```
## Load libraries
library(splines)
library(MASS)
library(xtable)
library(qvalue)
library(ggplot2)

## Warning:  package 'ggplot2' was built under R version 3.3.3

##Source functions
source("../functions.R")
```

Simulations are performed for a variety of alternative distributions:

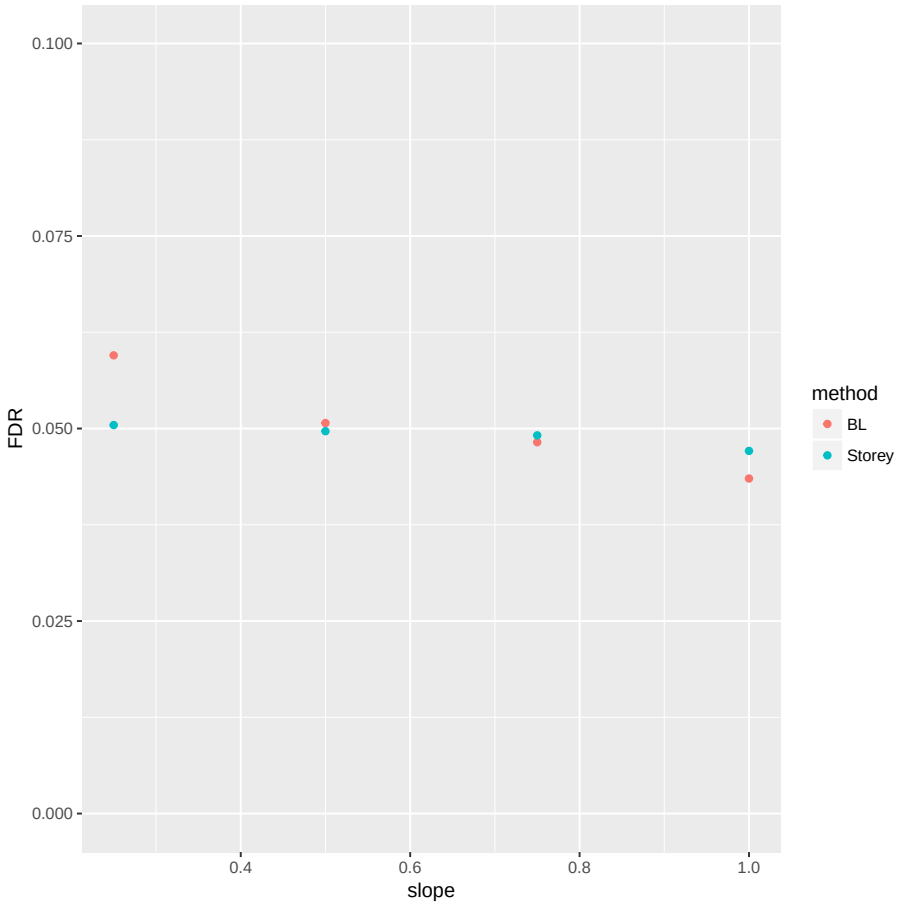
```
alts <- c("alt_beta","alt_chisq_large_3_3","alt_chisq_large",
          "alt_chisq_small_3_3","alt_chisq_small",
          "alt_t_large","alt_t_small",
          "alt_z_large",
          "alt_z_small")
```

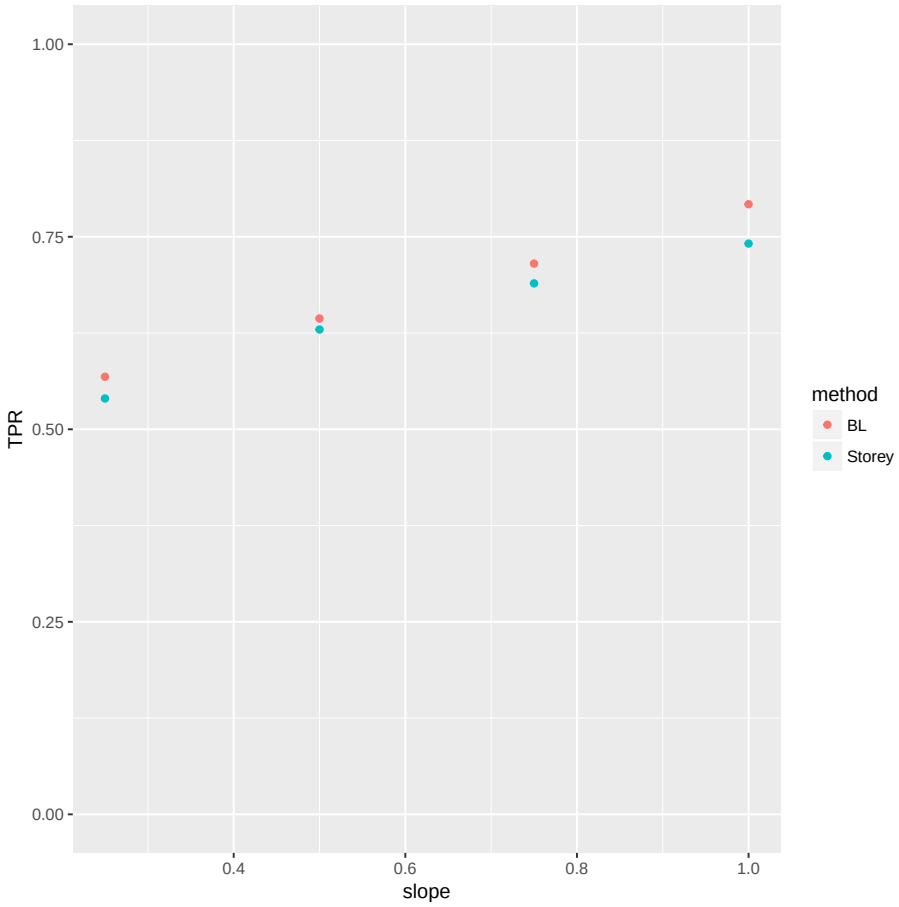
Only focus on z large and t large

```
alt = "alt_z_large"


load(paste(alt,"FDR_TPR_sims_additional.RData",sep="/"))
load(paste(alt,"FDR_TPR_sims_additional_6.RData",sep="/"))
load(paste(alt,"FDR_TPR_sims_additional_7.RData",sep="/"))
load(paste(alt,"FDR_TPR_sims_additional_8.RData",sep="/"))

##get all the values to be plotted in a data frame
FDR.TPR <- data.frame(slope = rep(c(0.25,0.5,0.75,1),each=2),
                      method = rep(c("BL","Storey"), times=4),
                      FDR = c(scen8[c("BL","Storey"),"FDR"],scen7[c("BL","Storey"),"FDR"],
                              scen6[c("BL","Storey"),"FDR"],scen5[c("BL","Storey"),"FDR"]),
                      TPR = c(scen8[c("BL","Storey"),"TPR"],scen7[c("BL","Storey"),"TPR"],
                              scen6[c("BL","Storey"),"TPR"],scen5[c("BL","Storey"),"TPR"]))

FDR.TPR

##   slope method        FDR       TPR
## 1  0.25     BL 0.05950427 0.5682207
## 2  0.25 Storey 0.05044714 0.5400090
## 3  0.50     BL 0.05071310 0.6438547
## 4  0.50 Storey 0.04965365 0.6295688
## 5  0.75     BL 0.04822249 0.7151670
```

```
## 6  0.75 Storey 0.04911128 0.6894753
## 7  1.00     BL 0.04350982 0.7922555
## 8  1.00 Storey 0.04709194 0.7412002
```

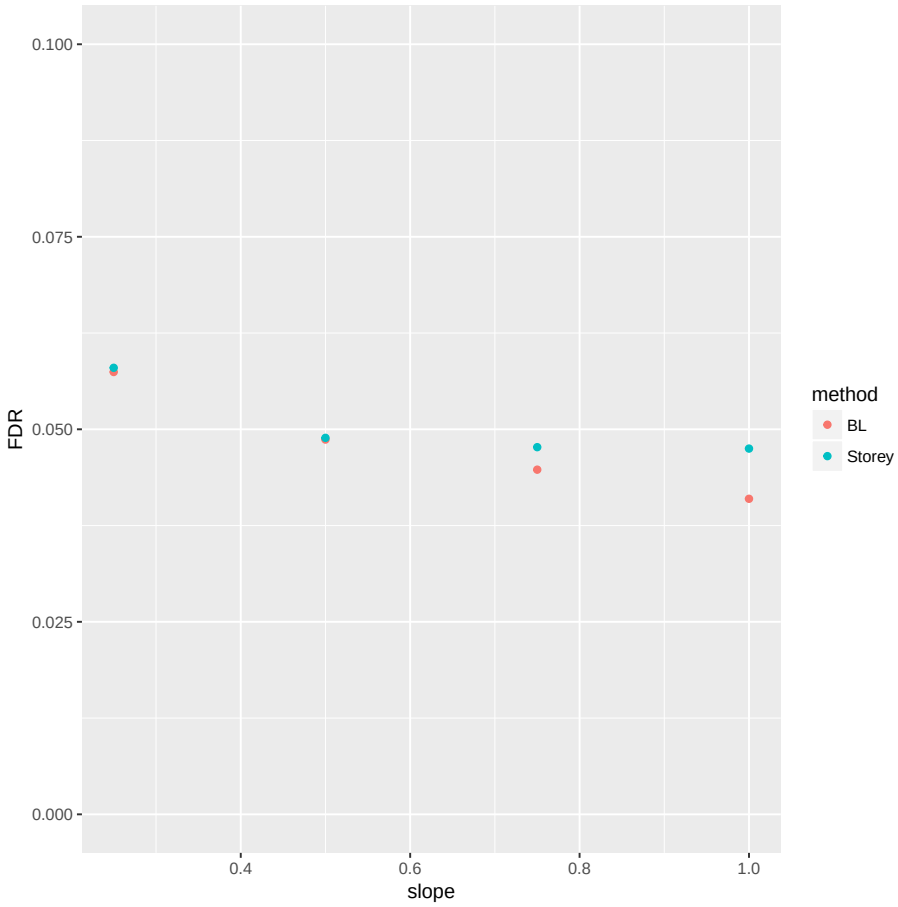
```
ggplot(FDR.TPR, aes(x=slope, y=FDR, color=method)) +
  geom_point() +
  ylim(c(0,0.1))
ggplot(FDR.TPR, aes(x=slope, y=TPR, color=method)) +
  geom_point() +
  ylim(c(0,1))
```

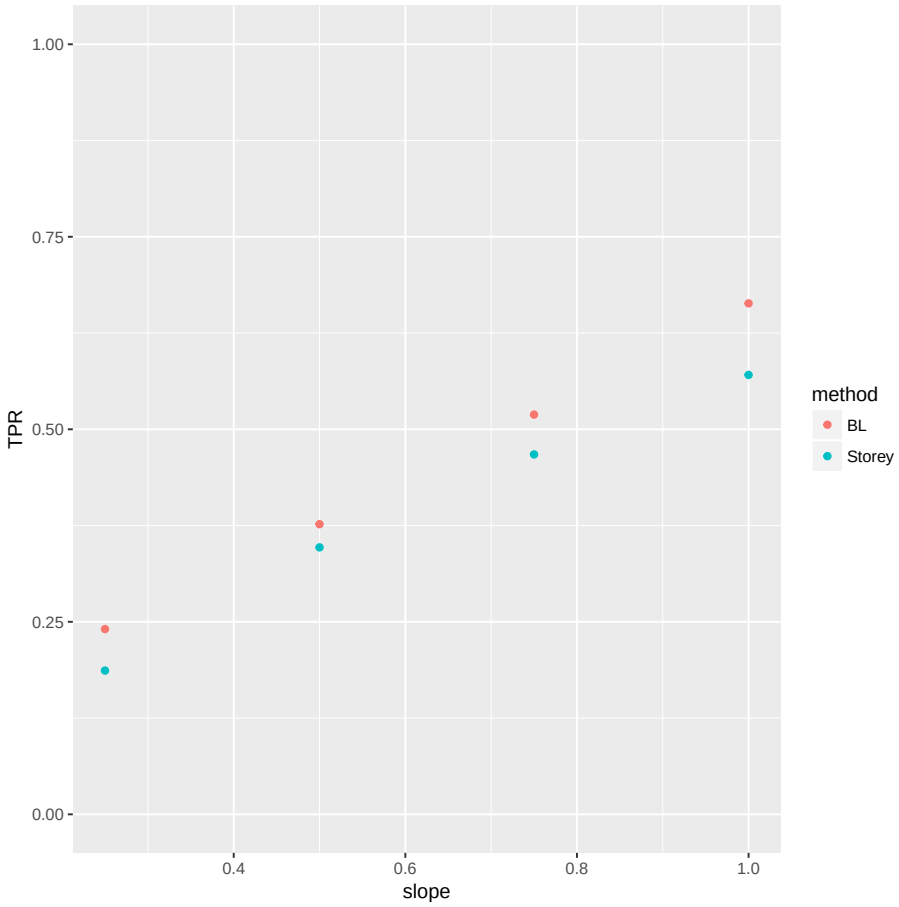





```
alt = "alt_t_large"


load(paste(alt,"FDR_TPR_sims_additional.RData",sep="/"))
load(paste(alt,"FDR_TPR_sims_additional_6.RData",sep="/"))
load(paste(alt,"FDR_TPR_sims_additional_7.RData",sep="/"))
load(paste(alt,"FDR_TPR_sims_additional_8.RData",sep="/"))

##get all the values to be plotted in a data frame
FDR.TPR <- data.frame(slope = rep(c(0.25,0.5,0.75,1),each=2),
                      method = rep(c("BL","Storey"), times=4),
                      FDR = c(scen8[c("BL","Storey"),"FDR"],scen7[c("BL","Storey"),"FDR"],
                              scen6[c("BL","Storey"),"FDR"],scen5[c("BL","Storey"),"FDR"]),
                      TPR = c(scen8[c("BL","Storey"),"TPR"],scen7[c("BL","Storey"),"TPR"],
                              scen6[c("BL","Storey"),"TPR"],scen5[c("BL","Storey"),"TPR"]))
```

```
FDR.TPR

##   slope method        FDR       TPR
## 1  0.25     BL 0.05744178 0.2406273
## 2  0.25 Storey 0.05798580 0.1867077
## 3  0.50     BL 0.04866816 0.3767956
## 4  0.50 Storey 0.04888940 0.3466882
## 5  0.75     BL 0.04475862 0.5190926
## 6  0.75 Storey 0.04768117 0.4673258
## 7  1.00     BL 0.04097697 0.6635325
## 8  1.00 Storey 0.04749691 0.5706391

ggplot(FDR.TPR, aes(x=slope, y=FDR, color=method)) +
  geom_point() +
  ylim(c(0,0.1))
ggplot(FDR.TPR, aes(x=slope, y=TPR, color=method)) +
  geom_point() +
  ylim(c(0,1))
```


0.100
0.075
0.050
0.025
0.000
FDR
0.4
0.6
0.8
1.0
slope
method
BL
Storey



Session info:

```
devtools::session_info()

## Session info -------------------------------------------------

##  setting  value
##  version  R version 3.3.1 (2016-06-21)
##  system   x86_64, mingw32
##  ui       RTerm
##  language (EN)
##  collate  English_United States.1252
##  tz       America/New_York
##  date     2018-08-29

## Packages -----------------------------------------------------

##  package    * version date       source
```

```
##  colorspace   1.2-6   2015-03-11 CRAN (R 3.3.1)
##  devtools     1.12.0  2016-06-24 CRAN (R 3.3.3)
##  digest       0.6.12  2017-01-27 CRAN (R 3.3.3)
##  evaluate     0.10    2016-10-11 CRAN (R 3.3.1)
##  ggplot2    * 2.2.1   2016-12-30 CRAN (R 3.3.3)
##  gtable       0.2.0   2016-02-26 CRAN (R 3.3.1)
##  highr        0.6     2016-05-09 CRAN (R 3.3.1)
##  knitr      * 1.17    2017-08-10 CRAN (R 3.3.3)
##  labeling     0.3     2014-08-23 CRAN (R 3.3.0)
##  lazyeval     0.2.0   2016-06-12 CRAN (R 3.3.1)
##  magrittr     1.5     2014-11-22 CRAN (R 3.3.1)
##  MASS       * 7.3-45  2016-04-21 CRAN (R 3.3.1)
##  memoise      1.0.0   2016-01-29 CRAN (R 3.3.1)
##  munsell      0.4.3   2016-02-13 CRAN (R 3.3.1)
##  plyr         1.8.4   2016-06-08 CRAN (R 3.3.1)
##  qvalue     * 2.4.2   2016-05-16 Bioconductor
##  Rcpp         0.12.13 2017-09-28 CRAN (R 3.3.3)
##  reshape2     1.4.1   2014-12-06 CRAN (R 3.3.1)
##  rlang        0.1.4   2017-11-05 CRAN (R 3.3.3)
##  scales       0.4.1   2016-11-09 CRAN (R 3.3.3)
##  stringi      1.1.1   2016-05-27 CRAN (R 3.3.0)
##  stringr      1.2.0   2017-02-18 CRAN (R 3.3.3)
##  tibble       1.3.3   2017-05-28 CRAN (R 3.3.3)
##  withr        1.0.2   2016-06-20 CRAN (R 3.3.1)
##  xtable     * 1.8-2   2016-02-05 CRAN (R 3.3.1)
```