

RQ2: Does the interest differ based on the type of TD?

Yasutaka Kamei

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Read Data

```
setwd("/Users/kamei/Research/techdebt/msr16_td_interest/")
source("./r_scripts/data_read.r")
```

The number of technical debt in each type

```
b <- data.CountLine.all
```

```
tmp <- b[b[, "Project"] == "apache-ant", ]
fc <- factor(tmp$Type)
tapply(tmp$interest, fc, length)
```

```
##      DEFECT      DESIGN REQUIREMENT      TEST
##          9          52          5          5
```

```
tapply(tmp$interest, fc, function(x){length(x)/length(tmp$interest) * 100})
```

```
##      DEFECT      DESIGN REQUIREMENT      TEST
## 12.676056  73.239437   7.042254   7.042254
```

```
tmp <- b[b[, "Project"] == "apache-jmeter", ]
fc <- factor(tmp$Type)
tapply(tmp$interest, fc, length)
```

```
##      DEFECT      DESIGN DOCUMENTATION REQUIREMENT      TEST
##          11          148          2          16          4
```

```
tapply(tmp$interest, fc, function(x){length(x)/length(tmp$interest) * 100})
```

```
##      DEFECT      DESIGN DOCUMENTATION REQUIREMENT      TEST
##  6.077348  81.767956   1.104972   8.839779   2.209945
```

```
tmp <- b[b[, "Project"] == "jruby", ]
fc <- factor(tmp$Type)
tapply(tmp$interest, fc, length)
```

```
##      DEFECT      DESIGN DOCUMENTATION REQUIREMENT      TEST
##          87          108          1          37          3
```

```
tapply(tmp$interest, fc, function(x){length(x)/length(tmp$interest) * 100})
```

```
##          DEFECT          DESIGN DOCUMENTATION  REQUIREMENT          TEST
##    36.8644068    45.7627119    0.4237288    15.6779661    1.2711864
```

Observation

- In jrubby, three types of technical dept are included than 10%.
- We use DEFECT, DESIGN and REQ in jrubby.

Does the interest differ based on the type of TD?

```
tmp <- b[b[, "Project"] == "jrubby", ]
tmp <- tmp[(tmp[, "Type"] == "DEFECT" | tmp[, "Type"] == "DESIGN" | tmp[, "Type"] == "REQUIREMENT"), ]
fc <- factor(tmp$Type)
```

```
tapply(tmp$interest, fc, function(x){c(sum(x==0)/length(x)*100)})
```

```
##          DEFECT          DESIGN REQUIREMENT
##    52.87356    33.33333    45.94595
```

```
tapply(tmp$interest, fc, summary)
```

```
## $DEFECT
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -83.780   0.000   0.000  10.370   8.402  200.000
##
## $DESIGN
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -95.830  -4.944   0.000   4.466   7.853  362.500
##
## $REQUIREMENT
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## -64.710  -2.941   0.000   2.912   0.000   64.440
```

```
defect <- subset(tmp$interest, tmp[, "Type"] == "DEFECT")
design <- subset(tmp$interest, tmp[, "Type"] == "DESIGN")
req <- subset(tmp$interest, tmp[, "Type"] == "REQUIREMENT")
```

```
library(vioplot)
```

```
## Loading required package: sm
```

```
## Package 'sm', version 2.2-5.4: type help(sm) for summary information
```

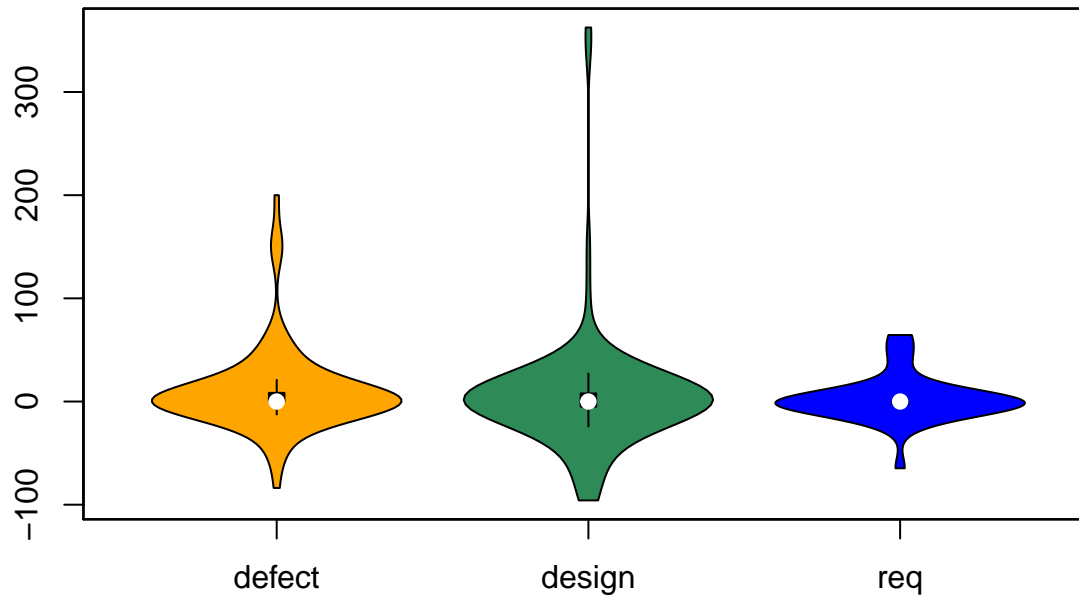
```

plot(0, 0, type = "n", xlab = "", ylab = "", axes = FALSE,
     xlim = c(0.5, 3.5), ylim = range(c(defect, design, req)))

axis(side = 1, at = 1:3, labels = c("defect", "design", "req"))
axis(side = 2)

vioplot(defect, at = 1, col = "orange", add = TRUE)
vioplot(design, at = 2, col = "seagreen", add = TRUE)
vioplot(req, at = 3, col = "blue", add = TRUE)

```



Observation

- There is no difference in each category.