Untitled

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```
# Specify the file path
file_path <- "/Users/jaylee/Downloads/100000-Patients/AdmissionsDiagnosesCorePopulatedTable.txt"
# Read the data into a data frame (assuming it's tab-separated)
data_frame <- read.table(file_path, header = TRUE, sep = "\t")
```

```
## Warning in scan(file = file, what = what, sep = sep, quote = quote, dec = dec,
## : EOF within quoted string
```

```
summary(data_frame)
```

```
##   PatientID          AdmissionID     PrimaryDiagnosisCode
##  Length:183329      Min.   : 1.000   Length:183329
##  Class :character   1st Qu.: 1.000   Class :character
##  Mode  :character   Median : 2.000   Mode  :character
##                     Mean   : 2.632
##                     3rd Qu.: 4.000
##                     Max.   :12.000
##  PrimaryDiagnosisDescription
##  Length:183329
##  Class :character
##  Mode  :character
##
##
##
```

```
HCC <- read.csv("/Users/jaylee/Downloads/2024 Midyear_Final ICD-10-CM Mappings.csv")
```

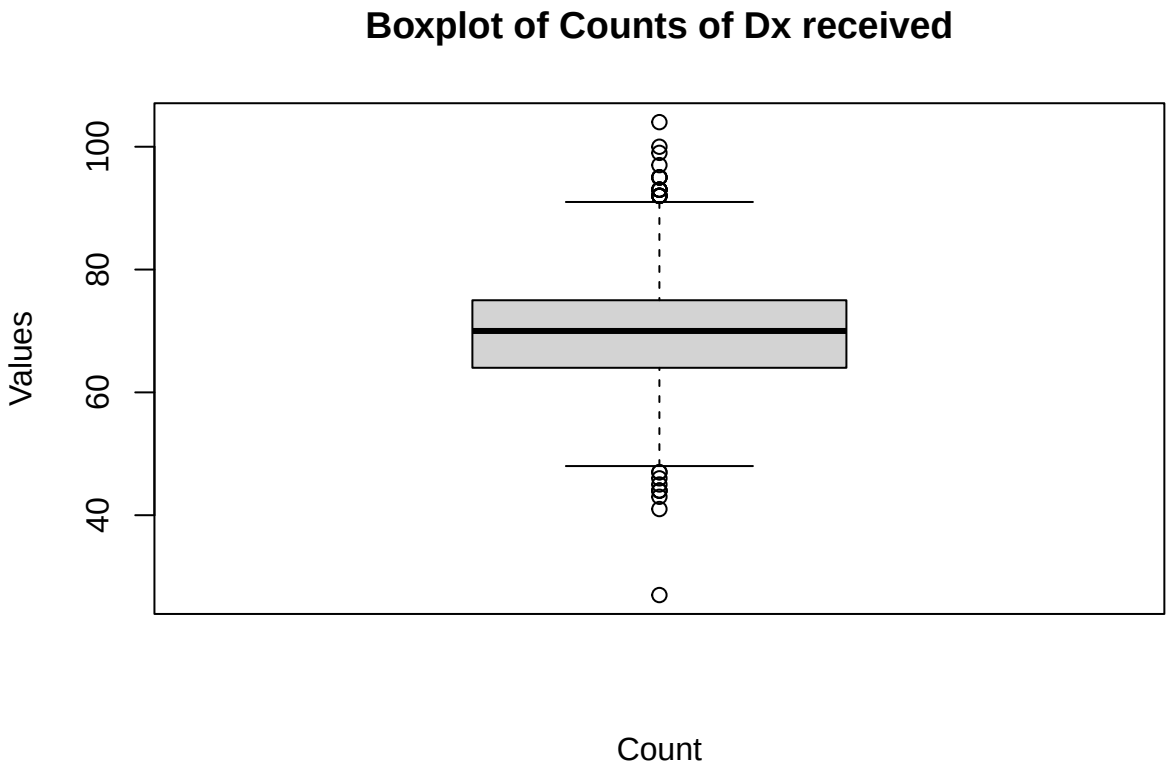
Dx level

```
DXcounts_Perdx <- count(data_frame,PrimaryDiagnosisCode)
countofcountsdx <- count(DXcounts_Perdx,n)
```

```
## Storing counts in `nn`, as `n` already present in input
## i Use `name = "new_name"` to pick a new name.
```

```
countofcountsdx$countoftotalDxinclm <- countofcountsdx$n
countofcountsdx$count <- countofcountsdx$nn
countofcountsdx <- countofcountsdx[, c(3:4)]
```

```r
boxplot(DXcounts_Perdx$n, main = "Boxplot of Counts of Dx received",
        xlab = "Count", ylab = "Values", outline = TRUE)
```




```r
# Calculate quartiles and IQR
Q1 <- quantile(DXcounts_Perdx$n, 0.25)
Q3 <- quantile(DXcounts_Perdx$n, 0.75)
IQR <- Q3 - Q1

# Define lower and upper bounds for outliers
lower_bound <- Q1 - 1.5 * IQR
lower_bound
```

```
##  25%
## 47.5
```

```r
lower_boundDx <- DXcounts_Perdx$n < lower_bound
# Get the patient IDs of outliers
lower_bound_dx <- DXcounts_Perdx$PrimaryDiagnosisCode[lower_boundDx]

# Print or analyze the outliers
print(lower_bound_dx)
```

```
##  [1] "A18.7"   "A42.0"   "C04.0"   "C78.0"   "E71.51"  "F95.2"   "K91"
##  [8] "M05.111" "O99.355" "Z98.62"
```

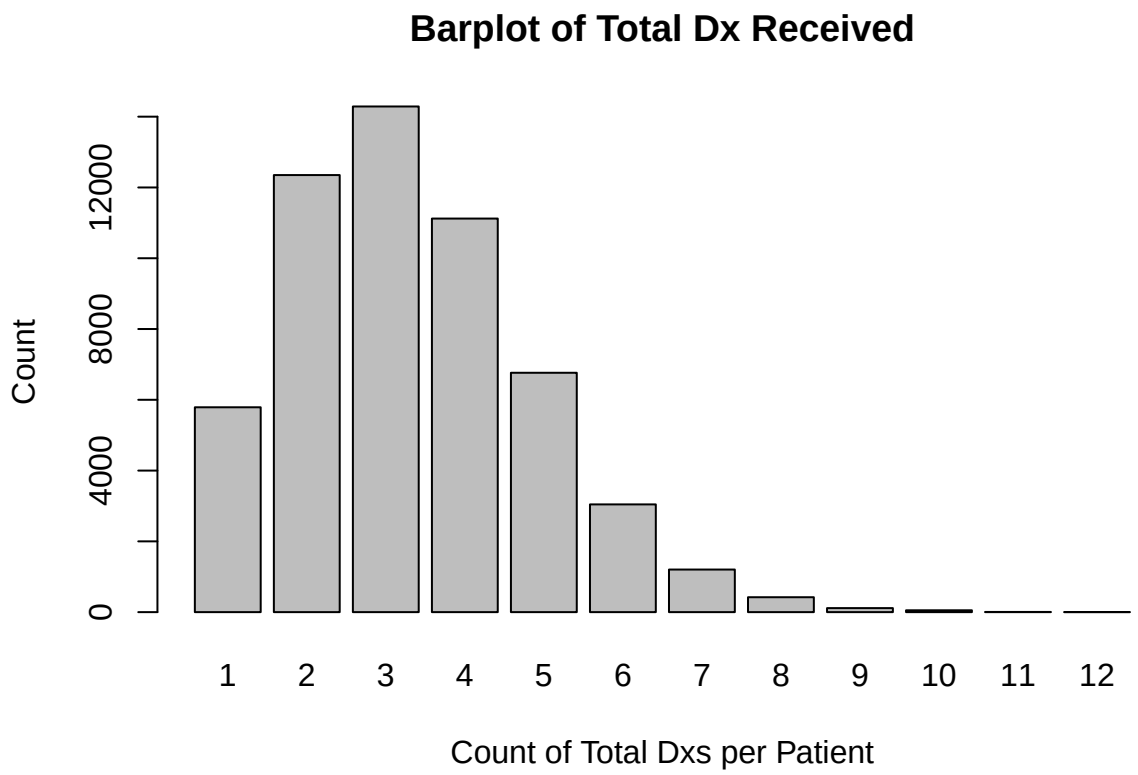
count level

```
DXcounts_Permb <- count(data_frame,PatientID)
countofcounts <- count(DXcounts_Permb,n)
```

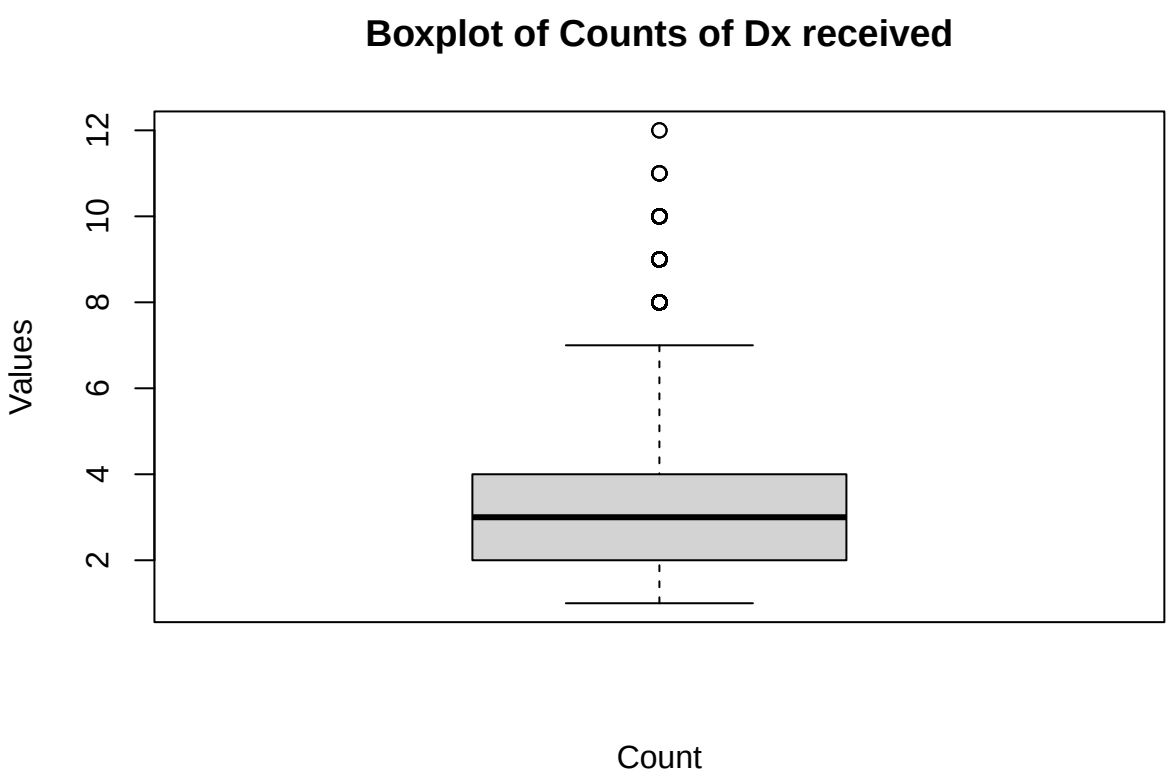
```
## Storing counts in 'nn', as 'n' already present in input
## i Use 'name = "new_name"' to pick a new name.
```

```
countofcounts$countoftotalDxreceived <- countofcounts$n
countofcounts$count <- countofcounts$nn
countofcounts <- countofcounts[, c(3:4)]
```

```
barplot(countofcounts$count, names.arg = countofcounts$countoftotalDxreceived,
        main = "Barplot of Total Dx Received", xlab = "Count of Total Dxs per Patient", ylab = "Count")
```




```
boxplot(DXcounts_Permb$n, main = "Boxplot of Counts of Dx received",
        xlab = "Count", ylab = "Values", outline = TRUE)
```




```
# Calculate quartiles and IQR
Q1 <- quantile(DXcounts_Permb$n, 0.25)
Q3 <- quantile(DXcounts_Permb$n, 0.75)
IQR <- Q3 - Q1

# Define lower and upper bounds for outliers
lower_bound <- Q1 - 1.5 * IQR
upper_bound <- Q3 + 1.5 * IQR

# Identify outliers
outliers <- DXcounts_Permb$n < lower_bound | DXcounts_Permb$n > upper_bound

# Print outliers
outliers_table<-DXcounts_Permb[outliers, ]
outliers_table
```

```
##                                    PatientID  n
## 122   0099E8B4-3430-4AFE-A4C6-CC9590845DCF  8
## 182   00EE88A0-ABCB-4953-B17A-74795E6EC75F  8
## 285   015CFE0F-8BEF-49DB-8DEE-6340B28444E1  8
## 329   018323D0-27B2-4C07-B19F-88DA5E58E503 10
## 352   0196591E-5648-4A8B-926C-BE6D316AA19C  9
## 439   01F1989F-9557-4E4A-92BF-1FE18DA9F492  8
## 771   037B7B08-47A5-43C7-A149-B67F10286FA2  8
## 898   041773BA-67A5-48E2-BB10-184D6A076B57  9
## 1099  050B0CCC-E7C0-462D-8D0B-867BA57A8181  8
```

```
## 1166  05510AF8-CDCD-49F1-9C25-FD73ABAE5730  8
## 1233  05AF3BC7-383A-4F44-8A3A-9FA01D90955C 10
## 1376  06642E71-399D-4400-AF88-D23732A559BE  9
## 1418  06ABABA1-C890-456F-A662-BE752652BABA  8
## 1442  06CE5B58-8083-4CD1-9592-57FDE156147A  9
## 1445  06D95BA8-783A-414C-A7BC-6816B16A0172  8
## 1488  070AB78E-08D7-4394-98FD-F7CB76486753  8
## 1829  08726A0F-7D03-47C2-B0C1-24336EC02725 10
## 1945  08ED5026-BA45-4562-AD13-47D2D59C2BD1  8
## 2247  0A4A0E75-32CA-4EDC-BD29-289672AFC041  8
## 2275  0A6F78E1-E93E-4F16-A5EA-5A5FFD4CF5C9  8
## 2314  0A9D2DFA-F8DD-48EE-8449-620D5FC503DA  8
## 2390  0AEF94B6-5F2F-4750-A61E-E20F647032AD  8
## 2453  0B3EBBFB-834C-4C98-821C-8186D37CD78C  8
## 2470  0B4EF451-BE05-45B6-BB38-E15492C3207A  9
## 2583  0BBFD0D6-1D53-4163-AEA0-1959E7B6DE11  8
## 2655  0C128B89-AEC7-48D0-8DE8-58B53A2F6089  9
## 2665  0C1CFC55-EBA2-42E6-A739-7830178A9C3E  9
## 2774  0CB3B174-FDE9-4505-8C50-4B9F60C96937  8
## 2975  0DC18739-9368-446E-B820-1889DF369030  8
## 2985  0DD13266-E3C3-4606-A933-FE64651C5ECE  9
## 3039  0E0C671A-E9E9-4518-A975-B0741D23CED6  8
## 3073  0E2E1EC8-737F-4BCD-BD98-A627BC4891D0  9
## 3313  0F4B7AA4-6B33-4D5A-96BE-BC4654A464EA  9
## 3397  0FB999EA-2CD2-49C5-A0AF-399A7AE34422  9
## 3406  0FC534DC-3724-41F2-B89E-CA4031090C56  9
## 3472  101E2191-8A89-4F3B-9084-F7F36285B2A5  9
## 3487  1034132F-926F-48F5-9587-0C01FF2DFF9E  8
## 3667  10F356F7-57F3-4E07-8E32-4E0C561A55A3  8
## 3717  111F9AD5-0F23-4141-87BB-0939D10105BD  8
## 3845  11D0E93F-538E-459B-826B-F04D9933BA99  8
## 3867  11E6F90C-F035-41A9-A009-10B1C80AF3CC 10
## 4257  1393F158-9706-4195-8B7A-17B9CD499CEC  9
## 4295  13CA125B-95BD-439B-8759-FEA00129588B  9
## 4606  153FC813-A81E-4D60-8B07-9F226822712B  9
## 4623  15519EA2-0FFE-453F-88BC-4C80FF0A727C  8
## 4683  159BCABE-203F-42B3-BA6E-D999A7BBC924  8
## 4720  15D66F70-CF4A-4620-8E3A-B14897EF5F73  9
## 4733  15E2DABE-2360-40F4-8460-2682FC84E856  8
## 4763  15FBFFAD-51AC-490B-BD69-E4FE85FC463F  8
## 4766  16008259-E0F8-4700-B5B6-8AF79D80F2F1  8
## 4810  16327164-779A-439D-8D98-6F99453A0E50  8
## 4855  1670A1AA-B18F-4045-B146-B5214DF31126  9
## 4935  16D26A09-4E88-4E69-96D1-015AD71CBB0E  9
## 5132  17A3BEE7-4484-47E6-B575-C582F7120722  8
## 5166  17CE8947-DC82-4F84-A3CF-EDCF9DCB0661  9
## 5317  187FC0FA-2668-49C1-9D72-E2AE01356C69  9
## 5322  1886896A-8669-4C64-8931-E840D335923B  8
## 5337  189B3879-410E-4364-9217-81577324B51B  8
## 5439  19032EE5-0B15-431A-A66C-7C27CD0123C1  8
## 5660  1A065BC6-21EF-4C6F-9EA5-CC4775EE5017  9
## 5664  1A0E8719-AD53-424F-A005-185DE351B9B3  9
## 5667  1A14F290-881B-4956-AF8C-EEDD2946DEB5  8
## 5712  1A3F0354-2E0C-4C9D-9982-FD43ED53763F 10
```

```
## 5868  1B1288E3-8F91-4E7E-9C82-7CAB3EF94392  8
## 5875  1B1CAB5D-73BF-45F4-88A1-69B0DEF7365B  8
## 5909  1B46B73E-7674-479A-941A-CC7A7CBEDB86  9
## 6306  1D298E3B-39CC-407A-A5F6-EA1C8869C180  9
## 6370  1D80ADD8-03DE-4F92-918F-CE63E2A44B3F  8
## 6375  1D87B9FB-3C9A-4ED1-AED8-C7DD2E921895  9
## 6650  1EE0464E-15D1-4AF4-B650-D20750D72970  8
## 6779  1F785026-7499-4C37-B9E7-6D51AF800319  9
## 6830  1FAEE7D0-E81F-4F7B-8FC0-2F21F9312053  8
## 6835  1FB5746A-A215-423C-ACC6-7E2A5CA28526  8
## 6969  20786FFB-738A-45DE-A52A-F9C5930FA2F1  8
## 7051  20E95A3D-290B-41CF-9308-F0A576FD99FA  9
## 7077  21001D73-83BC-4578-9D6A-EAF33D6C91DF  9
## 7291  22150952-A0E4-4A5B-B749-EDFB76F37232  8
## 7441  22D46BFB-BC0C-4815-974C-6EB2769B4E1F  8
## 7720  24455841-38F6-4885-8DD2-69C8F0403F27  8
## 7787  2495902F-8233-41AC-A341-F1801AABABFD  8
## 7890  25126828-66E4-431D-B841-8CDCB0A00870  8
## 7916  252EC9CF-E491-441B-B1C4-275DEB5259DF  8
## 7917  252F9DF1-3551-4487-9289-78EC9CED30FB  9
## 8165  264A1261-E466-436F-A92F-AD1427E22693 10
## 8316  26FF9BB9-63C9-4B1C-9107-3FA4EF16527A  8
## 8343  27203DD1-5BD0-4D09-8B72-8DFF1DE95EF9  8
## 8372  274A5EA5-B985-4A53-A148-B2596A21755C  8
## 8407  2774FAE3-B00E-4D95-8808-77BAB9AFAEEB  8
## 8464  27B12B8B-A6F2-4F27-B3A8-624816878334  8
## 8500  27DECD85-123A-49F6-BF90-371C70776536  8
## 8839  296224EF-D6C0-4201-BF09-D2F34A6D81F2 10
## 9030  2A5B0572-1F48-45C2-AF7C-59371DA6CD9F  8
## 9091  2AA27BF6-3ED6-4FA2-AFC5-A3C6BE8B77AD  8
## 9229  2B3316FE-DE9B-4AB2-8EAF-F0D301F3EDD8  8
## 9352  2BCBD5C5-C5DF-4013-9507-CC65B8CF94F7  9
## 9379  2BE75DB1-FCC5-4016-BEB2-607B1CE9E844 10
## 9478  2C5CFC25-8E61-42BF-BEFA-24379A491612  8
## 9557  2CC30EA9-77EA-42FB-9EF1-E9EBA0DEEBC6  8
## 9683  2D5AB113-7999-4A59-A951-7A32222C1658  8
## 9691  2D5F5050-965D-4D65-9D31-41565F6B91FB  8
## 9835  2E0DF0F9-02CB-4387-A423-CBF53852DA92  9
## 9988  2EC6AAB2-FA6A-44E3-914F-5EFEE6664CBD  8
## 10186 2FBBF638-F6BD-45AB-8F37-66A045B6C9F1  8
## 10533 315DE982-BD17-41FF-B90B-8C7B54E7611A  8
## 10579 3191C203-8167-487E-BE7C-AA7A428FBDB8  8
## 10610 31AACDCB-0320-4CC6-B48E-3E06B6E975E4  8
## 10690 3203CFFE-2B24-44AF-96F2-7219C4717E43  8
## 10756 325641F9-2317-4839-BF38-012F42211985  8
## 10790 3286EE01-FBA2-4B96-9791-E66CE7AB77EB  8
## 10806 32970BAB-390C-4340-B9D7-8E04943B7A09 10
## 11000 3375CAF2-5212-4EC5-A3D3-140DB9EBF4A4  9
## 11037 33A37DA2-5AED-43D7-A8A3-FD0E760CD118  8
## 11205 3471C460-8C3B-46B9-ABB9-0A2BD1D40BB5  8
## 11267 34C4DA13-0D4F-4013-80EB-A4103716B12F  8
## 11412 35683DD8-FF40-4B09-8C63-771965875FCB  8
## 11497 35CEB7EA-9FB8-402B-9399-52A4666CEE52  8
## 11796 3752423D-836C-4CEA-8A01-AA00908D2CB8  8
```

```
## 11807 375A0E18-1257-4FC1-B14D-F332EE94131E  8
## 11894 37BA4653-C6D2-4C2B-9CD5-EF2C1C2ABD5A 11
## 11927 37DB91FE-D1AD-47F8-8239-7D26E4AF7D50  8
## 11932 37E48655-79A6-44D3-AF25-C8DABED39DCA  8
## 12204 391F280A-14D3-4FBC-95F1-84D3D6949B92  8
## 12557 3ACDBE90-12D6-4EC4-A4BA-7F0C652E8AA1  8
## 12637 3B45B712-DCDE-45E6-A32D-12840376A369  8
## 12667 3B5F1EF4-0555-4B07-A9EB-E6DDF980EF28  8
## 12701 3B88B03E-C3F8-4A08-B2F4-D4DB3E72347D  9
## 13034 3D0BB9EE-2618-4346-9B43-21439DD0BED6  8
## 13249 3E16D43F-684D-49C2-B2A2-81C3BEAE1665  8
## 13318 3E6A115D-3B7C-4641-AF79-70854B79DFDB  8
## 13333 3E7C745E-9669-4DAD-BD65-A27DF6F4A19A 12
## 13404 3ED20B70-1253-4045-A6C4-01F41BE8F6A0  8
## 13468 3F22EB41-827F-4B8D-88A6-CDFFD0FB57BB 10
## 13633 3FEDC859-7DAC-4EE1-A435-91B4033C192C  9
## 13948 418182A4-41F2-41A0-8990-9843EE645878  8
## 14121 42316455-DEBD-41AA-B8F9-362D5E9ED603  8
## 14315 430F0BAB-F2D3-4C3C-9E48-DEC50B89DFD8  8
## 14360 4339AB3B-6560-49F3-9353-591D2DBF0443  8
## 14370 43410F33-F898-4B1E-97AD-47FA4DF201E6  8
## 14601 444E5AAB-9A62-4A64-8BE8-CFBDEEC799C1  8
## 14637 447D40B4-EEC9-4627-943E-06D0558ED7B9  9
## 14892 45A49ECA-A92C-4ACA-803F-5703951F50AB  8
## 14988 462C0508-F0F5-4403-B9F6-32E88410DE4A  8
## 15050 466D4136-6DAB-4FD3-8251-A2E91C926910  9
## 15091 4694BD5C-B2E4-4EF7-B453-90FF47F52E6A  8
## 15218 473CA41F-0F4A-49EE-A238-87F05B9A2E55  8
## 15268 4778C81E-486E-4999-BA27-6605F5903FE3  9
## 15477 4881540D-094A-426B-8B7B-A81470741479  8
## 15556 48EB72EA-3BBB-48B3-B639-A31AF911BEC5  8
## 15779 49F67FB9-614F-409D-B0DD-D8E62747D349  8
## 15968 4AC213A2-07BB-4C04-88B9-3477FE62CB97  8
## 15989 4AD39190-8BB0-48B7-B0F9-5B2D76727CDC  9
## 16056 4B3498D9-3DE4-4A13-B86E-10ACF8CDB4DE  8
## 16157 4BAE7171-953D-4C9F-8170-1320AE851044 10
## 16295 4C5082E8-8074-4E0D-AE52-EC91C19DF08A  8
## 16331 4C807208-74A1-4D45-A4B9-B0B0E57C9E93  8
## 16377 4CB587B8-4CD0-45D6-8388-39DDB324793A  8
## 16380 4CB89CC6-3D48-4118-AD86-D83980AFB6FA  8
## 16406 4CD17776-DE07-4C6D-880C-E788B60DD561  8
## 16461 4D0E6797-201E-4BC4-A351-A13F21BEE047  8
## 16542 4D861255-E8EB-448C-8AEA-49F6281A3AA6 10
## 16611 4DD532E4-A28F-4EF3-842E-B7F689D1B572  8
## 16764 4EA93C66-072D-4B4E-9794-0D74B09FE549  8
## 16929 4F5F798C-EC7F-49DB-BE75-E601A973C98A 10
## 17074 50222A29-8CC3-4CD2-A969-F0A6F09B9ED6  8
## 17175 50A8761D-D2CC-4D31-875F-C02007C436E7  9
## 17309 513CC9A9-85B8-49DE-B247-8FD3E28D4A5F  8
## 17328 515308A3-BF9F-4DDB-9CB2-B79ADC31C9F8  8
## 17414 51C8DAF4-9957-41FA-B51D-5ED9A9D1044F  8
## 17416 51C95EDB-2F73-41DF-BE2E-3A2C234FF4F6 10
## 17486 520F6C77-4F29-460C-8A6E-A9591EA50160  8
## 17510 522A4A39-90BF-4B63-9DF1-43AFF62AF4F7  9
```

```
## 17513 522E5361-A28C-438D-9EED-C9028C667F21  8
## 17543 525F0F37-E55E-4119-BF0D-BAB4E6F4CE17  8
## 17606 52A77331-6D9E-41B9-BCAE-65B72A08B83F  8
## 17716 533EBF7B-FE0A-403E-9CF9-FD74C173AF38  9
## 17831 53CA652E-A846-468F-A800-E6BEFF057B2A  8
## 17839 53D37E20-8E05-4A47-8066-137AD3440DEB  8
## 18027 54B76A2F-33AC-40E4-BD9E-FEA85F91EF13  8
## 18322 56184B07-B529-42A8-809B-A4303910ADDD  8
## 18407 568B9017-CA93-4192-8721-CC212D1E27F5  9
## 18448 56C07841-27D4-4F51-A359-10B91FF7981D  8
## 18494 56FCAB97-1C39-4D35-A92C-9FDE07B13FAB  9
## 18503 570AB5A9-846D-49DD-B3D7-51697F055F28  8
## 18551 5743FC2F-D480-4B36-B619-31D42333A3D5  8
## 18625 57B295DF-8DB5-4964-B70E-FC29D28760BF 10
## 18716 581788CD-C81A-4524-899A-D52766FD8AF3  8
## 18887 58C46B26-DF78-497A-8AA9-088FDF161DC8  8
## 18999 59313349-025C-4BD7-BD03-8B9502DBE1C6  8
## 19062 59778759-6BDC-4670-8299-C9A6BE538D6A  8
## 19065 597AF507-7525-42C0-A670-BF38EC618570  8
## 19146 59C37EF7-92F9-4FDB-9BA0-BFF3730D2752  8
## 19207 5A0AB64A-CAE1-4565-8874-2B5AFC6D4087  8
## 19225 5A21529B-E842-4EE2-9F80-24D9CBB29085  9
## 19237 5A333B87-9E6A-4E93-9451-DB0CDD54EE47  8
## 19329 5A8BAF66-45B0-4D97-A719-C2B3C7927EA4  8
## 19393 5AE45FCF-12FB-4C54-B03C-E474904148B7  8
## 19420 5B05A6A5-07B4-4DE9-ABFC-38938CE850B8  8
## 19458 5B2CC231-58E8-4DDD-A878-DD3F261CF5D3  8
## 19660 5C0D6CE3-6B5C-4F56-A9C3-CC88ED54C09F  8
## 19806 5CC2C0A7-FBD6-4252-B0AE-B955A2F82D5F  8
## 19823 5CCB2DB5-EE9F-4AE9-8AD6-303E63F40868  9
## 19960 5D605F59-884A-4B79-BA53-AB9CF8111A89  9
## 20133 5E2BC804-A83A-447B-904B-B1E553857801 12
## 20219 5E8B80CF-8FC5-4135-9985-83268B7D3138  8
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## 42026 C4122F58-B5EB-49AF-9082-8457529D1021  8
## 42053 C42A53AD-71C7-474E-94BE-D64FDC699BB9  8
## 42159 C4A2C1B4-0307-44B4-9437-1E4673D8F4DC  9
## 42246 C50AF9D1-D40E-45E2-91F2-E37DD75B00F1  8
## 42416 C5A6A2E9-37E9-4D51-A481-788CCB8D51CC  8
## 42683 C6D7C402-EC6C-44F4-BCBE-9475082E811F  9
## 42882 C7E706BB-C302-40FB-AAB9-4F4940301D02  8
## 42974 C85A2D1D-A91D-4C6C-A662-979633F3B3BC  8
## 43001 C877B1DA-15D9-44CC-8F8B-8E9BC6E01726  9
## 43161 C94DFBE9-7E77-42CB-83B7-6D29C73A43A2  9
## 43194 C96AAABC-3ECB-4864-9CFF-89F6EEBB0889  8
## 43196 C96B6480-D207-49F8-AB68-AC548285FE1A  8
## 43257 C9AD5F57-BC30-45A7-920B-399BCF24F48F  8
## 43278 C9C8B15D-95AF-4C10-ADDE-6229A283AD2A  8
## 43285 C9CCF97F-58EC-4B9F-9790-D25B12259370  8
## 43321 C9F77ACE-4A23-4E34-94E5-F514BA430585  8
## 43349 CA16129D-4431-44F8-954F-DE62C9422B0E  9
## 43353 CA166370-51F8-4FDE-962A-3919B8BDA4DD  8
## 43476 CA9BC76A-FE22-4D23-AB12-74A4DC97B08C  8
## 43481 CAA0B542-D2B1-454B-8B7E-B92368725443  9
## 43569 CAFEA055-04B2-4C91-BAFA-BABE1508930C  8
## 43590 CB105CB7-5DED-43B6-8143-623FDCE3C97E  8
## 43685 CB7C097B-4F43-4EA2-ABD1-780A41B503CE  8
## 43740 CBC0515C-D771-45AB-BD17-1B2F42238903  8
## 43808 CC092E24-B617-44C3-A8C7-51FEFF750BC9  8
## 43897 CC64C958-D134-46C5-A781-B785C50DA5EA  8
## 44243 CDE2D97E-8C60-47FA-8FD8-D7618FCD40B9  8
## 44295 CE293319-06BD-4824-A2CA-07F9DDD4CDEA  8
## 44415 CEBFD2A3-7587-4176-BC3B-725CD00EBC0A  8
## 44439 CED7ECD4-2C19-4ED1-A316-F992D436FDFC  9
## 44565 CF7BEE19-1512-469E-8829-FAF27FFBA3E0  8
## 44652 CFF2F2B7-479A-412D-88B0-416DF1B6F317  8
## 44752 D074839A-D7DA-4F16-AAAD-CF1B610AA9FF  8
## 44760 D07F8B8F-278A-4545-B067-2D9536354DCF  9
```

```
## 44843 D0DFEFA2-8D10-42BA-831F-3AA9412C859C  9
## 44874 D1018026-364F-40B4-AA9C-CE30859493F9  8
## 45073 D1F6864D-33DC-4F7F-8672-A29DE24086D2  8
## 45333 D34A68A4-36FD-4374-B7B2-266069A37FBD 10
## 45391 D385042F-0C33-4AC1-A800-757163BA878B  9
## 45504 D4087BEC-E0ED-436D-9142-7EEF60AADA5B  8
## 45707 D50519F0-A5B7-4A25-8053-1F9571B857B8  8
## 45811 D57A3E03-AA4B-4FD1-9BAC-D42469F7C824  8
## 45849 D5A71B3D-B8EF-4D3D-BBEF-006C5CD31397  9
## 45855 D5AD83DC-A6B8-4729-B170-61794B4E9C98  8
## 46361 D82D81E7-E726-40D6-80B6-4B1158B37952 10
## 46499 D8C2F924-BCFD-4E4E-B6D4-927C92AF290F  9
## 46588 D9275D8D-22F9-436E-879F-2F5AAABA0156  9
## 46619 D94548DC-4702-4749-8636-202A11C4C771  8
## 46672 D97F8EDF-0819-44CE-8DD7-6FB1D42BBBA8  8
## 46710 D9AF9302-A665-44A7-9B89-1BF57712D004  8
## 46754 D9E6BB1E-6AEE-4E9C-A99A-FE70D503D588  8
## 46938 DAB5D5F6-3340-4BF2-82D7-3951D15E8CE1  8
## 47053 DB1CFBC1-6F8E-4C97-82B0-A26CA129B31F  9
## 47268 DC0F89DB-F34C-4965-B0C5-A98FEED13834  9
## 47323 DC593135-86F5-4D2D-A313-A4FD1B39A145  8
## 47409 DCC96E95-0CEB-4FDB-B8FE-E9841503B853  8
## 47437 DCE9CEA5-1210-476D-9511-CF558E7FB49D  8
## 47459 DCFE1FD3-0EAF-4648-8DA1-044258E87159  8
## 47567 DD821CB9-5516-4938-8A71-F99C31B8C998  9
## 47607 DDAB73DC-76FC-4A22-BFD5-8FBEDA6F106B  8
## 47688 DE034F92-2E71-445F-A39C-BBEED538AE55  8
## 47742 DE438E2E-A50C-4F02-BC85-A45D8B3BB4E3  8
## 48238 E06255B0-920C-420A-8293-1EC107980854  8
## 48563 E1E5FD8C-AD79-46C0-ABFB-CC7DE5FE659B 10
## 48696 E28AE45A-D37D-4599-A551-341B4F249B36  8
## 48926 E3AA2C1B-DDBF-446A-9DF2-F41098299104  8
## 48993 E40292B4-9994-4FA0-915D-7891AAC55E22  8
## 49200 E4F2CB08-7CE6-4E9F-8D08-7C16BE1BEC82  8
## 49337 E587646E-28A8-40E5-AFD1-4320E75AE8DD  8
## 49383 E5B75155-7B0A-4C41-AE22-486DCBB6501E  8
## 49740 E783ABD5-392E-4FD8-9F8E-A0181F126CAC  9
## 49985 E8A749B4-F16C-42F0-A0A6-DC5E4E975A7E  8
## 50037 E8E268B1-6CD7-45AB-89E7-6F6BC8DB5789  9
## 50059 E8F95A73-2047-437B-BCFF-8A1EFDC786CE  8
## 50075 E90E7088-02BF-483F-82F5-E018ECF5D47F  9
## 50092 E9177526-2483-4AB1-8884-C5E0914E6C16  8
## 50183 E972231D-DCCA-4294-99AB-88E3FB50D137  8
## 50432 EA89D4D6-95C4-418F-AA75-E66BBD3D4327  8
## 50483 EACD7CB0-F011-4893-9EED-76518660216A  8
## 50543 EB08119D-EE22-477E-A71F-65940C874A3E  8
## 50578 EB38BA27-9D38-49BE-A2FC-18A99AB73E87  8
## 50656 EB902361-7C92-4869-B49E-705F5EA9B7CE  9
## 50954 ECFDCFA1-86E6-4BE7-B8EB-D90FC09DC45F  8
## 50965 ED0A709E-D984-415F-94EF-40143CA2CB61  8
## 51011 ED3A28E9-9DA3-4E0E-8D36-DA6F656395AB  8
## 51102 EDB529B4-0A86-47F1-88A0-7C04BF582395  8
## 51161 EDF55F94-5800-4EDB-92DD-BEF946679A4D  8
## 51193 EE17F569-EAA2-4F98-8EE7-40FD3A393FF2  8
```

```
## 51272 EE7E3ECA-CA39-4FDB-9F6D-D545B70760D8  8
## 51300 EE9CC512-66B0-42B2-AE21-80D2BC2C008D  8
## 51329 EEBA3CBD-FC11-4562-91DA-465C8E39DB8E  8
## 51334 EEC26C6B-1261-4E0D-BC3F-98377169F42C  8
## 51367 EEE20353-6043-4966-A28B-5E4ADD2CC835  8
## 51370 EEE43760-A615-483C-96EB-A3A864B48D5F  9
## 51581 EFB4DD02-C07F-40D4-A9AD-3D2FA8232DCA  8
## 51604 EFD462A9-8E89-4E7B-849E-7C56E349D112  8
## 51610 EFDB860C-0CB0-4E12-ACA6-C77CA632B9AF  8
## 51662 F00A2D72-B5D0-4812-87C1-C8E4896BBBC4 10
## 51719 F03D68FA-1960-462C-8D4E-C151F1EE5047 10
## 51774 F0863063-C4FF-485C-8090-9AE67933D38B  8
## 51790 F09BA04A-74C5-4CD9-9067-068F0DB2823F  8
## 51804 F0AB45A7-C572-40AA-8C83-83BF904BB505  8
## 51967 F15D514E-441C-4D20-9FE6-5C79027C82AC  8
## 52071 F1CA5A4E-773B-4BAD-9C61-6AC52B809BA2  8
## 52155 F223BABD-9BB6-43D9-ACC4-B89A98D10923 10
## 52210 F26C555B-6E05-49E9-91CC-0A03FC6E00A9 10
## 52281 F2C4EF27-9AED-4EDC-A7ED-D3B49C72E63A  8
## 52349 F3124095-E3A1-4093-ABE0-DCD78804A0FE  8
## 52409 F353E206-B2FE-4B24-A747-EEAA38276B29  8
## 52606 F433B154-C61F-4204-A7AF-3A63885324E0  8
## 52704 F4A2E4EA-919E-44B9-9E11-211AA743BB07  8
## 52803 F51991C5-780C-456D-AEFC-AAEE09494D74  8
## 52891 F5780C8C-937B-42EF-AA5E-1821258F2B72 10
## 52930 F5A13C1D-7E81-45EA-8E41-69F03E184F32  8
## 53025 F602E33C-2948-4692-B409-5DEFAB91E1F7  8
## 53053 F629035A-3020-463C-85D4-D4E9E47B6172  8
## 53203 F6ED5D79-2151-4F3E-A180-089804F07D2C  8
## 53329 F790CDBB-51D6-45EB-9286-643841FA0339 10
## 53393 F7DDFF35-631F-4A0A-84FE-4C3D520FF767  8
## 53487 F8480677-527F-4083-AC1B-FC10C3978C00  8
## 53620 F8D42755-4D58-42C0-ACAB-94ABEC9DA806  8
## 53731 F953861F-0A97-4660-9BE8-C72D5CDD7D00  9
## 53745 F964D539-DC8F-44AE-BB38-5D7DB8E57035  8
## 53781 F98E35B7-FCA7-4435-8881-528D8721FA2D  9
## 54114 FB0B93BF-C089-4C4B-9C4B-28CB9AED3E69  8
## 54161 FB51E4FD-B73A-4015-BB67-9BD7B147AA1A  8
## 54310 FC16997B-E739-4EB9-91CE-9C4F36A008EC  8
## 54583 FD660637-063A-44DC-979E-50BFD767507B  8
## 54623 FD997D52-DC94-4462-B853-A31FA633ECBF  8
## 54788 FE4CA30C-928C-4362-835C-02740145A910  8
## 54789 FE4D4ADD-65BE-484F-AC93-7852D061959C  8
## 54942 FF062E1B-B27D-4AF4-9199-39D1AB4FAC2D  9
## 54950 FF0D3BFC-6BA6-4692-BDEF-023316C2B3C0  9
```

```
DXcounts_outlier <- count(outliers_table,n)
```

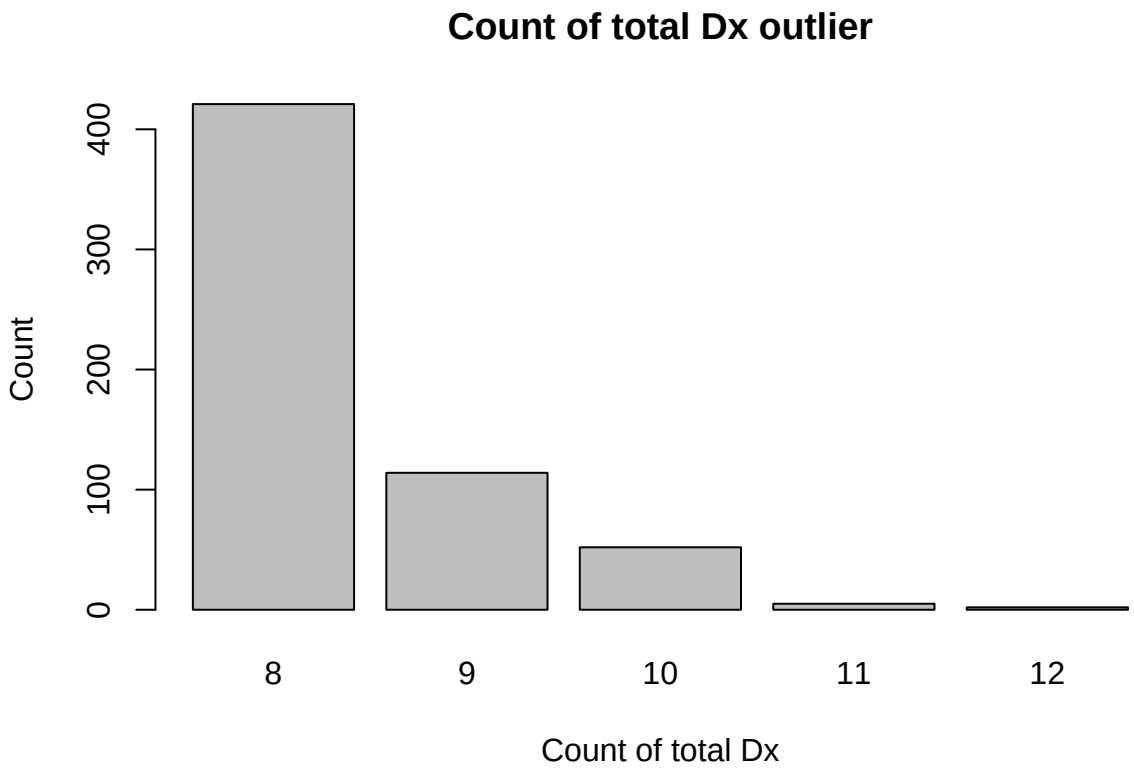
```
## Storing counts in `nn`, as `n` already present in input
## i Use `name = "new_name"` to pick a new name.
```

```
DXcounts_outlier$outlier_dxcount <- DXcounts_outlier$n
DXcounts_outlier$outlier_count <- DXcounts_outlier$nn
```

```
DXcounts_outlier <- DXcounts_outlier[, c(3:4)]
DXcounts_outlier
```

```
##   outlier_dxcount outlier_count
## 1               8           421
## 2               9           114
## 3              10            52
## 4              11             5
## 5              12             2
```

```
barplot(DXcounts_outlier$outlier_count, names.arg = DXcounts_outlier$outlier_dxcount,
        main = "Count of total Dx outlier", xlab = "Count of total Dx", ylab = "Count")
```




```
grouped_df <- data_frame %>%
  group_by(PatientID) %>%
  summarise(GroupedDiagnosisCodes = paste(PrimaryDiagnosisCode, collapse = ", "))
```

```
df_split <- separate(grouped_df, GroupedDiagnosisCodes, into = c("Diagnosis1", "Diagnosis2", "Diagnosis3
```

```
## Warning: Expected 12 pieces. Missing pieces filled with `NA` in 55149 rows [1, 2, 3, 4,
## 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, ...].
```

```r
non_na_counts <- colSums(!is.na(df_split))
print(non_na_counts)
```

```
##   PatientID  Diagnosis1  Diagnosis2  Diagnosis3  Diagnosis4  Diagnosis5
##       55151       55151       49363       37013       22725       11604
##  Diagnosis6  Diagnosis7  Diagnosis8  Diagnosis9 Diagnosis10 Diagnosis11
##        4841        1797         594         173          59           7
## Diagnosis12
##           2
```

```r
df_touse <- df_split[, c(1:6)]
df_touse <- na.omit(df_touse)
```

```r
library(e1071)

# Assuming 'data' contains the patient data

# Select diagnosis columns
diagnosis_columns <- c("Diagnosis1", "Diagnosis2", "Diagnosis3", "Diagnosis4", "Diagnosis5")

# Convert diagnosis codes to factors (if not already)
diagnosis_data <- df_touse %>% select(all_of(diagnosis_columns))

# Perform one-hot encoding
diagnosis_data <- lapply(diagnosis_data, function(x) {
  as.integer(factor(x, levels = unique(unlist(diagnosis_data))))
})

# Combine the encoded columns into a single data frame
diagnosis_data <- do.call(cbind, diagnosis_data)

# Perform anomaly detection using One-Class SVM
model <- svm(diagnosis_data, type = "one-class", kernel = "radial")

# Set a threshold for anomaly score
threshold <-0.5

# Predict anomaly scores
anomaly_scores <- predict(model, diagnosis_data, decision.values = TRUE)

# Get outlier indices
outliers <- which(anomaly_scores > threshold)

# Get the patient IDs of outliers
outlier_patient_ids <- df_touse$PatientID[outliers]

# Print or analyze the outliers

summary(outlier_patient_ids)
```

```
##    Length     Class      Mode
##      5800 character character
```

```r
# Train isolation forest model
model2 <- randomForest(diagnosis_data[, -1], ntree = 100, proximity = TRUE, seed = 1)

# Calculate anomaly score
proximity_matrix <- model2$proximity
anomaly_score <- apply(proximity_matrix, 1, mean)

# Define threshold for anomalies
threshold <- quantile(anomaly_score, 0.95)

# Predict anomalies
anomalies <- ifelse(anomaly_score > threshold, 1, 0)

# Extract rows with anomalies
anomaly_rows <- df_touse[anomalies == 1, , drop = FALSE]

nrow(anomaly_rows)
```

```
## [1] 581
```