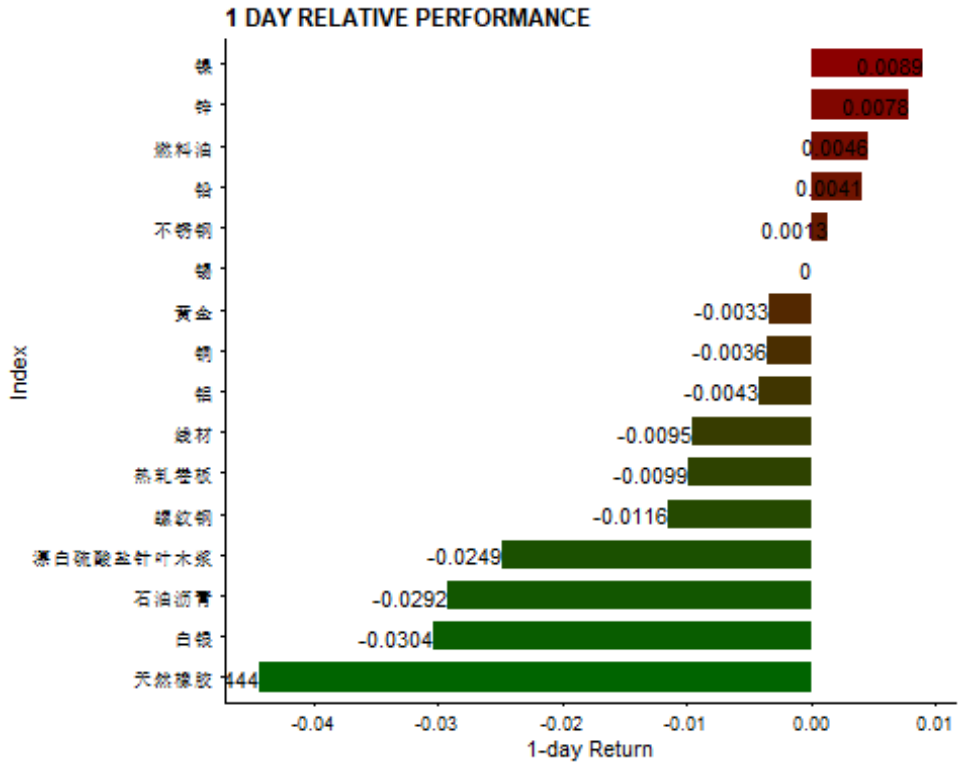


功能 10：期货收益率排名统计

绘制不同标的资产的期货收益率排名条形图，收益率低→高：绿-黑-红。

```
future=read.delim(paste(path,"function10.txt",sep='/'),header=T)
#数据：function10.txt
#数据来源：RESSET 数据库—RESSET 期货—期货交易行情—期货行情表
#enddt       截止日期      End Date
#contnm       合约名称      Contract Name
#conflg       连续标志      Continuum Flag
#contudl       合约标的      Contract Underlying
#contudlnm       合约标的名称      Contract Underlying Name
#clpr       收盘价      Close Price
#trdvol       成交量      Trade Volume
#trdsum       成交额      Trade Sum
#各股指期货收益率统计
future<-future[complete.cases(future$clpr),]
#2019-09-26 期货收益率
future1<-future%>%
  filter(future$enddt=='2019-09-26')
future1<-future1[!duplicated(future1$contnm), ]#去除重复值
#2019-09-27 期货收益率
future2<-future%>%
  filter(future$enddt=='2019-09-27')
future2<-future2[!duplicated(future2$contnm), ]
```

```
future<-inner_join(future1,future2,by='contnm')%>%
  select(contudlnm='contudlnm.x',p_clpr='clpr.x',clpr='clpr.y',exchnm='exchn
m.x')
#选取在上海交易所交易的期货
future<-future%>%
  filter(future$exchnm=='上海期货交易所')
#计算涨跌幅
future<-mutate(future,dret=(future$clpr-future$p_clpr)/future$p_clpr)
future<-future[complete.cases(future$dret),]
future<-future[with(future,order(dret)),]
#绘制期货收益率图
plot10 <- ggplot(future, mapping=aes(x=reorder(contudlnm,dret),y=dret))+
  geom_bar(stat="identity",width=0.7,fill=colorRampPalette(c("darkgreen","dar
kred"))(16))+
  theme(panel.background=element_rect(fill='transparent')) +
  geom_text(mapping = aes(label = round(future$dret, digits = 4)),size=3,vjus
t=0.5,hjust=1) +
  ggtitle("1 DAY RELATIVE PERFORMANCE") +
  labs(y = "1-day Return",x="Index") +
  coord_flip()
plot10
```



功能 11：外汇汇率收益率

绘制外汇涨跌幅排名柱状图，收益率低→高：绿-黑-红。

```
forex=read.delim(paste(path,"function11.txt",sep='/'),header=T)
#数据：function11.txt
#数据来源：RESSET 数据库—RESSET 外汇—汇率行情
#exratecd       汇率代码      Exchange Rate Codedret
#exratenm       汇率名称      Exchange Rate Name
#chgpercg       涨跌幅      Change Percentage
forex$exratecd<-as.character(forex$exratecd)
#筛选美元汇率
forex<-forex%>%
  mutate(code=substr(forex$exratecd,1,3))%>%
  filter(code=='USD')
forex<-forex%>%
  mutate(money=substr(forex$exratecd,5,7))
forex$money[1]="USD"
forex$chgpercg[1]=0#美元兑美元汇率为 1，收益率为 0
df<-data.frame(money=forex$money,chgpercg=forex$chgpercg)
#排序
df<-df[with(df,order(chgpercg)),]
#绘图
plot11 <- ggplot(df, mapping=aes(x=reorder(money,chgpercg),y=chgpercg))+
  geom_bar(stat="identity",width=0.7,fill=colorRampPalette(c("darkgreen","dar
kred"))(23))+
  theme(panel.background=element_rect(fill='transparent')) +
  geom_text(mapping = aes(label = round(df$chgpercg, digits = 4)),size=3,vjus
t=0,hjust=0.5) +
  ggtitle("1 DAY RELATIVE PERFORMANCE[USD]") +
  labs(y = "1-day Return",x="Forex")
plot11
```