> data<-Base\_With\_AP\_Metrics

> names(data)

[1] "file\_name"

[2] "Number\_of\_Over\_Catches"

[3] "Number\_of\_Catch\_And\_Return\_Null\_AP"

[4] "Number\_of\_Destructive\_Wrapping\_AP"

[5] "Number\_of\_Catch\_and\_Do\_Nothing\_AP"

[6] "Number\_of\_Catch\_Generic\_AP"

[7] "Number\_of\_Dummy\_Handler\_AP"

[8] "Number\_of\_Ignoring\_Interrupted\_Exception\_AP"

[9] "Number\_of\_Log\_and\_Throw\_AP"

[10] "Number\_of\_Mutliline\_log\_AP"

[11] "Number\_of\_Nested\_Try\_AP"

[12] "Number\_of\_Relying\_on\_Get\_Cause\_AP"

[13] "Number\_of\_Throws\_Generic\_AP"

[14] "Number\_of\_Throws\_Kitchen\_Sink\_AP"

[15] "Code\_Ownership\_count"

[16] "lines\_added"

[17] "lines\_deleted"

[18] "Pre\_release\_bugs"

[19] "Post\_release\_bugs"

[20] "AvgCyclomatic"

[21] "AvgCyclomaticModified"

[22] "AvgCyclomaticStrict"

[23] "AvgEssential"

[24] "AvgLine"

[25] "AvgLineBlank"

[26] "AvgLineCode"

[27] "AvgLineComment"

[28] "CountDeclClass"

[29] "CountDeclClassMethod"

[30] "CountDeclClassVariable"

[31] "CountDeclExecutableUnit"

[32] "CountDeclFunction"

[33] "CountDeclInstanceMethod"

[34] "CountDeclInstanceVariable"

[35] "CountDeclMethod"

[36] "CountDeclMethodDefault"

[37] "CountDeclMethodPrivate"

[38] "CountDeclMethodProtected"

[39] "CountDeclMethodPublic"

[40] "CountLine"

[41] "CountLineBlank"

[42] "CountLineCode"

[43] "CountLineCodeDecl"

[44] "CountLineCodeExe"

[45] "CountLineComment"

[46] "CountSemicolon"

[47] "CountStmt"

[48] "CountStmtDecl"

[49] "CountStmtExe"

[50] "MaxCyclomatic"

[51] "MaxCyclomaticModified"

[52] "MaxCyclomaticStrict"

[53] "MaxEssential"

[54] "MaxNesting"

[55] "RatioCommentToCode"

[56] "SumCyclomatic"

[57] "SumCyclomaticModified"

[58] "SumCyclomaticStrict"

[59] "SumEssential"

> summary(data)

file\_name Number\_of\_Over\_Catches Number\_of\_Catch\_And\_Return\_Null\_AP

Length:484 Min. :0.00000 Min. :0.00000

Class :character 1st Qu.:0.00000 1st Qu.:0.00000

Mode :character Median :0.00000 Median :0.00000

Mean :0.09731 Mean :0.04762

3rd Qu.:0.00000 3rd Qu.:0.00000

Max. :8.00000 Max. :6.00000

NA's :1 NA's :1

Number\_of\_Destructive\_Wrapping\_AP Number\_of\_Catch\_and\_Do\_Nothing\_AP

Min. :0.00000 Min. :0.0000

1st Qu.:0.00000 1st Qu.:0.0000

Median :0.00000 Median :0.0000

Mean :0.06418 Mean :0.2133

3rd Qu.:0.00000 3rd Qu.:0.0000

Max. :4.00000 Max. :7.0000

NA's :1 NA's :1

Number\_of\_Catch\_Generic\_AP Number\_of\_Dummy\_Handler\_AP

Min. : 0.000 Min. : 0.0000

1st Qu.: 0.000 1st Qu.: 0.0000

Median : 0.000 Median : 0.0000

Mean : 1.224 Mean : 0.8282

3rd Qu.: 1.000 3rd Qu.: 1.0000

Max. :26.000 Max. :19.0000

NA's :1 NA's :1

Number\_of\_Ignoring\_Interrupted\_Exception\_AP Number\_of\_Log\_and\_Throw\_AP

Min. :0.00000 Min. :0.00000

1st Qu.:0.00000 1st Qu.:0.00000

Median :0.00000 Median :0.00000

Mean :0.01656 Mean :0.07867

3rd Qu.:0.00000 3rd Qu.:0.00000

Max. :2.00000 Max. :5.00000

NA's :1 NA's :1

Number\_of\_Mutliline\_log\_AP Number\_of\_Nested\_Try\_AP

Min. :0.00000 Min. : 0.0000

1st Qu.:0.00000 1st Qu.: 0.0000

Median :0.00000 Median : 0.0000

Mean :0.03313 Mean : 0.1615

3rd Qu.:0.00000 3rd Qu.: 0.0000

Max. :2.00000 Max. :10.0000

NA's :1 NA's :1

Number\_of\_Relying\_on\_Get\_Cause\_AP Number\_of\_Throws\_Generic\_AP

Min. :0.00000 Min. :0.0000

1st Qu.:0.00000 1st Qu.:0.0000

Median :0.00000 Median :0.0000

Mean :0.02899 Mean :0.4037

3rd Qu.:0.00000 3rd Qu.:0.0000

Max. :2.00000 Max. :9.0000

NA's :1 NA's :1

Number\_of\_Throws\_Kitchen\_Sink\_AP Code\_Ownership\_count lines\_added

Min. : 0.00000 Min. : 1.000 Min. : 0.000

1st Qu.: 0.00000 1st Qu.: 4.000 1st Qu.: 0.000

Median : 0.00000 Median : 4.000 Median : 0.000

Mean : 0.09731 Mean : 7.252 Mean : 7.757

3rd Qu.: 0.00000 3rd Qu.:11.000 3rd Qu.: 2.000

Max. :10.00000 Max. :18.000 Max. :544.000

NA's :1 NA's :2

lines\_deleted Pre\_release\_bugs Post\_release\_bugs AvgCyclomatic

Min. : 0.000 Min. :0.00000 Min. : 0.000 Min. : 1.000

1st Qu.: 0.000 1st Qu.:0.00000 1st Qu.: 0.000 1st Qu.: 1.000

Median : 0.000 Median :0.00000 Median : 0.000 Median : 1.000

Mean : 1.237 Mean :0.09731 Mean : 1.197 Mean : 1.874

3rd Qu.: 1.000 3rd Qu.:0.00000 3rd Qu.: 2.000 3rd Qu.: 2.000

Max. :56.000 Max. :4.00000 Max. :23.000 Max. :23.000

NA's :2 NA's :1 NA's :1 NA's :1

AvgCyclomaticModified AvgCyclomaticStrict AvgEssential AvgLine

Min. : 1.000 Min. : 1.000 Min. : 1.000 Min. : 1.00

1st Qu.: 1.000 1st Qu.: 1.000 1st Qu.: 1.000 1st Qu.: 7.00

Median : 1.000 Median : 2.000 Median : 1.000 Median : 9.00

Mean : 1.834 Mean : 2.027 Mean : 1.104 Mean :11.01

3rd Qu.: 2.000 3rd Qu.: 2.000 3rd Qu.: 1.000 3rd Qu.:13.50

Max. :23.000 Max. :33.000 Max. :10.000 Max. :87.00

NA's :1 NA's :1 NA's :1 NA's :1

AvgLineBlank AvgLineCode AvgLineComment CountDeclClass

Min. : 0.0000 Min. : 1.0 Min. : 0.0000 Min. : 0.000

1st Qu.: 0.0000 1st Qu.: 6.0 1st Qu.: 0.0000 1st Qu.: 1.000

Median : 0.0000 Median : 8.0 Median : 0.0000 Median : 2.000

Mean : 0.1988 Mean : 9.3 Mean : 0.9772 Mean : 3.433

3rd Qu.: 0.0000 3rd Qu.:11.0 3rd Qu.: 1.5000 3rd Qu.: 4.000

Max. :10.0000 Max. :66.0 Max. :19.0000 Max. :46.000

NA's :1 NA's :1 NA's :1 NA's :1

CountDeclClassMethod CountDeclClassVariable CountDeclExecutableUnit

Min. : 0.000 Min. : 0.000 Min. : 0.00

1st Qu.: 0.000 1st Qu.: 0.000 1st Qu.: 7.00

Median : 0.000 Median : 1.000 Median : 14.00

Mean : 2.416 Mean : 2.795 Mean : 23.22

3rd Qu.: 2.000 3rd Qu.: 3.000 3rd Qu.: 27.00

Max. :117.000 Max. :70.000 Max. :269.00

NA's :1 NA's :1 NA's :1

CountDeclFunction CountDeclInstanceMethod CountDeclInstanceVariable

Min. : 1.00 Min. : 0.0 Min. : 0.000

1st Qu.: 7.00 1st Qu.: 5.0 1st Qu.: 2.000

Median : 14.00 Median : 12.0 Median : 5.000

Mean : 23.75 Mean : 19.9 Mean : 8.217

3rd Qu.: 28.00 3rd Qu.: 25.5 3rd Qu.:11.000

Max. :269.00 Max. :229.0 Max. :78.000

NA's :3 NA's :1 NA's :1

CountDeclMethod CountDeclMethodDefault CountDeclMethodPrivate

Min. : 1.00 Min. : 0.000 Min. : 0.000

1st Qu.: 7.00 1st Qu.: 0.000 1st Qu.: 0.000

Median : 14.00 Median : 1.000 Median : 1.000

Mean : 22.31 Mean : 2.323 Mean : 2.652

3rd Qu.: 27.00 3rd Qu.: 3.000 3rd Qu.: 3.000

Max. :233.00 Max. :32.000 Max. :65.000

NA's :1 NA's :1 NA's :1

CountDeclMethodProtected CountDeclMethodPublic CountLine CountLineBlank

Min. : 0.000 Min. : 0.00 Min. : 36.0 Min. : 3.00

1st Qu.: 0.000 1st Qu.: 3.00 1st Qu.: 125.0 1st Qu.: 15.00

Median : 0.000 Median : 8.00 Median : 227.0 Median : 26.00

Mean : 1.919 Mean : 15.42 Mean : 346.6 Mean : 39.07

3rd Qu.: 3.000 3rd Qu.: 19.00 3rd Qu.: 404.0 3rd Qu.: 46.50

Max. :34.000 Max. :168.00 Max. :3415.0 Max. :284.00

NA's :1 NA's :1 NA's :1 NA's :1

CountLineCode CountLineCodeDecl CountLineCodeExe CountLineComment

Min. : 13.0 Min. : 6.00 Min. : 1.0 Min. : 8.00

1st Qu.: 82.0 1st Qu.: 33.00 1st Qu.: 35.0 1st Qu.: 24.00

Median : 152.0 Median : 59.00 Median : 76.0 Median : 37.00

Mean : 245.4 Mean : 87.73 Mean : 133.5 Mean : 63.73

3rd Qu.: 284.0 3rd Qu.:105.00 3rd Qu.: 160.0 3rd Qu.: 64.00

Max. :2408.0 Max. :717.00 Max. :1429.0 Max. :953.00

NA's :1 NA's :1 NA's :1 NA's :1

CountSemicolon CountStmt CountStmtDecl CountStmtExe

Min. : 5.0 Min. : 9.0 Min. : 6.00 Min. : 1.00

1st Qu.: 40.5 1st Qu.: 57.0 1st Qu.: 31.00 1st Qu.: 24.00

Median : 76.0 Median : 106.0 Median : 54.00 Median : 54.00

Mean : 121.3 Mean : 171.5 Mean : 80.06 Mean : 91.47

3rd Qu.: 145.0 3rd Qu.: 207.5 3rd Qu.: 96.00 3rd Qu.:114.50

Max. :1130.0 Max. :1576.0 Max. :625.00 Max. :951.00

NA's :1 NA's :1 NA's :1 NA's :1

MaxCyclomatic MaxCyclomaticModified MaxCyclomaticStrict MaxEssential

Min. : 1.00 Min. : 1.000 Min. : 1.000 Min. : 1.0

1st Qu.: 4.00 1st Qu.: 3.000 1st Qu.: 4.000 1st Qu.: 1.0

Median : 6.00 Median : 6.000 Median : 7.000 Median : 3.0

Mean : 8.64 Mean : 8.395 Mean : 9.888 Mean : 3.7

3rd Qu.:11.00 3rd Qu.:10.000 3rd Qu.: 12.500 3rd Qu.: 5.0

Max. :86.00 Max. :86.000 Max. :160.000 Max. :56.0

NA's :1 NA's :1 NA's :1 NA's :1

MaxNesting RatioCommentToCode SumCyclomatic SumCyclomaticModified

Min. :0.000 Min. :0.0000 Min. : 0.00 Min. : 0.00

1st Qu.:2.000 1st Qu.:0.1700 1st Qu.: 14.00 1st Qu.: 14.00

Median :3.000 Median :0.2800 Median : 28.00 Median : 27.00

Mean :2.803 Mean :0.3655 Mean : 47.76 Mean : 47.22

3rd Qu.:4.000 3rd Qu.:0.4600 3rd Qu.: 55.50 3rd Qu.: 55.50

Max. :8.000 Max. :3.4700 Max. :468.00 Max. :460.00

NA's :1 NA's :1 NA's :1 NA's :1

SumCyclomaticStrict SumEssential

Min. : 0.00 Min. : 0.00

1st Qu.: 15.00 1st Qu.: 8.00

Median : 30.00 Median : 18.00

Mean : 51.37 Mean : 28.65

3rd Qu.: 59.50 3rd Qu.: 34.00

Max. :525.00 Max. :302.00

NA's :1 NA's :1

|  |
| --- |
| data$Code\_Ownership\_count<-as.numeric(data$Code\_Ownership\_count)  > data$lines\_added<-as.numeric(data$lines\_added)  > data$lines\_deleted<-as.numeric(data$lines\_deleted)  > str(data)  tibble [484 × 59] (S3: tbl\_df/tbl/data.frame)  $ file\_name : chr [1:484] "C:\\Users\\ktanu\\Downloads\\elasticsearch-2.4.0\\plugins\\analysis-icu\\src\\main\\java\\org\\elasticsearch\\i"| \_\_truncated\_\_ "C:\\Users\\ktanu\\Downloads\\elasticsearch-2.4.0\\plugins\\analysis-icu\\src\\main\\java\\org\\elasticsearch\\i"| \_\_truncated\_\_ "C:\\Users\\ktanu\\Downloads\\elasticsearch-2.4.0\\plugins\\analysis-kuromoji\\src\\main\\java\\org\\elasticsear"| \_\_truncated\_\_ "C:\\Users\\ktanu\\Downloads\\elasticsearch-2.4.0\\plugins\\analysis-stempel\\src\\main\\java\\org\\elasticsearc"| \_\_truncated\_\_ ...  $ Number\_of\_Over\_Catches : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Catch\_And\_Return\_Null\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Destructive\_Wrapping\_AP : num [1:484] 0 0 0 0 0 0 0 0 1 0 ...  $ Number\_of\_Catch\_and\_Do\_Nothing\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Catch\_Generic\_AP : num [1:484] 0 1 0 0 0 0 0 0 1 0 ...  $ Number\_of\_Dummy\_Handler\_AP : num [1:484] 0 0 0 0 0 1 0 1 0 1 ...  $ Number\_of\_Ignoring\_Interrupted\_Exception\_AP: num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Log\_and\_Throw\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Mutliline\_log\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Nested\_Try\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Relying\_on\_Get\_Cause\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Number\_of\_Throws\_Generic\_AP : num [1:484] 0 0 0 0 0 0 0 0 1 0 ...  $ Number\_of\_Throws\_Kitchen\_Sink\_AP : num [1:484] 0 0 0 0 0 0 0 0 0 0 ...  $ Code\_Ownership\_count : num [1:484] 4 7 13 13 8 6 6 6 6 7 ...  $ lines\_added : num [1:484] 0 0 0 0 0 4 6 0 1 0 ...  $ lines\_deleted : num [1:484] 0 0 0 0 0 8 1 0 2 0 ...  $ Pre\_release\_bugs : num [1:484] 0 0 0 0 0 1 1 0 0 0 ...  $ Post\_release\_bugs : num [1:484] 0 0 0 0 0 3 2 0 3 0 ...  $ AvgCyclomatic : num [1:484] 2 14 4 1 2 1 4 2 2 1 ...  $ AvgCyclomaticModified : num [1:484] 2 14 4 1 2 1 4 2 2 1 ...  $ AvgCyclomaticStrict : num [1:484] 2 14 4 1 2 1 6 2 2 1 ...  $ AvgEssential : num [1:484] 1 1 1 1 2 1 2 1 1 1 ...  $ AvgLine : num [1:484] 16 60 15 3 11 7 19 9 10 6 ...  $ AvgLineBlank : num [1:484] 0 5 0 0 0 0 1 0 0 0 ...  $ AvgLineCode : num [1:484] 13 54 15 3 10 6 17 6 9 6 ...  $ AvgLineComment : num [1:484] 3 1 0 0 1 1 0 2 0 0 ...  $ CountDeclClass : num [1:484] 1 1 1 1 1 1 1 1 1 4 ...  $ CountDeclClassMethod : num [1:484] 0 0 2 0 14 2 1 2 3 2 ...  $ CountDeclClassVariable : num [1:484] 0 0 4 0 1 1 0 1 2 0 ...  $ CountDeclExecutableUnit : num [1:484] 2 2 4 2 14 10 8 3 43 17 ...  $ CountDeclFunction : num [1:484] 2 2 4 2 14 10 8 3 43 17 ...  $ CountDeclInstanceMethod : num [1:484] 2 2 2 2 0 5 7 1 18 15 ...  $ CountDeclInstanceVariable : num [1:484] 3 1 5 0 0 1 1 0 2 12 ...  $ CountDeclMethod : num [1:484] 2 2 4 2 14 7 8 3 21 17 ...  $ CountDeclMethodDefault : num [1:484] 0 0 0 0 0 3 0 0 6 3 ...  $ CountDeclMethodPrivate : num [1:484] 0 0 0 0 2 1 3 1 5 0 ...  $ CountDeclMethodProtected : num [1:484] 0 0 0 0 0 0 3 1 0 0 ...  $ CountDeclMethodPublic : num [1:484] 2 2 4 2 12 3 2 1 10 14 ...  $ CountLine : num [1:484] 109 177 120 43 299 131 220 62 477 190 ...  $ CountLineBlank : num [1:484] 6 18 12 8 25 14 27 9 48 36 ...  $ CountLineCode : num [1:484] 41 125 89 17 233 85 164 28 379 133 ...  $ CountLineCodeDecl : num [1:484] 20 34 39 12 100 41 47 10 124 59 ...  $ CountLineCodeExe : num [1:484] 22 83 48 2 123 43 104 12 227 58 ...  $ CountLineComment : num [1:484] 62 34 19 18 41 32 29 25 50 21 ...  $ CountSemicolon : num [1:484] 23 62 53 11 114 49 81 12 195 70 ...  $ CountStmt : num [1:484] 29 91 72 14 150 63 120 19 262 96 ...  $ CountStmtDecl : num [1:484] 17 33 40 12 95 35 41 10 110 54 ...  $ CountStmtExe : num [1:484] 12 58 32 2 55 28 79 9 152 42 ...  $ MaxCyclomatic : num [1:484] 3 27 8 1 5 2 13 3 9 4 ...  $ MaxCyclomaticModified : num [1:484] 3 27 8 1 5 2 13 3 9 4 ...  $ MaxCyclomaticStrict : num [1:484] 3 27 10 1 5 2 22 3 10 5 ...  $ MaxEssential : num [1:484] 1 1 3 1 5 1 13 1 4 4 ...  $ MaxNesting : num [1:484] 2 4 4 0 3 1 2 1 3 2 ...  $ RatioCommentToCode : num [1:484] 1.51 0.27 0.21 1.06 0.18 0.38 0.18 0.89 0.13 0.16 ...  $ SumCyclomatic : num [1:484] 5 28 16 2 35 16 37 6 86 23 ...  $ SumCyclomaticModified : num [1:484] 5 28 16 2 35 16 37 6 86 23 ...  $ SumCyclomaticStrict : num [1:484] 5 28 18 2 37 16 49 6 88 25 ...  $ SumEssential : num [1:484] 2 2 6 2 30 10 20 3 52 22 ...  > nrow(data)  [1] 484  > drop=c("file\_name","Post\_release\_bugs")  >  > independant=data[,!(names(data) %in% drop)]  > names(independant)  [1] "Number\_of\_Over\_Catches"  [2] "Number\_of\_Catch\_And\_Return\_Null\_AP"  [3] "Number\_of\_Destructive\_Wrapping\_AP"  [4] "Number\_of\_Catch\_and\_Do\_Nothing\_AP"  [5] "Number\_of\_Catch\_Generic\_AP"  [6] "Number\_of\_Dummy\_Handler\_AP"  [7] "Number\_of\_Ignoring\_Interrupted\_Exception\_AP"  [8] "Number\_of\_Log\_and\_Throw\_AP"  [9] "Number\_of\_Mutliline\_log\_AP"  [10] "Number\_of\_Nested\_Try\_AP"  [11] "Number\_of\_Relying\_on\_Get\_Cause\_AP"  [12] "Number\_of\_Throws\_Generic\_AP"  [13] "Number\_of\_Throws\_Kitchen\_Sink\_AP"  [14] "Code\_Ownership\_count"  [15] "lines\_added"  [16] "lines\_deleted"  [17] "Pre\_release\_bugs"  [18] "AvgCyclomatic"  [19] "AvgCyclomaticModified"  [20] "AvgCyclomaticStrict"  [21] "AvgEssential"  [22] "AvgLine"  [23] "AvgLineBlank"  [24] "AvgLineCode"  [25] "AvgLineComment"  [26] "CountDeclClass"  [27] "CountDeclClassMethod"  [28] "CountDeclClassVariable"  [29] "CountDeclExecutableUnit"  [30] "CountDeclFunction"  [31] "CountDeclInstanceMethod"  [32] "CountDeclInstanceVariable"  [33] "CountDeclMethod"  [34] "CountDeclMethodDefault"  [35] "CountDeclMethodPrivate"  [36] "CountDeclMethodProtected"  [37] "CountDeclMethodPublic"  [38] "CountLine"  [39] "CountLineBlank"  [40] "CountLineCode"  [41] "CountLineCodeDecl"  [42] "CountLineCodeExe"  [43] "CountLineComment"  [44] "CountSemicolon"  [45] "CountStmt"  [46] "CountStmtDecl"  [47] "CountStmtExe"  [48] "MaxCyclomatic"  [49] "MaxCyclomaticModified"  [50] "MaxCyclomaticStrict"  [51] "MaxEssential"  [52] "MaxNesting"  [53] "RatioCommentToCode"  [54] "SumCyclomatic"  [55] "SumCyclomaticModified"  [56] "SumCyclomaticStrict"  [57] "SumEssential" |
|  |
| |  | | --- | | > | |

> zv <- apply(independant, 2, function(independant) length(unique(independant)) == 1)

> dfr <- independant[, !zv]

> n=length(colnames(dfr))

> correlationMatrix <- cor(dfr[,1:n],method="spearman",use="complete.obs")

> correlationMatrix

Number\_of\_Over\_Catches

Number\_of\_Over\_Catches 1.000000000

Number\_of\_Catch\_And\_Return\_Null\_AP -0.036450023

Number\_of\_Destructive\_Wrapping\_AP -0.044473754

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.076575451

Number\_of\_Catch\_Generic\_AP 0.094740650

Number\_of\_Dummy\_Handler\_AP -0.097889881

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.024690788

Number\_of\_Log\_and\_Throw\_AP 0.086726704

Number\_of\_Mutliline\_log\_AP -0.031081590

Number\_of\_Nested\_Try\_AP -0.010358396

Number\_of\_Relying\_on\_Get\_Cause\_AP -0.032499045

Number\_of\_Throws\_Generic\_AP -0.019105567

Number\_of\_Throws\_Kitchen\_Sink\_AP -0.046551705

Code\_Ownership\_count -0.057614894

lines\_added 0.035640324

lines\_deleted 0.147976823

Pre\_release\_bugs -0.004908298

Number\_of\_Catch\_And\_Return\_Null\_AP

Number\_of\_Over\_Catches -0.036450023

Number\_of\_Catch\_And\_Return\_Null\_AP 1.000000000

Number\_of\_Destructive\_Wrapping\_AP 0.016700378

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.002736476

Number\_of\_Catch\_Generic\_AP 0.032458837

Number\_of\_Dummy\_Handler\_AP 0.007845404

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.076985776

Number\_of\_Log\_and\_Throw\_AP 0.057910943

Number\_of\_Mutliline\_log\_AP -0.027501511

Number\_of\_Nested\_Try\_AP 0.050846452

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.046970305

Number\_of\_Throws\_Generic\_AP -0.054309378

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.015314570

Code\_Ownership\_count -0.063941590

lines\_added -0.037337606

lines\_deleted -0.052820709

Pre\_release\_bugs 0.062505604

Number\_of\_Destructive\_Wrapping\_AP

Number\_of\_Over\_Catches -0.044473754

Number\_of\_Catch\_And\_Return\_Null\_AP 0.016700378

Number\_of\_Destructive\_Wrapping\_AP 1.000000000

Number\_of\_Catch\_and\_Do\_Nothing\_AP -0.021819214

Number\_of\_Catch\_Generic\_AP 0.069205058

Number\_of\_Dummy\_Handler\_AP 0.004818727

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.026655956

Number\_of\_Log\_and\_Throw\_AP 0.164039569

Number\_of\_Mutliline\_log\_AP -0.033555409

Number\_of\_Nested\_Try\_AP -0.011929319

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.154685992

Number\_of\_Throws\_Generic\_AP 0.068782460

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.043924736

Code\_Ownership\_count -0.038896127

lines\_added -0.001323880

lines\_deleted 0.001744755

Pre\_release\_bugs 0.034795796

Number\_of\_Catch\_and\_Do\_Nothing\_AP

Number\_of\_Over\_Catches 0.076575451

Number\_of\_Catch\_And\_Return\_Null\_AP 0.002736476

Number\_of\_Destructive\_Wrapping\_AP -0.021819214

Number\_of\_Catch\_and\_Do\_Nothing\_AP 1.000000000

Number\_of\_Catch\_Generic\_AP 0.191434566

Number\_of\_Dummy\_Handler\_AP 0.119251507

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.325450999

Number\_of\_Log\_and\_Throw\_AP 0.019520674

Number\_of\_Mutliline\_log\_AP 0.025316410

Number\_of\_Nested\_Try\_AP 0.245388656

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.061185969

Number\_of\_Throws\_Generic\_AP 0.016120667

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.090797422

Code\_Ownership\_count -0.090600940

lines\_added 0.054747919

lines\_deleted 0.083576040

Pre\_release\_bugs 0.047403767

Number\_of\_Catch\_Generic\_AP

Number\_of\_Over\_Catches 0.094740650

Number\_of\_Catch\_And\_Return\_Null\_AP 0.032458837

Number\_of\_Destructive\_Wrapping\_AP 0.069205058

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.191434566

Number\_of\_Catch\_Generic\_AP 1.000000000

Number\_of\_Dummy\_Handler\_AP 0.522538786

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.168607262

Number\_of\_Log\_and\_Throw\_AP 0.273382404

Number\_of\_Mutliline\_log\_AP 0.213639958

Number\_of\_Nested\_Try\_AP 0.224398910

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.085131468

Number\_of\_Throws\_Generic\_AP 0.345706666

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.089316985

Code\_Ownership\_count 0.003027019

lines\_added 0.324059838

lines\_deleted 0.263367302

Pre\_release\_bugs 0.051947708

Number\_of\_Dummy\_Handler\_AP

Number\_of\_Over\_Catches -0.097889881

Number\_of\_Catch\_And\_Return\_Null\_AP 0.007845404

Number\_of\_Destructive\_Wrapping\_AP 0.004818727

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.119251507

Number\_of\_Catch\_Generic\_AP 0.522538786

Number\_of\_Dummy\_Handler\_AP 1.000000000

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.178503922

Number\_of\_Log\_and\_Throw\_AP 0.242664924

Number\_of\_Mutliline\_log\_AP 0.289331797

Number\_of\_Nested\_Try\_AP 0.247373817

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.101488532

Number\_of\_Throws\_Generic\_AP 0.302733328

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.073365516

Code\_Ownership\_count 0.076079264

lines\_added 0.240793801

lines\_deleted 0.158351348

Pre\_release\_bugs -0.007442739

Number\_of\_Ignoring\_Interrupted\_Exception\_AP

Number\_of\_Over\_Catches -0.02469079

Number\_of\_Catch\_And\_Return\_Null\_AP 0.07698578

Number\_of\_Destructive\_Wrapping\_AP -0.02665596

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.32545100

Number\_of\_Catch\_Generic\_AP 0.16860726

Number\_of\_Dummy\_Handler\_AP 0.17850392

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 1.00000000

Number\_of\_Log\_and\_Throw\_AP -0.02969052

Number\_of\_Mutliline\_log\_AP -0.01862918

Number\_of\_Nested\_Try\_AP 0.18073489

Number\_of\_Relying\_on\_Get\_Cause\_AP -0.01947875

Number\_of\_Throws\_Generic\_AP 0.12600087

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.12921423

Code\_Ownership\_count -0.00245599

lines\_added 0.14225587

lines\_deleted 0.16229737

Pre\_release\_bugs -0.02968863

Number\_of\_Log\_and\_Throw\_AP

Number\_of\_Over\_Catches 0.086726704

Number\_of\_Catch\_And\_Return\_Null\_AP 0.057910943

Number\_of\_Destructive\_Wrapping\_AP 0.164039569

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.019520674

Number\_of\_Catch\_Generic\_AP 0.273382404

Number\_of\_Dummy\_Handler\_AP 0.242664924

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.029690523

Number\_of\_Log\_and\_Throw\_AP 1.000000000

Number\_of\_Mutliline\_log\_AP 0.141076494

Number\_of\_Nested\_Try\_AP 0.200134198

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.017854330

Number\_of\_Throws\_Generic\_AP 0.043824873

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.237816406

Code\_Ownership\_count 0.010861100

lines\_added 0.240172595

lines\_deleted 0.180528754

Pre\_release\_bugs 0.019173725

Number\_of\_Mutliline\_log\_AP

Number\_of\_Over\_Catches -0.03108159

Number\_of\_Catch\_And\_Return\_Null\_AP -0.02750151

Number\_of\_Destructive\_Wrapping\_AP -0.03355541

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.02531641

Number\_of\_Catch\_Generic\_AP 0.21363996

Number\_of\_Dummy\_Handler\_AP 0.28933180

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.01862918

Number\_of\_Log\_and\_Throw\_AP 0.14107649

Number\_of\_Mutliline\_log\_AP 1.00000000

Number\_of\_Nested\_Try\_AP 0.02037847

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.06764036

Number\_of\_Throws\_Generic\_AP 0.23145481

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.09113245

Code\_Ownership\_count 0.13136395

lines\_added 0.10674948

lines\_deleted 0.01500875

Pre\_release\_bugs 0.02140246

Number\_of\_Nested\_Try\_AP

Number\_of\_Over\_Catches -0.01035840

Number\_of\_Catch\_And\_Return\_Null\_AP 0.05084645

Number\_of\_Destructive\_Wrapping\_AP -0.01192932

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.24538866

Number\_of\_Catch\_Generic\_AP 0.22439891

Number\_of\_Dummy\_Handler\_AP 0.24737382

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.18073489

Number\_of\_Log\_and\_Throw\_AP 0.20013420

Number\_of\_Mutliline\_log\_AP 0.02037847

Number\_of\_Nested\_Try\_AP 1.00000000

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.18423757

Number\_of\_Throws\_Generic\_AP 0.07811962

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.09926880

Code\_Ownership\_count -0.04006776

lines\_added 0.21130198

lines\_deleted 0.17811360

Pre\_release\_bugs 0.12404536

Number\_of\_Relying\_on\_Get\_Cause\_AP

Number\_of\_Over\_Catches -0.0324990453

Number\_of\_Catch\_And\_Return\_Null\_AP 0.0469703051

Number\_of\_Destructive\_Wrapping\_AP 0.1546859925

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.0611859692

Number\_of\_Catch\_Generic\_AP 0.0851314675

Number\_of\_Dummy\_Handler\_AP 0.1014885322

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.0194787496

Number\_of\_Log\_and\_Throw\_AP 0.0178543302

Number\_of\_Mutliline\_log\_AP 0.0676403610

Number\_of\_Nested\_Try\_AP 0.1842375668

Number\_of\_Relying\_on\_Get\_Cause\_AP 1.0000000000

Number\_of\_Throws\_Generic\_AP -0.0052448046

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.1494365033

Code\_Ownership\_count -0.0753142288

lines\_added 0.0472426401

lines\_deleted 0.0325559286

Pre\_release\_bugs 0.1404822103

Number\_of\_Throws\_Generic\_AP

Number\_of\_Over\_Catches -0.019105567

Number\_of\_Catch\_And\_Return\_Null\_AP -0.054309378

Number\_of\_Destructive\_Wrapping\_AP 0.068782460

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.016120667

Number\_of\_Catch\_Generic\_AP 0.345706666

Number\_of\_Dummy\_Handler\_AP 0.302733328

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.126000874

Number\_of\_Log\_and\_Throw\_AP 0.043824873

Number\_of\_Mutliline\_log\_AP 0.231454810

Number\_of\_Nested\_Try\_AP 0.078119624

Number\_of\_Relying\_on\_Get\_Cause\_AP -0.005244805

Number\_of\_Throws\_Generic\_AP 1.000000000

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.080828369

Code\_Ownership\_count 0.073280209

lines\_added 0.214302309

lines\_deleted 0.167888962

Pre\_release\_bugs 0.061358049

Number\_of\_Throws\_Kitchen\_Sink\_AP

Number\_of\_Over\_Catches -0.046551705

Number\_of\_Catch\_And\_Return\_Null\_AP 0.015314570

Number\_of\_Destructive\_Wrapping\_AP 0.043924736

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.090797422

Number\_of\_Catch\_Generic\_AP 0.089316985

Number\_of\_Dummy\_Handler\_AP 0.073365516

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.129214228

Number\_of\_Log\_and\_Throw\_AP 0.237816406

Number\_of\_Mutliline\_log\_AP 0.091132453

Number\_of\_Nested\_Try\_AP 0.099268800

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.149436503

Number\_of\_Throws\_Generic\_AP 0.080828369

Number\_of\_Throws\_Kitchen\_Sink\_AP 1.000000000

Code\_Ownership\_count 0.042591629

lines\_added 0.110765465

lines\_deleted 0.066684287

Pre\_release\_bugs -0.015712617

Code\_Ownership\_count lines\_added

Number\_of\_Over\_Catches -0.057614894 0.03564032

Number\_of\_Catch\_And\_Return\_Null\_AP -0.063941590 -0.03733761

Number\_of\_Destructive\_Wrapping\_AP -0.038896127 -0.00132388

Number\_of\_Catch\_and\_Do\_Nothing\_AP -0.090600940 0.05474792

Number\_of\_Catch\_Generic\_AP 0.003027019 0.32405984

Number\_of\_Dummy\_Handler\_AP 0.076079264 0.24079380

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.002455990 0.14225587

Number\_of\_Log\_and\_Throw\_AP 0.010861100 0.24017259

Number\_of\_Mutliline\_log\_AP 0.131363951 0.10674948

Number\_of\_Nested\_Try\_AP -0.040067757 0.21130198

Number\_of\_Relying\_on\_Get\_Cause\_AP -0.075314229 0.04724264

Number\_of\_Throws\_Generic\_AP 0.073280209 0.21430231

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.042591629 0.11076547

Code\_Ownership\_count 1.000000000 0.13241839

lines\_added 0.132418387 1.00000000

lines\_deleted 0.036697586 0.64954558

Pre\_release\_bugs -0.092997775 0.18809164

lines\_deleted Pre\_release\_bugs

Number\_of\_Over\_Catches 0.147976823 -0.004908298

Number\_of\_Catch\_And\_Return\_Null\_AP -0.052820709 0.062505604

Number\_of\_Destructive\_Wrapping\_AP 0.001744755 0.034795796

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.083576040 0.047403767

Number\_of\_Catch\_Generic\_AP 0.263367302 0.051947708

Number\_of\_Dummy\_Handler\_AP 0.158351348 -0.007442739

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.162297374 -0.029688633

Number\_of\_Log\_and\_Throw\_AP 0.180528754 0.019173725

Number\_of\_Mutliline\_log\_AP 0.015008754 0.021402465

Number\_of\_Nested\_Try\_AP 0.178113596 0.124045356

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.032555929 0.140482210

Number\_of\_Throws\_Generic\_AP 0.167888962 0.061358049

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.066684287 -0.015712617

Code\_Ownership\_count 0.036697586 -0.092997775

lines\_added 0.649545579 0.188091640

lines\_deleted 1.000000000 0.166563722

Pre\_release\_bugs 0.166563722 1.000000000

AvgCyclomatic AvgCyclomaticModified

Number\_of\_Over\_Catches -0.150319304 -0.14658750

Number\_of\_Catch\_And\_Return\_Null\_AP 0.049237809 0.05192861

Number\_of\_Destructive\_Wrapping\_AP 0.066296886 0.05590368

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.013095822 0.01423683

Number\_of\_Catch\_Generic\_AP 0.155291143 0.15293664

Number\_of\_Dummy\_Handler\_AP 0.095789776 0.09812766

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.055361862 0.05976919

Number\_of\_Log\_and\_Throw\_AP 0.012902206 0.01805963

Number\_of\_Mutliline\_log\_AP 0.047550814 0.04202140

Number\_of\_Nested\_Try\_AP 0.074516806 0.08241402

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.059050958 0.05403983

Number\_of\_Throws\_Generic\_AP 0.062951471 0.05846895

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.018444535 0.02417576

Code\_Ownership\_count -0.079135701 -0.07603526

lines\_added 0.076188479 0.06353978

lines\_deleted 0.035679559 0.02937368

Pre\_release\_bugs 0.112653661 0.09710952

AvgCyclomaticStrict AvgEssential

Number\_of\_Over\_Catches -0.135679687 -0.053305777

Number\_of\_Catch\_And\_Return\_Null\_AP 0.040020724 0.054912707

Number\_of\_Destructive\_Wrapping\_AP 0.040666257 -0.057548445

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.029364819 -0.026096701

Number\_of\_Catch\_Generic\_AP 0.161685749 -0.079010600

Number\_of\_Dummy\_Handler\_AP 0.108854173 -0.032867014

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.066926307 -0.031949550

Number\_of\_Log\_and\_Throw\_AP 0.001381828 -0.064099874

Number\_of\_Mutliline\_log\_AP 0.048732035 0.014754152

Number\_of\_Nested\_Try\_AP 0.074686316 0.037756480

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.040132040 0.010969758

Number\_of\_Throws\_Generic\_AP 0.030742327 -0.055429438

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.008287956 -0.022579874

Code\_Ownership\_count -0.063653468 -0.068082325

lines\_added 0.091364199 0.026403651

lines\_deleted 0.037892305 -0.055161714

Pre\_release\_bugs 0.104597792 0.119941583

AvgLine AvgLineBlank AvgLineCode

Number\_of\_Over\_Catches -0.05372008 -0.079468043 -0.074466927

Number\_of\_Catch\_And\_Return\_Null\_AP 0.07705941 0.035367905 0.057150540

Number\_of\_Destructive\_Wrapping\_AP 0.05679315 0.026365504 0.060835953

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.10806337 0.038904411 0.059906885

Number\_of\_Catch\_Generic\_AP 0.26447331 0.044567588 0.279798243

Number\_of\_Dummy\_Handler\_AP 0.19098928 0.071414714 0.232242142

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.08276870 0.051251263 0.075487538

Number\_of\_Log\_and\_Throw\_AP 0.06556542 0.007950417 0.072477282

Number\_of\_Mutliline\_log\_AP 0.12636809 0.057866621 0.128812092

Number\_of\_Nested\_Try\_AP 0.20312718 0.055159825 0.193619546

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.09806975 0.050952300 0.090466928

Number\_of\_Throws\_Generic\_AP 0.12884976 0.030035588 0.154055984

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.06904760 0.046250554 0.054875066

Code\_Ownership\_count -0.01741188 -0.017882165 -0.041192516

lines\_added 0.15383784 0.016764115 0.157081988

lines\_deleted 0.07953007 -0.023739489 0.076204981

Pre\_release\_bugs 0.12578741 0.031141604 0.137033670

AvgLineComment CountDeclClass

Number\_of\_Over\_Catches 0.050227219 -0.059517627

Number\_of\_Catch\_And\_Return\_Null\_AP 0.051600323 0.025841632

Number\_of\_Destructive\_Wrapping\_AP 0.031825223 0.044969458

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.207715409 0.124344450

Number\_of\_Catch\_Generic\_AP 0.081607115 0.277262017

Number\_of\_Dummy\_Handler\_AP -0.007786238 0.346971621

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.050552490 0.154551888

Number\_of\_Log\_and\_Throw\_AP 0.039772449 0.136573243

Number\_of\_Mutliline\_log\_AP 0.065107310 0.117141911

Number\_of\_Nested\_Try\_AP 0.164006898 0.187811367

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.110012932 0.009763912

Number\_of\_Throws\_Generic\_AP -0.057009185 0.308145216

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.012126302 0.107795656

Code\_Ownership\_count 0.043795315 0.024233404

lines\_added 0.069030501 0.184710713

lines\_deleted 0.053372928 0.073113989

Pre\_release\_bugs -0.019569481 0.039699444

CountDeclClassMethod

Number\_of\_Over\_Catches -0.082605627

Number\_of\_Catch\_And\_Return\_Null\_AP 0.011539841

Number\_of\_Destructive\_Wrapping\_AP 0.035935402

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.168300845

Number\_of\_Catch\_Generic\_AP 0.026494002

Number\_of\_Dummy\_Handler\_AP 0.009720628

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -0.010823303

Number\_of\_Log\_and\_Throw\_AP 0.054294011

Number\_of\_Mutliline\_log\_AP 0.027960424

Number\_of\_Nested\_Try\_AP 0.160324447

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.009553481

Number\_of\_Throws\_Generic\_AP 0.024133817

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.014284986

Code\_Ownership\_count 0.048641140

lines\_added 0.129287650

lines\_deleted 0.045383429

Pre\_release\_bugs 0.050276023

CountDeclClassVariable

Number\_of\_Over\_Catches -0.08930244

Number\_of\_Catch\_And\_Return\_Null\_AP 0.07474495

Number\_of\_Destructive\_Wrapping\_AP -0.03433355

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.10836225

Number\_of\_Catch\_Generic\_AP 0.14253976

Number\_of\_Dummy\_Handler\_AP 0.18184846

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.05783043

Number\_of\_Log\_and\_Throw\_AP 0.16194041

Number\_of\_Mutliline\_log\_AP 0.03914013

Number\_of\_Nested\_Try\_AP 0.16296912

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.03059485

Number\_of\_Throws\_Generic\_AP 0.10093982

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.07878443

Code\_Ownership\_count 0.03486385

lines\_added 0.20648342

lines\_deleted 0.10101572

Pre\_release\_bugs 0.04378889

CountDeclExecutableUnit

Number\_of\_Over\_Catches 0.0541366109

Number\_of\_Catch\_And\_Return\_Null\_AP 0.0318709398

Number\_of\_Destructive\_Wrapping\_AP 0.0548324633

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.2076950658

Number\_of\_Catch\_Generic\_AP 0.2742822772

Number\_of\_Dummy\_Handler\_AP 0.1826515825

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.1162344235

Number\_of\_Log\_and\_Throw\_AP 0.1624480194

Number\_of\_Mutliline\_log\_AP 0.0844509831

Number\_of\_Nested\_Try\_AP 0.2549724639

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.0005018251

Number\_of\_Throws\_Generic\_AP 0.1910799662

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.1017784401

Code\_Ownership\_count 0.0748306533

lines\_added 0.3313268974

lines\_deleted 0.2682136550

Pre\_release\_bugs 0.0741156761

CountDeclFunction

Number\_of\_Over\_Catches 0.050280667

Number\_of\_Catch\_And\_Return\_Null\_AP 0.026135119

Number\_of\_Destructive\_Wrapping\_AP 0.060017400

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.207354214

Number\_of\_Catch\_Generic\_AP 0.280542934

Number\_of\_Dummy\_Handler\_AP 0.197343344

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.115412127

Number\_of\_Log\_and\_Throw\_AP 0.159996878

Number\_of\_Mutliline\_log\_AP 0.074676769

Number\_of\_Nested\_Try\_AP 0.256027629

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.003716171

Number\_of\_Throws\_Generic\_AP 0.205786674

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.102894586

Code\_Ownership\_count 0.084617388

lines\_added 0.327446869

lines\_deleted 0.267901628

Pre\_release\_bugs 0.070618240

CountDeclInstanceMethod

Number\_of\_Over\_Catches 0.06389793

Number\_of\_Catch\_And\_Return\_Null\_AP 0.01331245

Number\_of\_Destructive\_Wrapping\_AP 0.07433859

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.13265281

Number\_of\_Catch\_Generic\_AP 0.27442341

Number\_of\_Dummy\_Handler\_AP 0.20160374

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.11213561

Number\_of\_Log\_and\_Throw\_AP 0.15981283

Number\_of\_Mutliline\_log\_AP 0.07936696

Number\_of\_Nested\_Try\_AP 0.21723823

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.01745803

Number\_of\_Throws\_Generic\_AP 0.18763407

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.11564249

Code\_Ownership\_count 0.07114455

lines\_added 0.29605521

lines\_deleted 0.24262928

Pre\_release\_bugs 0.05837151

CountDeclInstanceVariable

Number\_of\_Over\_Catches 0.005938634

Number\_of\_Catch\_And\_Return\_Null\_AP -0.023059202

Number\_of\_Destructive\_Wrapping\_AP 0.037634680

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.137933137

Number\_of\_Catch\_Generic\_AP 0.312408040

Number\_of\_Dummy\_Handler\_AP 0.317727498

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.130245027

Number\_of\_Log\_and\_Throw\_AP 0.138587387

Number\_of\_Mutliline\_log\_AP 0.129362041

Number\_of\_Nested\_Try\_AP 0.220443949

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.044816003

Number\_of\_Throws\_Generic\_AP 0.216108937

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.130572692

Code\_Ownership\_count 0.066271201

lines\_added 0.235265297

lines\_deleted 0.165189778

Pre\_release\_bugs 0.091577388

CountDeclMethod CountDeclMethodDefault

Number\_of\_Over\_Catches 0.044835477 -0.073321746

Number\_of\_Catch\_And\_Return\_Null\_AP 0.024355076 0.017257969

Number\_of\_Destructive\_Wrapping\_AP 0.059906846 0.085380594

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.209676414 0.101008848

Number\_of\_Catch\_Generic\_AP 0.261840205 0.157824200

Number\_of\_Dummy\_Handler\_AP 0.182454878 0.226040321

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.118244327 0.080326273

Number\_of\_Log\_and\_Throw\_AP 0.148641510 0.060831748

Number\_of\_Mutliline\_log\_AP 0.088155508 0.043149386

Number\_of\_Nested\_Try\_AP 0.241241230 0.192275967

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.003398182 0.113024225

Number\_of\_Throws\_Generic\_AP 0.188071785 0.226688381

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.098879905 0.060572994

Code\_Ownership\_count 0.078125990 -0.026984725

lines\_added 0.298914832 0.143273589

lines\_deleted 0.238577494 0.097057161

Pre\_release\_bugs 0.072328770 0.039920427

CountDeclMethodPrivate

Number\_of\_Over\_Catches -0.09970535

Number\_of\_Catch\_And\_Return\_Null\_AP 0.05799395

Number\_of\_Destructive\_Wrapping\_AP 0.07316965

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.21236304

Number\_of\_Catch\_Generic\_AP 0.25675608

Number\_of\_Dummy\_Handler\_AP 0.24902042

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.11280032

Number\_of\_Log\_and\_Throw\_AP 0.13054584

Number\_of\_Mutliline\_log\_AP 0.10411107

Number\_of\_Nested\_Try\_AP 0.30085500

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.04124152

Number\_of\_Throws\_Generic\_AP 0.22757446

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.06746941

Code\_Ownership\_count 0.02633417

lines\_added 0.22559332

lines\_deleted 0.13660400

Pre\_release\_bugs 0.10675595

CountDeclMethodProtected

Number\_of\_Over\_Catches 0.072737937

Number\_of\_Catch\_And\_Return\_Null\_AP 0.016046991

Number\_of\_Destructive\_Wrapping\_AP 0.033740439

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.004134259

Number\_of\_Catch\_Generic\_AP 0.274407575

Number\_of\_Dummy\_Handler\_AP 0.269514496

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.077703137

Number\_of\_Log\_and\_Throw\_AP 0.246799177

Number\_of\_Mutliline\_log\_AP 0.115459897

Number\_of\_Nested\_Try\_AP 0.168780563

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.001253757

Number\_of\_Throws\_Generic\_AP 0.192985590

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.099968164

Code\_Ownership\_count 0.115921854

lines\_added 0.199337904

lines\_deleted 0.161110205

Pre\_release\_bugs 0.085457355

CountDeclMethodPublic CountLine

Number\_of\_Over\_Catches 0.01710108 0.01437184

Number\_of\_Catch\_And\_Return\_Null\_AP 0.02251247 0.04022130

Number\_of\_Destructive\_Wrapping\_AP 0.06518936 0.06674274

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.16090613 0.23308356

Number\_of\_Catch\_Generic\_AP 0.18958114 0.33771552

Number\_of\_Dummy\_Handler\_AP 0.12042533 0.24169426

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.10768413 0.12611232

Number\_of\_Log\_and\_Throw\_AP 0.11322976 0.17458041

Number\_of\_Mutliline\_log\_AP 0.07203600 0.12832161

Number\_of\_Nested\_Try\_AP 0.18544026 0.30532591

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.01417480 0.03580452

Number\_of\_Throws\_Generic\_AP 0.15023323 0.21582355

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.11621560 0.12429361

Code\_Ownership\_count 0.06223902 0.05831365

lines\_added 0.24823364 0.36127918

lines\_deleted 0.16141112 0.26692642

Pre\_release\_bugs 0.02899082 0.11485455

CountLineBlank CountLineCode

Number\_of\_Over\_Catches 0.002360383 0.007721287

Number\_of\_Catch\_And\_Return\_Null\_AP 0.036600472 0.044627668

Number\_of\_Destructive\_Wrapping\_AP 0.057044379 0.068153504

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.238283629 0.206212280

Number\_of\_Catch\_Generic\_AP 0.299290338 0.353043496

Number\_of\_Dummy\_Handler\_AP 0.240797136 0.254106088

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.126537073 0.123002349

Number\_of\_Log\_and\_Throw\_AP 0.167853415 0.179904693

Number\_of\_Mutliline\_log\_AP 0.116443830 0.133685369

Number\_of\_Nested\_Try\_AP 0.274212222 0.304651951

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.010817824 0.038415645

Number\_of\_Throws\_Generic\_AP 0.208481101 0.228030205

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.111954516 0.117523382

Code\_Ownership\_count 0.074010886 0.044993188

lines\_added 0.321081781 0.376894989

lines\_deleted 0.234993048 0.274915052

Pre\_release\_bugs 0.095289375 0.129844514

CountLineCodeDecl CountLineCodeExe

Number\_of\_Over\_Catches 0.02763787 -0.01061017

Number\_of\_Catch\_And\_Return\_Null\_AP 0.02978572 0.05500901

Number\_of\_Destructive\_Wrapping\_AP 0.06166482 0.07119985

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.19142919 0.20956928

Number\_of\_Catch\_Generic\_AP 0.33998583 0.35644102

Number\_of\_Dummy\_Handler\_AP 0.24030830 0.25943704

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.11152909 0.11989930

Number\_of\_Log\_and\_Throw\_AP 0.20901087 0.17222369

Number\_of\_Mutliline\_log\_AP 0.11549159 0.14268088

Number\_of\_Nested\_Try\_AP 0.29808650 0.30640615

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.03077799 0.04799313

Number\_of\_Throws\_Generic\_AP 0.24583066 0.21201172

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.14122188 0.10977403

Code\_Ownership\_count 0.04909888 0.04127233

lines\_added 0.39069231 0.37110517

lines\_deleted 0.29741030 0.26150189

Pre\_release\_bugs 0.12700301 0.13905645

CountLineComment CountSemicolon

Number\_of\_Over\_Catches 0.02935443 0.01813539

Number\_of\_Catch\_And\_Return\_Null\_AP 0.02161674 0.03655275

Number\_of\_Destructive\_Wrapping\_AP 0.07583233 0.05780179

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.29132831 0.20482203

Number\_of\_Catch\_Generic\_AP 0.22390732 0.35507234

Number\_of\_Dummy\_Handler\_AP 0.14599665 0.26341727

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.10429522 0.11912242

Number\_of\_Log\_and\_Throw\_AP 0.13571737 0.18705031

Number\_of\_Mutliline\_log\_AP 0.09425480 0.13478942

Number\_of\_Nested\_Try\_AP 0.28421975 0.30691143

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.06250491 0.04215613

Number\_of\_Throws\_Generic\_AP 0.12679339 0.22857631

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.10307579 0.12127421

Code\_Ownership\_count 0.08722020 0.04982632

lines\_added 0.23836471 0.38378948

lines\_deleted 0.18561553 0.28064957

Pre\_release\_bugs 0.03992995 0.14298965

CountStmt CountStmtDecl

Number\_of\_Over\_Catches 0.006599423 0.01903187

Number\_of\_Catch\_And\_Return\_Null\_AP 0.041481057 0.03831858

Number\_of\_Destructive\_Wrapping\_AP 0.058997495 0.05973423

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.210607709 0.20030920

Number\_of\_Catch\_Generic\_AP 0.352418293 0.35266202

Number\_of\_Dummy\_Handler\_AP 0.262061466 0.26347209

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.121695970 0.11731287

Number\_of\_Log\_and\_Throw\_AP 0.177177925 0.19858277

Number\_of\_Mutliline\_log\_AP 0.129748433 0.11580357

Number\_of\_Nested\_Try\_AP 0.306685483 0.29981031

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.037483094 0.02951417

Number\_of\_Throws\_Generic\_AP 0.225694914 0.24307509

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.114381045 0.13099104

Code\_Ownership\_count 0.044195479 0.04502798

lines\_added 0.375740230 0.38753223

lines\_deleted 0.274245277 0.29081360

Pre\_release\_bugs 0.135414563 0.12488289

CountStmtExe MaxCyclomatic

Number\_of\_Over\_Catches -0.003316813 -0.06253950

Number\_of\_Catch\_And\_Return\_Null\_AP 0.047551467 0.04403516

Number\_of\_Destructive\_Wrapping\_AP 0.057948633 0.06083864

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.218337588 0.15296425

Number\_of\_Catch\_Generic\_AP 0.342303855 0.27843813

Number\_of\_Dummy\_Handler\_AP 0.255473127 0.19151681

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.121908495 0.09888359

Number\_of\_Log\_and\_Throw\_AP 0.158963311 0.12079254

Number\_of\_Mutliline\_log\_AP 0.138635571 0.10272171

Number\_of\_Nested\_Try\_AP 0.302439910 0.19838588

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.037500459 0.03637090

Number\_of\_Throws\_Generic\_AP 0.204335597 0.13807738

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.100136280 0.07777011

Code\_Ownership\_count 0.042828496 -0.02284447

lines\_added 0.353690024 0.32599781

lines\_deleted 0.250839119 0.20331529

Pre\_release\_bugs 0.140183031 0.12383995

MaxCyclomaticModified

Number\_of\_Over\_Catches -0.06104000

Number\_of\_Catch\_And\_Return\_Null\_AP 0.04754228

Number\_of\_Destructive\_Wrapping\_AP 0.05282356

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.16862523

Number\_of\_Catch\_Generic\_AP 0.28998676

Number\_of\_Dummy\_Handler\_AP 0.20726195

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.10489072

Number\_of\_Log\_and\_Throw\_AP 0.13044652

Number\_of\_Mutliline\_log\_AP 0.10703860

Number\_of\_Nested\_Try\_AP 0.20908643

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.03935809

Number\_of\_Throws\_Generic\_AP 0.13609171

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.08160149

Code\_Ownership\_count -0.02093836

lines\_added 0.31407876

lines\_deleted 0.19679346

Pre\_release\_bugs 0.09321766

MaxCyclomaticStrict MaxEssential

Number\_of\_Over\_Catches -0.03755257 -0.07024136

Number\_of\_Catch\_And\_Return\_Null\_AP 0.05206000 0.08934337

Number\_of\_Destructive\_Wrapping\_AP 0.04721254 0.05136484

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.16236419 0.12795836

Number\_of\_Catch\_Generic\_AP 0.26079307 0.15160210

Number\_of\_Dummy\_Handler\_AP 0.17232103 0.10990809

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.09657573 0.07923005

Number\_of\_Log\_and\_Throw\_AP 0.12217253 0.04159112

Number\_of\_Mutliline\_log\_AP 0.10395149 0.07679016

Number\_of\_Nested\_Try\_AP 0.20144645 0.17477850

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.03686859 0.06144502

Number\_of\_Throws\_Generic\_AP 0.12511802 0.13140947

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.07818008 0.04065989

Code\_Ownership\_count -0.02073015 -0.06177682

lines\_added 0.32965614 0.18514248

lines\_deleted 0.20481278 0.10622827

Pre\_release\_bugs 0.13971082 0.15255061

MaxNesting RatioCommentToCode

Number\_of\_Over\_Catches -0.06314442 0.02915989

Number\_of\_Catch\_And\_Return\_Null\_AP 0.04453580 -0.04674069

Number\_of\_Destructive\_Wrapping\_AP 0.02652575 -0.02856280

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.11783485 0.04016867

Number\_of\_Catch\_Generic\_AP 0.29425760 -0.24669172

Number\_of\_Dummy\_Handler\_AP 0.21492269 -0.19681529

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.08788750 -0.07292738

Number\_of\_Log\_and\_Throw\_AP 0.16256625 -0.08395031

Number\_of\_Mutliline\_log\_AP 0.10897197 -0.09665551

Number\_of\_Nested\_Try\_AP 0.24176934 -0.08531454

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.01667680 0.02240711

Number\_of\_Throws\_Generic\_AP 0.07440297 -0.19362226

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.06366282 -0.05061221

Code\_Ownership\_count -0.03029612 0.03004886

lines\_added 0.27259035 -0.26422570

lines\_deleted 0.18090220 -0.18272833

Pre\_release\_bugs 0.03132455 -0.15259759

SumCyclomatic SumCyclomaticModified

Number\_of\_Over\_Catches -0.007574536 -0.004908498

Number\_of\_Catch\_And\_Return\_Null\_AP 0.057695385 0.059746753

Number\_of\_Destructive\_Wrapping\_AP 0.068852928 0.067394600

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.213416870 0.215768130

Number\_of\_Catch\_Generic\_AP 0.333946020 0.333769386

Number\_of\_Dummy\_Handler\_AP 0.234323316 0.237444746

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.121375051 0.122316535

Number\_of\_Log\_and\_Throw\_AP 0.165650226 0.167733198

Number\_of\_Mutliline\_log\_AP 0.120406741 0.119769262

Number\_of\_Nested\_Try\_AP 0.285091598 0.286930421

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.023678181 0.023777865

Number\_of\_Throws\_Generic\_AP 0.208895765 0.208291595

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.106642157 0.103533991

Code\_Ownership\_count 0.037421806 0.039519180

lines\_added 0.359551132 0.355743866

lines\_deleted 0.258900471 0.258984381

Pre\_release\_bugs 0.127077955 0.117050348

SumCyclomaticStrict SumEssential

Number\_of\_Over\_Catches -0.008814021 0.02366624

Number\_of\_Catch\_And\_Return\_Null\_AP 0.058411896 0.06778078

Number\_of\_Destructive\_Wrapping\_AP 0.066965775 0.05552898

Number\_of\_Catch\_and\_Do\_Nothing\_AP 0.213114747 0.20719241

Number\_of\_Catch\_Generic\_AP 0.326453022 0.27447350

Number\_of\_Dummy\_Handler\_AP 0.229674416 0.18440863

Number\_of\_Ignoring\_Interrupted\_Exception\_AP 0.124443557 0.10681746

Number\_of\_Log\_and\_Throw\_AP 0.160718579 0.14310936

Number\_of\_Mutliline\_log\_AP 0.122954495 0.10619878

Number\_of\_Nested\_Try\_AP 0.284332838 0.26516900

Number\_of\_Relying\_on\_Get\_Cause\_AP 0.021547329 0.01529451

Number\_of\_Throws\_Generic\_AP 0.203471631 0.18925441

Number\_of\_Throws\_Kitchen\_Sink\_AP 0.102310228 0.09316870

Code\_Ownership\_count 0.034246912 0.04761057

lines\_added 0.359499802 0.32949991

lines\_deleted 0.256176613 0.24560048

Pre\_release\_bugs 0.129796962 0.11866546

[ reached getOption("max.print") -- omitted 40 rows ]

> highCorr <- findCorrelation(correlationMatrix, cutoff = 0.75)

> highCorr # these are column no.s

[1] 42 45 40 47 44 38 54 56 55 46 41 39 57 30 29 33 50 48 49 31 22 24 20 18

> low\_cor\_names=names(independant[, -highCorr])

> low\_corr\_data=independant[(names(independant) %in% low\_cor\_names)]

> names(low\_corr\_data)

[1] "Number\_of\_Over\_Catches"

[2] "Number\_of\_Catch\_And\_Return\_Null\_AP"

[3] "Number\_of\_Destructive\_Wrapping\_AP"

[4] "Number\_of\_Catch\_and\_Do\_Nothing\_AP"

[5] "Number\_of\_Catch\_Generic\_AP"

[6] "Number\_of\_Dummy\_Handler\_AP"

[7] "Number\_of\_Ignoring\_Interrupted\_Exception\_AP"

[8] "Number\_of\_Log\_and\_Throw\_AP"

[9] "Number\_of\_Mutliline\_log\_AP"

[10] "Number\_of\_Nested\_Try\_AP"

[11] "Number\_of\_Relying\_on\_Get\_Cause\_AP"

[12] "Number\_of\_Throws\_Generic\_AP"

[13] "Number\_of\_Throws\_Kitchen\_Sink\_AP"

[14] "Code\_Ownership\_count"

[15] "lines\_added"

[16] "lines\_deleted"

[17] "Pre\_release\_bugs"

[18] "AvgCyclomaticModified"

[19] "AvgEssential"

[20] "AvgLineBlank"

[21] "AvgLineComment"

[22] "CountDeclClass"

[23] "CountDeclClassMethod"

[24] "CountDeclClassVariable"

[25] "CountDeclInstanceVariable"

[26] "CountDeclMethodDefault"

[27] "CountDeclMethodPrivate"

[28] "CountDeclMethodProtected"

[29] "CountDeclMethodPublic"

[30] "CountLineComment"

[31] "MaxEssential"

[32] "MaxNesting"

[33] "RatioCommentToCode"

> #metrics that have high correlation so these have to be removed

> dataforredun=low\_corr\_data

#########start redun

> #redun on everything ~ means everything nk=0 means linear combination of data

> #and default r2=0.9

>

> redun\_obj = redun (~. ,data = dataforredun ,nk =0)

> redun\_obj

Redundancy Analysis

redun(formula = ~., data = dataforredun, nk = 0)

n: 480 p: 33 nk: 0

Number of NAs: 0

Transformation of target variables forced to be linear

R-squared cutoff: 0.9 Type: ordinary

R^2 with which each variable can be predicted from all other variables:

Number\_of\_Over\_Catches

0.059

Number\_of\_Catch\_And\_Return\_Null\_AP

0.087

Number\_of\_Destructive\_Wrapping\_AP

0.123

Number\_of\_Catch\_and\_Do\_Nothing\_AP

0.434

Number\_of\_Catch\_Generic\_AP

0.724

Number\_of\_Dummy\_Handler\_AP

0.668

Number\_of\_Ignoring\_Interrupted\_Exception\_AP

0.182

Number\_of\_Log\_and\_Throw\_AP

0.162

Number\_of\_Mutliline\_log\_AP

0.259

Number\_of\_Nested\_Try\_AP

0.502

Number\_of\_Relying\_on\_Get\_Cause\_AP

0.193

Number\_of\_Throws\_Generic\_AP

0.276

Number\_of\_Throws\_Kitchen\_Sink\_AP

0.065

Code\_Ownership\_count

0.097

lines\_added

0.575

lines\_deleted

0.524

Pre\_release\_bugs

0.123

AvgCyclomaticModified

0.564

AvgEssential

0.587

AvgLineBlank

0.646

AvgLineComment

0.666

CountDeclClass

0.559

CountDeclClassMethod

0.608

CountDeclClassVariable

0.393

CountDeclInstanceVariable

0.783

CountDeclMethodDefault

0.415

CountDeclMethodPrivate

0.708

CountDeclMethodProtected

0.321

CountDeclMethodPublic

0.743

CountLineComment

0.833

MaxEssential

0.428

MaxNesting

0.543

RatioCommentToCode

0.425

No redundant variables

> #we have to delete the redundant objects

> after\_redun= dataforredun[,!(names(dataforredun) %in% redun\_obj $Out)]

>

> names(after\_redun)

[1] "Number\_of\_Over\_Catches"

[2] "Number\_of\_Catch\_And\_Return\_Null\_AP"

[3] "Number\_of\_Destructive\_Wrapping\_AP"

[4] "Number\_of\_Catch\_and\_Do\_Nothing\_AP"

[5] "Number\_of\_Catch\_Generic\_AP"

[6] "Number\_of\_Dummy\_Handler\_AP"

[7] "Number\_of\_Ignoring\_Interrupted\_Exception\_AP"

[8] "Number\_of\_Log\_and\_Throw\_AP"

[9] "Number\_of\_Mutliline\_log\_AP"

[10] "Number\_of\_Nested\_Try\_AP"

[11] "Number\_of\_Relying\_on\_Get\_Cause\_AP"

[12] "Number\_of\_Throws\_Generic\_AP"

[13] "Number\_of\_Throws\_Kitchen\_Sink\_AP"

[14] "Code\_Ownership\_count"

[15] "lines\_added"

[16] "lines\_deleted"

[17] "Pre\_release\_bugs"

[18] "AvgCyclomaticModified"

[19] "AvgEssential"

[20] "AvgLineBlank"

[21] "AvgLineComment"

[22] "CountDeclClass"

[23] "CountDeclClassMethod"

[24] "CountDeclClassVariable"

[25] "CountDeclInstanceVariable"

[26] "CountDeclMethodDefault"

[27] "CountDeclMethodPrivate"

[28] "CountDeclMethodProtected"

[29] "CountDeclMethodPublic"

[30] "CountLineComment"

[31] "MaxEssential"

[32] "MaxNesting"

[33] "RatioCommentToCode"

> ############model

> data<-na.omit(data)

> summary(data$Post\_release\_bugs)

Min. 1st Qu. Median Mean 3rd Qu. Max.

0.000 0.000 0.000 1.204 2.000 23.000

> #to change them into boolean

> #string concatenation of all rows

> paste(names(after\_redun),collapse="+")

[1] "Number\_of\_Over\_Catches+Number\_of\_Catch\_And\_Return\_Null\_AP+Number\_of\_Destructive\_Wrapping\_AP+Number\_of\_Catch\_and\_Do\_Nothing\_AP+Number\_of\_Catch\_Generic\_AP+Number\_of\_Dummy\_Handler\_AP+Number\_of\_Ignoring\_Interrupted\_Exception\_AP+Number\_of\_Log\_and\_Throw\_AP+Number\_of\_Mutliline\_log\_AP+Number\_of\_Nested\_Try\_AP+Number\_of\_Relying\_on\_Get\_Cause\_AP+Number\_of\_Throws\_Generic\_AP+Number\_of\_Throws\_Kitchen\_Sink\_AP+Code\_Ownership\_count+lines\_added+lines\_deleted+Pre\_release\_bugs+AvgCyclomaticModified+AvgEssential+AvgLineBlank+AvgLineComment+CountDeclClass+CountDeclClassMethod+CountDeclClassVariable+CountDeclInstanceVariable+CountDeclMethodDefault+CountDeclMethodPrivate+CountDeclMethodProtected+CountDeclMethodPublic+CountLineComment+MaxEssential+MaxNesting+RatioCommentToCode"

> #to make into formula

> paste("post-release-bugs>0~",paste(names(after\_redun),collapse="+"))

[1] "post-release-bugs>0~ Number\_of\_Over\_Catches+Number\_of\_Catch\_And\_Return\_Null\_AP+Number\_of\_Destructive\_Wrapping\_AP+Number\_of\_Catch\_and\_Do\_Nothing\_AP+Number\_of\_Catch\_Generic\_AP+Number\_of\_Dummy\_Handler\_AP+Number\_of\_Ignoring\_Interrupted\_Exception\_AP+Number\_of\_Log\_and\_Throw\_AP+Number\_of\_Mutliline\_log\_AP+Number\_of\_Nested\_Try\_AP+Number\_of\_Relying\_on\_Get\_Cause\_AP+Number\_of\_Throws\_Generic\_AP+Number\_of\_Throws\_Kitchen\_Sink\_AP+Code\_Ownership\_count+lines\_added+lines\_deleted+Pre\_release\_bugs+AvgCyclomaticModified+AvgEssential+AvgLineBlank+AvgLineComment+CountDeclClass+CountDeclClassMethod+CountDeclClassVariable+CountDeclInstanceVariable+CountDeclMethodDefault+CountDeclMethodPrivate+CountDeclMethodProtected+CountDeclMethodPublic+CountLineComment+MaxEssential+MaxNesting+RatioCommentToCode"

> #formula to make model

> #form=as.formula(paste("'post-release-bugs'>0~",paste("pre-release-bugs","numberOfMajorBugsFoundUntil:","numberOfCriticalBugsFoundUntil:","numberOfHighPriorityBugsFoundUntil:","numberOfFixesUntil:","numberOfRefactoringsUntil:","avgLinesAddedUntil:","avgLinesRemovedUntil:","ageWithRespectTo:","weightedAgeWithRespectTo:",fanIn,fanOut,noc,numberOfAttributesInherited,numberOfMethodsInherited,numberOfPrivateAttributes,numberOfPrivateMethods,numberOfPublicAttributes,numberOfPublicMethods,CvsExpEntropy,collapse="+")))

> form=as.formula(paste("Post\_release\_bugs>0~",paste(names(after\_redun),collapse="+")))

> form

Post\_release\_bugs > 0 ~ Number\_of\_Over\_Catches + Number\_of\_Catch\_And\_Return\_Null\_AP +

Number\_of\_Destructive\_Wrapping\_AP + Number\_of\_Catch\_and\_Do\_Nothing\_AP +

Number\_of\_Catch\_Generic\_AP + Number\_of\_Dummy\_Handler\_AP +

Number\_of\_Ignoring\_Interrupted\_Exception\_AP + Number\_of\_Log\_and\_Throw\_AP +

Number\_of\_Mutliline\_log\_AP + Number\_of\_Nested\_Try\_AP + Number\_of\_Relying\_on\_Get\_Cause\_AP +

Number\_of\_Throws\_Generic\_AP + Number\_of\_Throws\_Kitchen\_Sink\_AP +

Code\_Ownership\_count + lines\_added + lines\_deleted + Pre\_release\_bugs +

AvgCyclomaticModified + AvgEssential + AvgLineBlank + AvgLineComment +

CountDeclClass + CountDeclClassMethod + CountDeclClassVariable +

CountDeclInstanceVariable + CountDeclMethodDefault + CountDeclMethodPrivate +

CountDeclMethodProtected + CountDeclMethodPublic + CountLineComment +

MaxEssential + MaxNesting + RatioCommentToCode

> del=c("file\_name")

> data = data[,!(names(data) %in% del)]

> #removing comp as it has charecters

> model=glm(formula=form, data=log10(data+1), family = binomial(link = "logit"))

Warning message:

glm.fit: fitted probabilities numerically 0 or 1 occurred

> #model1=glmnet(formula=form, data=log10(data+1), family = binomial(link = "logit"))

>

> model

Call: glm(formula = form, family = binomial(link = "logit"), data = log10(data +

1))

Coefficients:

(Intercept)

-2.12624

Number\_of\_Over\_Catches

-8.15682

Number\_of\_Catch\_And\_Return\_Null\_AP

6.87264

Number\_of\_Destructive\_Wrapping\_AP

-3.36523

Number\_of\_Catch\_and\_Do\_Nothing\_AP

-5.77311

Number\_of\_Catch\_Generic\_AP

0.07054

Number\_of\_Dummy\_Handler\_AP

-1.46304

Number\_of\_Ignoring\_Interrupted\_Exception\_AP

-27.01777

Number\_of\_Log\_and\_Throw\_AP

7.98387

Number\_of\_Mutliline\_log\_AP

17.03575

Number\_of\_Nested\_Try\_AP

9.56468

Number\_of\_Relying\_on\_Get\_Cause\_AP

10.30622

Number\_of\_Throws\_Generic\_AP

6.64523

Number\_of\_Throws\_Kitchen\_Sink\_AP

3.90525

Code\_Ownership\_count

-1.20819

lines\_added

22.42024

lines\_deleted

40.08974

Pre\_release\_bugs

-38.50463

AvgCyclomaticModified

-10.76700

AvgEssential

4.74819

AvgLineBlank

-0.88254

AvgLineComment

1.06474

CountDeclClass

-1.42437

CountDeclClassMethod

-3.27758

CountDeclClassVariable

1.44121

CountDeclInstanceVariable

-0.27321

CountDeclMethodDefault

-2.94954

CountDeclMethodPrivate

-0.96376

CountDeclMethodProtected

-1.14101

CountDeclMethodPublic

0.26140

CountLineComment

1.17707

MaxEssential

-0.34916

MaxNesting

5.38929

RatioCommentToCode

-10.85901

Degrees of Freedom: 479 Total (i.e. Null); 446 Residual

Null Deviance: 661

Residual Deviance: 72.88 AIC: 140.9

> summary(model)

Call:

glm(formula = form, family = binomial(link = "logit"), data = log10(data +

1))

Deviance Residuals:

Min 1Q Median 3Q Max

-3.5042 -0.1073 -0.0134 0.0000 4.0663

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.12624 4.89094 -0.435 0.663758

Number\_of\_Over\_Catches -8.15682 12.12832 -0.673 0.501238

Number\_of\_Catch\_And\_Return\_Null\_AP 6.87264 3.64568 1.885 0.059410

Number\_of\_Destructive\_Wrapping\_AP -3.36523 5.13780 -0.655 0.512471

Number\_of\_Catch\_and\_Do\_Nothing\_AP -5.77311 5.09319 -1.133 0.257006

Number\_of\_Catch\_Generic\_AP 0.07054 1.95974 0.036 0.971285

Number\_of\_Dummy\_Handler\_AP -1.46304 2.33062 -0.628 0.530170

Number\_of\_Ignoring\_Interrupted\_Exception\_AP -27.01777 5132.30155 -0.005 0.995800

Number\_of\_Log\_and\_Throw\_AP 7.98387 6.75248 1.182 0.237062

Number\_of\_Mutliline\_log\_AP 17.03575 8.99592 1.894 0.058262

Number\_of\_Nested\_Try\_AP 9.56468 7.09595 1.348 0.177689

Number\_of\_Relying\_on\_Get\_Cause\_AP 10.30622 5.10745 2.018 0.043604

Number\_of\_Throws\_Generic\_AP 6.64523 3.10385 2.141 0.032277

Number\_of\_Throws\_Kitchen\_Sink\_AP 3.90525 5.29612 0.737 0.460892

Code\_Ownership\_count -1.20819 1.62711 -0.743 0.457760

lines\_added 22.42024 3.99666 5.610 2.03e-08

lines\_deleted 40.08974 9.47884 4.229 2.34e-05

Pre\_release\_bugs -38.50463 10.89501 -3.534 0.000409

AvgCyclomaticModified -10.76700 5.88192 -1.831 0.067171

AvgEssential 4.74819 10.94160 0.434 0.664319

AvgLineBlank -0.88254 5.45006 -0.162 0.871359

AvgLineComment 1.06474 2.74353 0.388 0.697950

CountDeclClass -1.42437 2.56369 -0.556 0.578488

CountDeclClassMethod -3.27758 1.79623 -1.825 0.068047

CountDeclClassVariable 1.44121 1.19566 1.205 0.228060

CountDeclInstanceVariable -0.27321 1.39659 -0.196 0.844904

CountDeclMethodDefault -2.94954 2.19063 -1.346 0.178162

CountDeclMethodPrivate -0.96376 1.74579 -0.552 0.580914

CountDeclMethodProtected -1.14101 1.38109 -0.826 0.408713

CountDeclMethodPublic 0.26140 2.46366 0.106 0.915501

CountLineComment 1.17707 4.05657 0.290 0.771690

MaxEssential -0.34916 1.89769 -0.184 0.854018

MaxNesting 5.38929 3.72308 1.448 0.147747

RatioCommentToCode -10.85901 10.17834 -1.067 0.286029

(Intercept)

Number\_of\_Over\_Catches

Number\_of\_Catch\_And\_Return\_Null\_AP .

Number\_of\_Destructive\_Wrapping\_AP

Number\_of\_Catch\_and\_Do\_Nothing\_AP

Number\_of\_Catch\_Generic\_AP

Number\_of\_Dummy\_Handler\_AP

Number\_of\_Ignoring\_Interrupted\_Exception\_AP

Number\_of\_Log\_and\_Throw\_AP

Number\_of\_Mutliline\_log\_AP .

Number\_of\_Nested\_Try\_AP

Number\_of\_Relying\_on\_Get\_Cause\_AP \*

Number\_of\_Throws\_Generic\_AP \*

Number\_of\_Throws\_Kitchen\_Sink\_AP

Code\_Ownership\_count

lines\_added \*\*\*

lines\_deleted \*\*\*

Pre\_release\_bugs \*\*\*

AvgCyclomaticModified .

AvgEssential

AvgLineBlank

AvgLineComment

CountDeclClass

CountDeclClassMethod .

CountDeclClassVariable

CountDeclInstanceVariable

CountDeclMethodDefault

CountDeclMethodPrivate

CountDeclMethodProtected

CountDeclMethodPublic

CountLineComment

MaxEssential

MaxNesting

RatioCommentToCode

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 661.006 on 479 degrees of freedom

Residual deviance: 72.875 on 446 degrees of freedom

AIC: 140.88

Number of Fisher Scoring iterations: 17

>

> #the values with star are significant so we have to remove which are not significant

> #new formula after removing all the insignificant values

> newform=Post\_release\_bugs>0~lines\_added+lines\_deleted+Pre\_release\_bugs+Number\_of\_Relying\_on\_Get\_Cause\_AP+Number\_of\_Throws\_Generic\_AP

>

> #newmodel after removing all the insignificant values and with new formula

> newmodel=glm(formula=newform, data=log10(data+1), family = binomial(link = "logit"))

Warning message:

glm.fit: fitted probabilities numerically 0 or 1 occurred

>

> summary(newmodel)

Call:

glm(formula = newform, family = binomial(link = "logit"), data = log10(data +

1))

Deviance Residuals:

Min 1Q Median 3Q Max

-5.0922 -0.2331 -0.2331 0.0009 2.7780

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -3.5920 0.3932 -9.136 < 2e-16 \*\*\*

lines\_added 16.6871 2.1663 7.703 1.33e-14 \*\*\*

lines\_deleted 21.6635 4.9095 4.413 1.02e-05 \*\*\*

Pre\_release\_bugs -19.9077 4.8870 -4.074 4.63e-05 \*\*\*

Number\_of\_Relying\_on\_Get\_Cause\_AP 4.6937 3.6378 1.290 0.1970

Number\_of\_Throws\_Generic\_AP 2.4057 1.3853 1.737 0.0824 .

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 661.006 on 479 degrees of freedom

Residual deviance: 99.288 on 474 degrees of freedom

AIC: 111.29

Number of Fisher Scoring iterations: 10

>

> names(newmodel)

[1] "coefficients" "residuals" "fitted.values"

[4] "effects" "R" "rank"

[7] "qr" "family" "linear.predictors"

[10] "deviance" "aic" "null.deviance"

[13] "iter" "weights" "prior.weights"

[16] "df.residual" "df.null" "y"

[19] "converged" "boundary" "model"

[22] "call" "formula" "terms"

[25] "data" "offset" "control"

[28] "method" "contrasts" "xlevels"

> #this gives r square and we can know how good is our model

> 1-newmodel$deviance/newmodel$null.deviance

[1] 0.8497924