311306435

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```
r = getOption("repos")
r["CRAN"] = "http://cran.us.r-project.org"
options(repos = r)

install.packages("DirichletReg")
```

```
## Installing package into 'C:/Users/Yuval-PC/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## Warning in download.file(url, destfile, method, mode = "wb", ...): URL
## 'http://cran.us.r-project.org/bin/windows/contrib/4.3/DirichletReg_0.7-1.zip':
## Timeout of 60 seconds was reached
```

```
## Error in download.file(url, destfile, method, mode = "wb", ...) :
##   cannot open URL 'http://cran.us.r-project.org/bin/windows/contrib/4.3/DirichletReg_0.7-1.zip'
```

```
## Warning in download.packages(pkgs, destdir = tmpd, available = available, :
## download of package 'DirichletReg' failed
```

```
install.packages("scatterplot3d") # Install
```

```
## Installing package into 'C:/Users/Yuval-PC/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## package 'scatterplot3d' successfully unpacked and MD5 sums checked
##
## The downloaded binary packages are in
##  C:\Users\Yuval-PC\AppData\Local\Temp\Rtmpw5ByOo\downloaded_packages
```

```
install.packages("MASS")
```

```
## Installing package into 'C:/Users/Yuval-PC/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## package 'MASS' successfully unpacked and MD5 sums checked
```

```
## Warning: cannot remove prior installation of package 'MASS'
```

```
## Warning in file.copy(savedcopy, lib, recursive = TRUE): problem copying
## C:\Users\Yuval-PC\AppData\Local\R\win-library\4.3\00LOCK\MASS\libs\x64\MASS.dll
## to C:\Users\Yuval-PC\AppData\Local\R\win-library\4.3\MASS\libs\x64\MASS.dll:
## Permission denied
```

```
## Warning: restored 'MASS'
```

```
##
## The downloaded binary packages are in
##  C:\Users\Yuval-PC\AppData\Local\Temp\Rtmpw5ByOo\downloaded_packages
```

```
install.packages("MCMCprecision")
```

```
## Installing package into 'C:/Users/Yuval-PC/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## package 'MCMCprecision' successfully unpacked and MD5 sums checked
```

```
## Warning: cannot remove prior installation of package 'MCMCprecision'
```

```
## Warning in file.copy(savedcopy, lib, recursive = TRUE): problem copying
## C:\Users\Yuval-PC\AppData\Local\R\win-library\4.3\00LOCK\MCMCprecision\libs\x64\MCMCprecision.dll
## to
## C:\Users\Yuval-PC\AppData\Local\R\win-library\4.3\MCMCprecision\libs\x64\MCMCprecision.dll:
## Permission denied
```

```
## Warning: restored 'MCMCprecision'
```

```
##
## The downloaded binary packages are in
##  C:\Users\Yuval-PC\AppData\Local\Temp\Rtmpw5ByOo\downloaded_packages
```

```
install.packages("ggpubr")
```

```
## Installing package into 'C:/Users/Yuval-PC/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)
```

```
## Warning in download.file(url, destfile, method, mode = "wb", ...): URL
## 'http://cran.us.r-project.org/bin/windows/contrib/4.3/ggpubr_0.6.0.zip':
## Timeout of 60 seconds was reached
```

```
## Error in download.file(url, destfile, method, mode = "wb", ...) :
##   cannot open URL 'http://cran.us.r-project.org/bin/windows/contrib/4.3/ggpubr_0.6.0.zip'
```

```
## Warning in download.packages(pkgs, destdir = tmpd, available = available, :
## download of package 'ggpubr' failed
```

```
library(gridExtra)
library(ggpubr)
```

```
## Loading required package: ggplot2
```

```
library(cowplot)
```

```
##
## Attaching package: 'cowplot'
```

```
## The following object is masked from 'package:ggpubr':
##
##     get_legend
```

```
require(MCMCprecision)
```

```
## Loading required package: MCMCprecision
```

```
library(Formula)
library(DirichletReg)
```

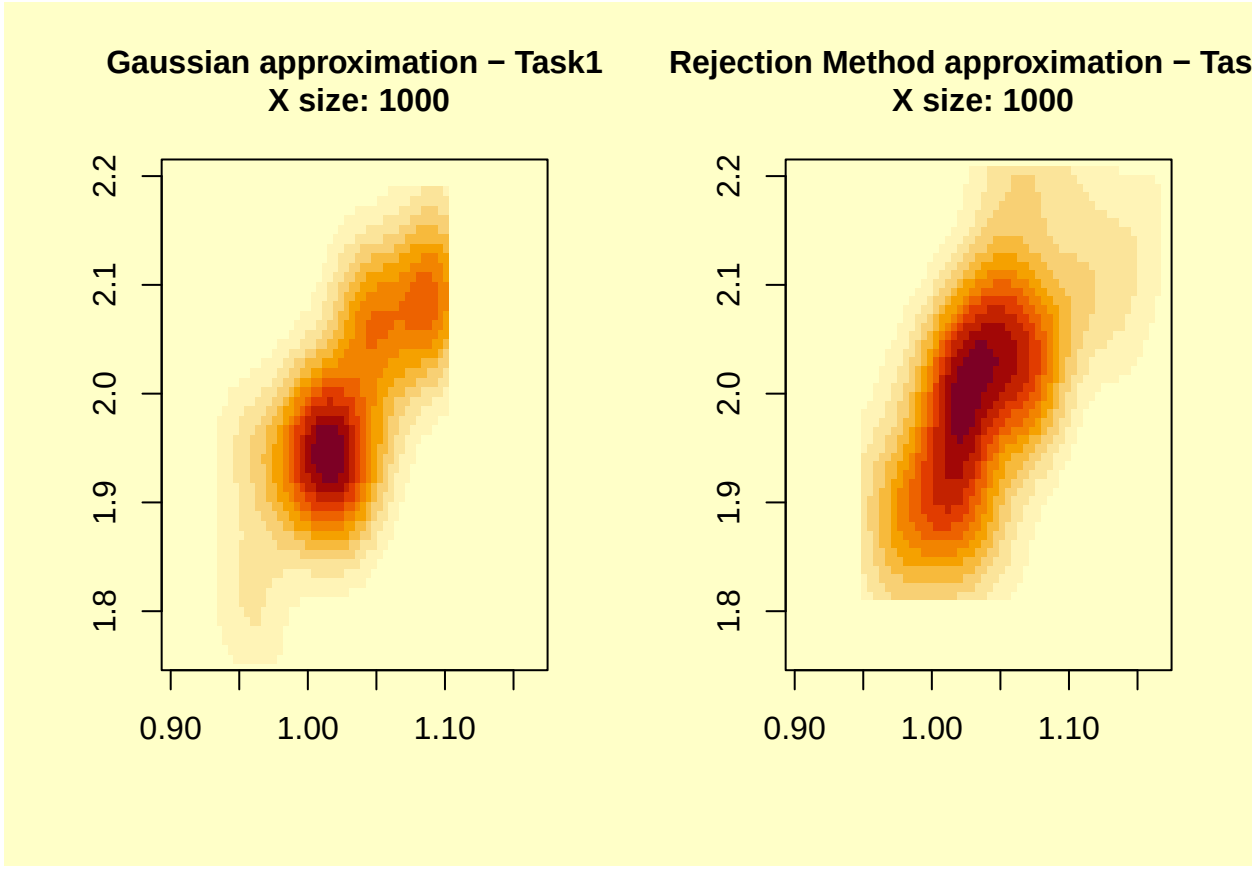
```
##
## Attaching package: 'DirichletReg'
```

```
## The following object is masked from 'package:MCMCprecision':
##
##     rdirichlet
```

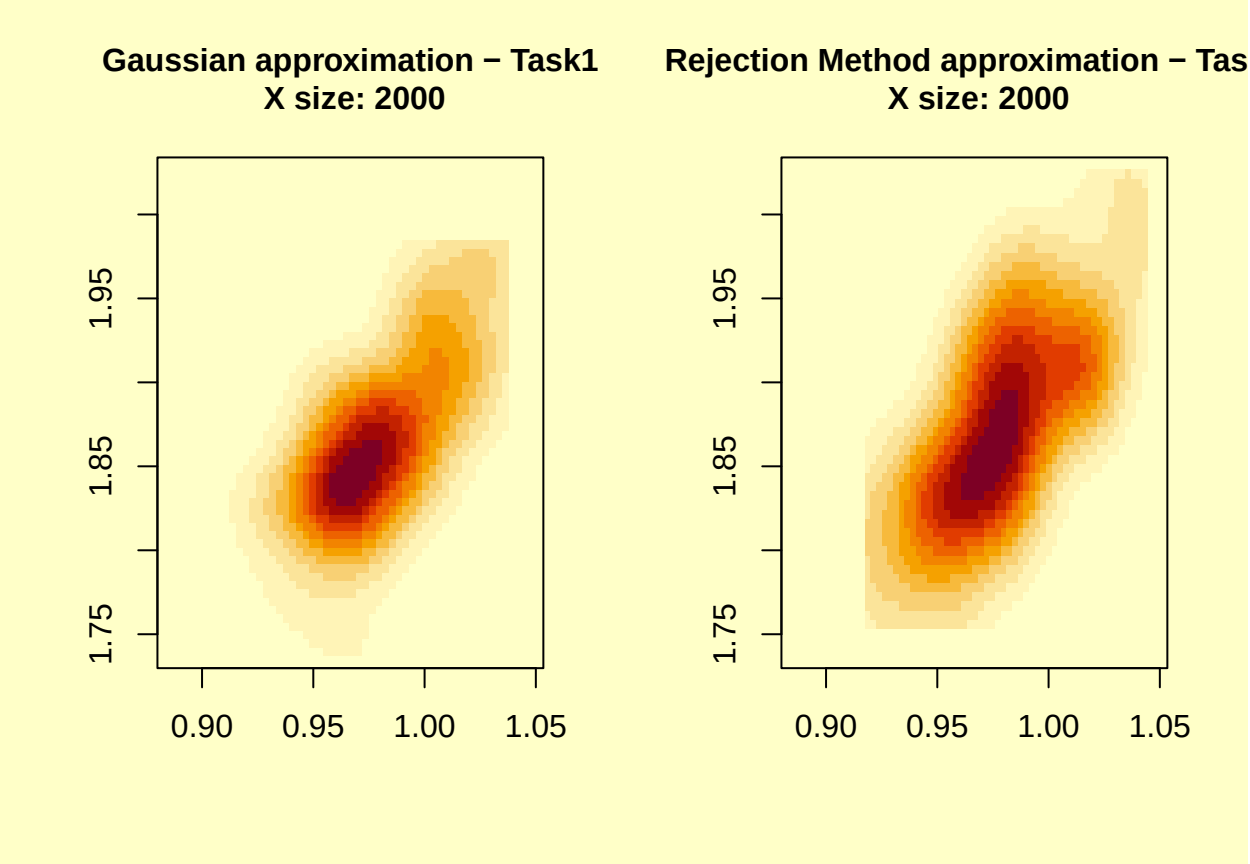
```r
library("scatterplot3d") # load
library(MASS)
```

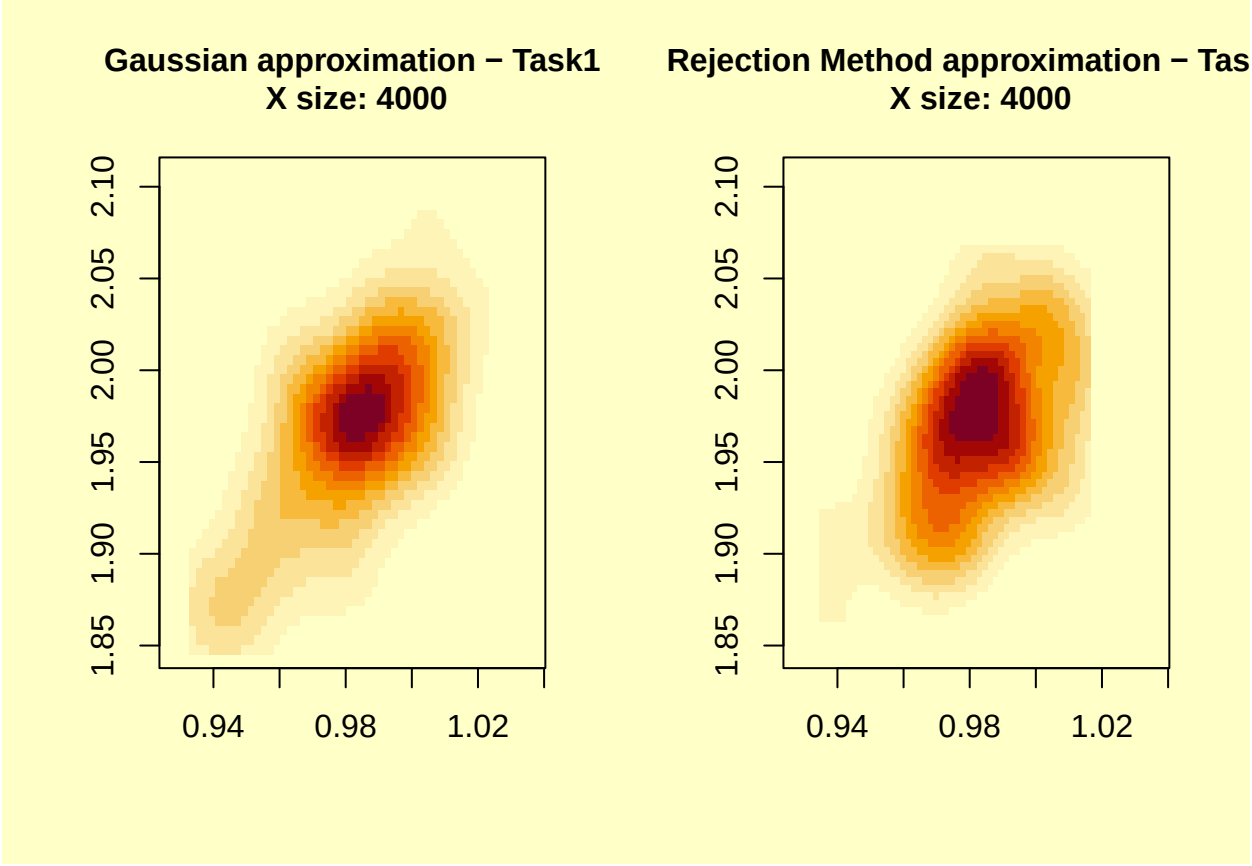
Question 1

Question 2



Question 3

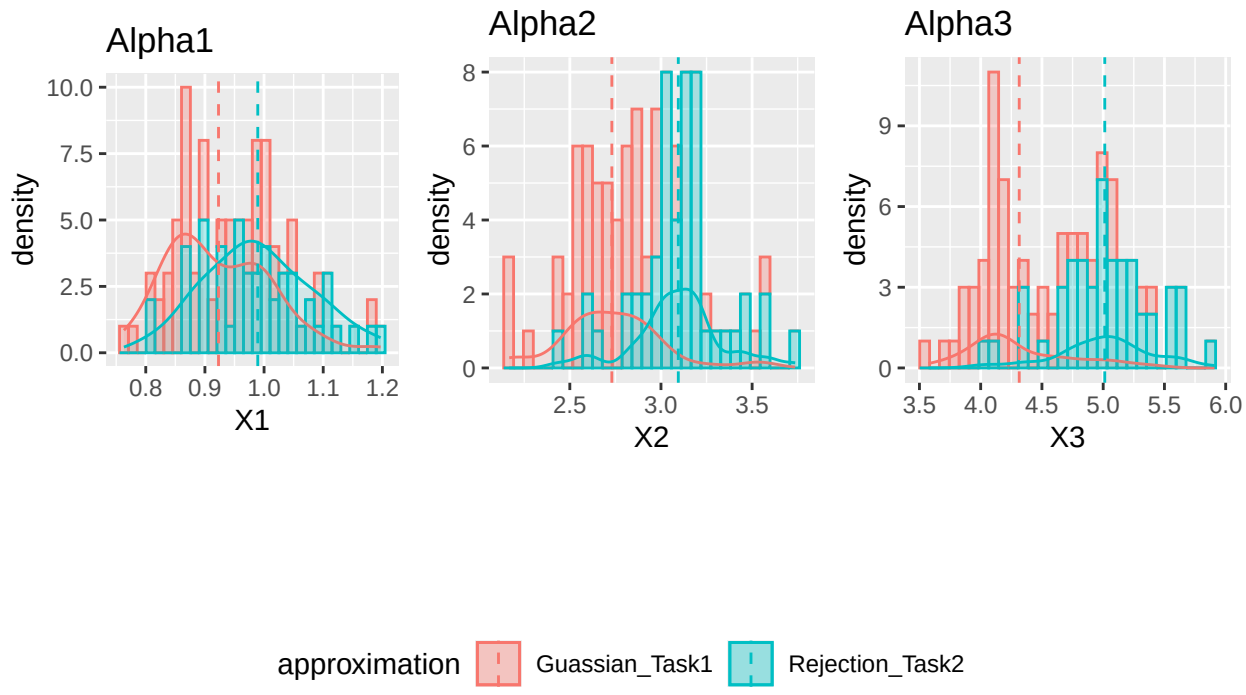

Gaussian approximation − Task1
X size: 2000
Rejection Method approximation − Tas
X size: 2000
1.95
1.85
1.75
0.90
0.95
1.00
1.05



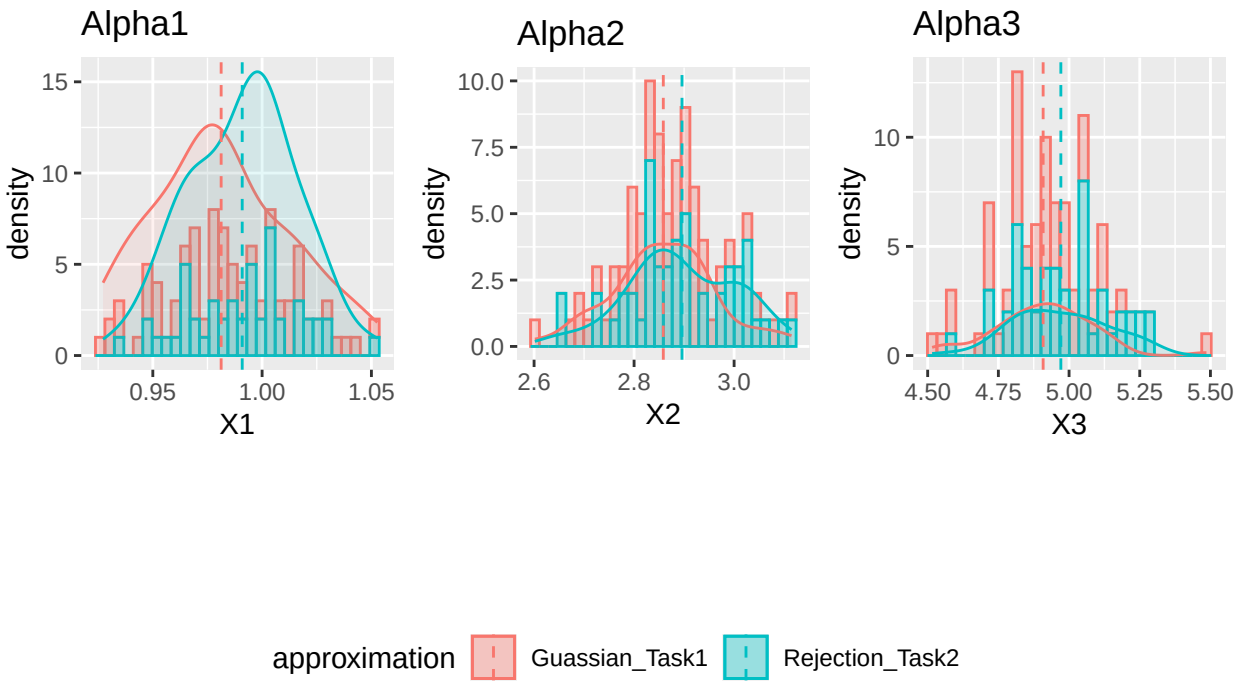

```
rates <- c(1,3,5)
X <- rdirichlet(1000, rates)
q1_alphas <- q1(50, X, rates)
q2_alphas <- q2(50, X, rates)$Alpha
q1_df <- data.frame(q1_alphas)
q1_df$approximation <- "Guassian_Task1"
q2_df <- data.frame(q2_alphas)
q2_df$approximation <- "Rejection_Task2"
df <- rbind(q1_df, q2_df)
```

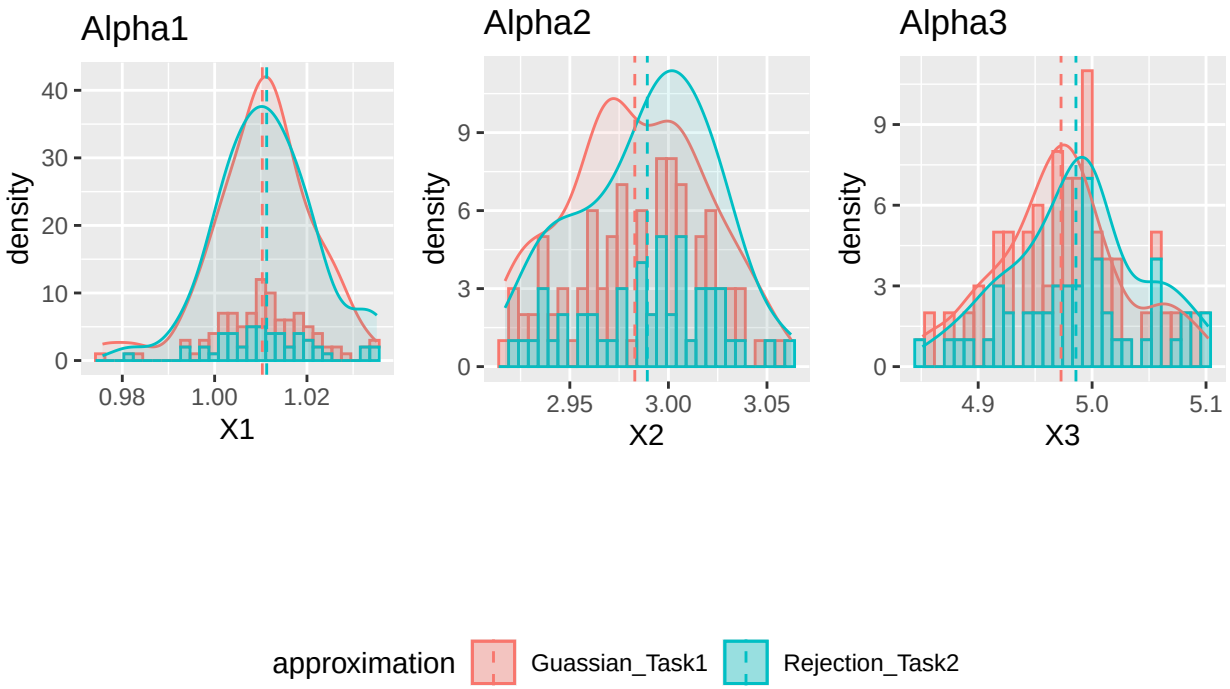
```
## Warning: package 'ggplot2' is in use and will not be installed

## Warning: package 'gridExtra' is in use and will not be installed

## Installing package into 'C:/Users/Yuval-PC/AppData/Local/R/win-library/4.3'
## (as 'lib' is unspecified)

## package 'plyr' successfully unpacked and MD5 sums checked

## Warning: cannot remove prior installation of package 'plyr'

## Warning in file.copy(savedcopy, lib, recursive = TRUE): problem copying
## C:\Users\Yuval-PC\AppData\Local\R\win-library\4.3\00LOCK\plyr\libs\x64\plyr.dll
## to C:\Users\Yuval-PC\AppData\Local\R\win-library\4.3\plyr\libs\x64\plyr.dll:
## Permission denied

## Warning: restored 'plyr'

##
## The downloaded binary packages are in
```

```
##  C:\Users\Yuval-PC\AppData\Local\Temp\Rtmpw5ByOo\downloaded_packages
##
## Attaching package: 'plyr'
## The following object is masked from 'package:ggpubr':
##
##     mutate
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```


Alpha1
density
15
10
5
0
0.95
1.00
1.05
X1
Alpha2
density
10.0
7.5
5.0
2.5
0.0
2.6
2.8
3.0
X2
Alpha3
density
10
5
0
4.50
4.75
5.00
5.25
5.50
X3
approximation
Guassian_Task1
Rejection_Task2


Alpha1
Alpha2
Alpha3
density
X1
X2
X3
approximation
Guassian_Task1
Rejection_Task2