

crime_analysis2

2024-03-27

Load in Data

```
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.3.2
```

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.3.2
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.3.2
```

```
##
```

```
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
```

```
##
```

```
## filter, lag
```

```
## The following objects are masked from 'package:base':
```

```
##
```

```
## intersect, setdiff, setequal, union
```

```
library(reshape2)
```

```
## Warning: package 'reshape2' was built under R version 4.3.2
```

```
# Specify the file path
```

```
file_path <- "C:/Users/jans7/OneDrive - Marquette University/SP24/COSC 6510 - Data Intelligence/KC_Schools.xlsx"
```

```
# Read in the Excel file
```

```
school_data <- read_excel(file_path)
```

```
# View the first few rows of the data
```

```
(school_data)
```

```
## # A tibble: 36 x 8
##   Level      SchoolName      Address City State ZipCode Latitude Longitude
##   <chr>      <chr>      <chr>  <chr> <chr>  <dbl>    <dbl>    <dbl>
## 1 Secondary African-Centered Co~ 3500 E~ Kans~ MO      64132     39.0     -94.5
## 2 Primary  African-Centered Pr~ 6410 S~ Kans~ MO      64130     39.0     -94.6
## 3 Primary  Benjamin Banneker E~ 7050 A~ Kans~ MO      64132     39.0     -94.5
## 4 Primary  Border Star Montess~ 6321 W~ Kans~ MO      64113     39.0     -94.6
## 5 Secondary Central High School 3221 I~ Kans~ MO      64128     39.1     -94.5
## 6 Secondary Central Middle Scho~ 3611 L~ Kans~ MO      64128     39.1     -94.5
## 7 Secondary East High School 1924 V~ Kans~ MO      64127     39.1     -94.5
## 8 Primary  Faxon Elementary Sc~ 1320 E~ Kans~ MO      64109     39.1     -94.6
## 9 Primary  Foreign Language Ac~ 3450 W~ Kans~ MO      64111     39.1     -94.6
## 10 Primary Garfield Elementary~ 436 Pr~ Kans~ MO      64124     39.1     -94.6
## # i 26 more rows
```

```
# Specify the file path
```

```
file_path <- "C:/Users/jans7/OneDrive - Marquette University/SP24/COSC 6510 - Data Intelligence/crimeda
```

```
crime_data_clean <- read.csv(file_path)
```

```
# View the first few rows of the data
```

```
head(crime_data_clean)
```

```
##   X Reported_Date      Description      Address      City
## 1 1      03/06/2015      Misc Violation      BROADWAY and WESTPORT RD KANSAS CITY
## 2 2      09/21/2015      Aggravated Assault (      <NA>      <NA>
## 3 3      09/21/2015      Family Offense      <NA>      <NA>
## 4 4      09/08/2015      Auto Theft      PROSPECT AV and E TRUMAN RD KANSAS CITY
## 5 5      05/19/2015      Possession/Sale/Dist      VICTOR ST and WALROND AV KANSAS CITY
## 6 6      08/31/2015      Non Aggravated Assau      PASEO and E TRUMAN RD KANSAS CITY
##   Zip.Code Rep_Dist Area Age Latitude Longitude      Date
## 1      64131    PJ3229  CPD  NA    38.9767    -94.5767 2015-03-06
## 2      99999      <NA> <NA>  NA         NA         NA 2015-09-21
## 3      99999      <NA> <NA>  NA         NA         NA 2015-09-21
## 4      64126    PJ7474  EPD  NA    39.0947    -94.5516 2015-09-08
## 5      64128    PJ2340  EPD  NA    39.0735    -94.5461 2015-05-19
## 6      61109    PJ1326  CPD  29         NA         NA 2015-08-31
```

```
# Specify the file path
```

```
file_path <- "C:/Users/jans7/OneDrive - Marquette University/SP24/COSC 6510 - Data Intelligence/school_
```

```
school_crimes <- read.csv(file_path)
```

```
# View the first few rows of the data
```

```
head(school_crimes)
```

```
##       Level      SchoolName
## 1 Secondary      African-Centered College Preparatory Academy
## 2 Primary  African-Centered Preparatory Academy Lower Campus
## 3 Primary      Benjamin Banneker Elementary School
## 4 Primary      Border Star Montessori School
## 5 Secondary      Central High School
## 6 Secondary      Central Middle School
```

| ## | Address | City | State | ZipCode | Latitude | Longitude | | |
|------|---------------------------|-------------|----------|----------|----------|-----------|----------|----------|
| ## 1 | 3500 East Meyer Boulevard | Kansas City | MO | 64132 | 39.04205 | -94.53179 | | |
| ## 2 | 6410 Swope Parkway | Kansas City | MO | 64130 | 39.00981 | -94.57273 | | |
| ## 3 | 7050 Askew Avenue | Kansas City | MO | 64132 | 38.99916 | -94.54532 | | |
| ## 4 | 6321 Wornall Road | Kansas City | MO | 64113 | 39.01328 | -94.59303 | | |
| ## 5 | 3221 Indiana Ave | Kansas City | MO | 64128 | 39.06652 | -94.54248 | | |
| ## 6 | 3611 Linwood Boulevard | Kansas City | MO | 64128 | 39.06680 | -94.53974 | | |
| ## | X01.2015 | X02.2015 | X03.2015 | X04.2015 | X05.2015 | X06.2015 | X07.2015 | X08.2015 |
| ## 1 | 297 | 285 | 349 | 328 | 391 | 370 | 367 | 450 |
| ## 2 | 280 | 290 | 277 | 271 | 343 | 344 | 499 | 339 |
| ## 3 | 295 | 270 | 274 | 263 | 343 | 335 | 433 | 312 |
| ## 4 | 89 | 108 | 113 | 90 | 115 | 81 | 134 | 115 |
| ## 5 | 446 | 383 | 507 | 520 | 443 | 561 | 609 | 598 |
| ## 6 | 429 | 364 | 475 | 515 | 419 | 517 | 576 | 592 |
| ## | X09.2015 | X10.2015 | X11.2015 | X12.2015 | X01.2016 | X02.2016 | X03.2016 | X04.2016 |
| ## 1 | 384 | 354 | 320 | 309 | 337 | 376 | 375 | 429 |
| ## 2 | 369 | 336 | 366 | 273 | 365 | 258 | 307 | 296 |
| ## 3 | 295 | 299 | 336 | 293 | 338 | 336 | 298 | 320 |
| ## 4 | 119 | 123 | 142 | 89 | 130 | 76 | 101 | 98 |
| ## 5 | 623 | 469 | 524 | 500 | 527 | 456 | 574 | 503 |
| ## 6 | 588 | 467 | 511 | 481 | 548 | 447 | 559 | 507 |
| ## | X05.2016 | X06.2016 | X07.2016 | X08.2016 | X09.2016 | X10.2016 | X11.2016 | X12.2016 |
| ## 1 | 381 | 328 | 456 | 443 | 450 | 337 | 397 | 245 |
| ## 2 | 407 | 402 | 371 | 434 | 352 | 409 | 363 | 264 |
| ## 3 | 414 | 318 | 402 | 390 | 373 | 348 | 278 | 223 |
| ## 4 | 139 | 118 | 135 | 137 | 132 | 171 | 168 | 136 |
| ## 5 | 506 | 637 | 683 | 697 | 582 | 583 | 455 | 303 |
| ## 6 | 508 | 609 | 669 | 677 | 588 | 583 | 416 | 291 |
| ## | X01.2017 | X02.2017 | X03.2017 | X04.2017 | X05.2017 | X06.2017 | X07.2017 | X08.2017 |
| ## 1 | 181 | 155 | 195 | 163 | 180 | 187 | 231 | 171 |
| ## 2 | 251 | 233 | 245 | 194 | 224 | 296 | 282 | 246 |
| ## 3 | 273 | 242 | 271 | 222 | 220 | 289 | 292 | 197 |
| ## 4 | 107 | 60 | 66 | 85 | 88 | 64 | 75 | 84 |
| ## 5 | 412 | 294 | 439 | 478 | 495 | 514 | 433 | 519 |
| ## 6 | 365 | 232 | 408 | 384 | 424 | 454 | 374 | 466 |
| ## | X09.2017 | X10.2017 | X11.2017 | X12.2017 | X01.2018 | X02.2018 | X03.2018 | X04.2018 |
| ## 1 | 235 | 180 | 169 | 176 | 189 | 103 | 235 | 239 |
| ## 2 | 280 | 223 | 249 | 164 | 221 | 189 | 212 | 152 |
| ## 3 | 262 | 218 | 203 | 160 | 184 | 134 | 211 | 167 |
| ## 4 | 100 | 98 | 93 | 60 | 70 | 73 | 86 | 57 |
| ## 5 | 567 | 469 | 395 | 358 | 396 | 468 | 438 | 431 |
| ## 6 | 490 | 403 | 324 | 311 | 313 | 433 | 384 | 400 |
| ## | X05.2018 | X06.2018 | X07.2018 | X08.2018 | X09.2018 | X10.2018 | X11.2018 | X12.2018 |
| ## 1 | 229 | 214 | 220 | 196 | 169 | 218 | 145 | 210 |
| ## 2 | 238 | 221 | 267 | 217 | 205 | 205 | 191 | 185 |
| ## 3 | 253 | 232 | 223 | 202 | 208 | 212 | 237 | 181 |
| ## 4 | 116 | 77 | 89 | 95 | 112 | 68 | 56 | 31 |
| ## 5 | 514 | 412 | 476 | 451 | 441 | 495 | 440 | 316 |
| ## 6 | 454 | 388 | 445 | 405 | 408 | 432 | 389 | 298 |
| ## | X01.2019 | X02.2019 | X03.2019 | X04.2019 | X05.2019 | X06.2019 | X07.2019 | X08.2019 |
| ## 1 | 162 | 133 | 108 | 161 | 149 | 117 | 145 | 134 |
| ## 2 | 171 | 164 | 219 | 245 | 192 | 186 | 263 | 164 |
| ## 3 | 192 | 153 | 173 | 226 | 177 | 152 | 248 | 146 |
| ## 4 | 60 | 38 | 43 | 82 | 52 | 50 | 39 | 54 |

| | | | | | | | | |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 5 | 381 | 244 | 402 | 455 | 450 | 398 | 441 | 415 |
| ## 6 | 374 | 247 | 387 | 418 | 399 | 352 | 405 | 394 |
| ## | X09.2019 | X10.2019 | X11.2019 | X12.2019 | X01.2020 | X02.2020 | X03.2020 | X04.2020 |
| ## 1 | 147 | 133 | 118 | 104 | 158 | 119 | 125 | 147 |
| ## 2 | 234 | 216 | 152 | 165 | 156 | 174 | 210 | 169 |
| ## 3 | 248 | 191 | 163 | 127 | 171 | 158 | 179 | 179 |
| ## 4 | 79 | 60 | 58 | 60 | 28 | 45 | 58 | 39 |
| ## 5 | 363 | 347 | 314 | 252 | 375 | 345 | 371 | 361 |
| ## 6 | 351 | 300 | 289 | 229 | 371 | 343 | 336 | 346 |
| ## | X05.2020 | X06.2020 | X07.2020 | X08.2020 | X09.2020 | X10.2020 | X11.2020 | X12.2020 |
| ## 1 | 170 | 170 | 159 | 189 | 177 | 140 | 125 | 123 |
| ## 2 | 221 | 256 | 200 | 242 | 167 | 207 | 186 | 184 |
| ## 3 | 217 | 220 | 241 | 247 | 201 | 185 | 171 | 163 |
| ## 4 | 50 | 70 | 53 | 72 | 80 | 73 | 86 | 66 |
| ## 5 | 429 | 525 | 451 | 464 | 477 | 429 | 383 | 263 |
| ## 6 | 406 | 492 | 420 | 445 | 448 | 415 | 367 | 243 |
| ## | X01.2021 | X02.2021 | X03.2021 | X04.2021 | X05.2021 | X06.2021 | X07.2021 | X08.2021 |
| ## 1 | 117 | 93 | 137 | 156 | 154 | 120 | 107 | 152 |
| ## 2 | 155 | 140 | 162 | 204 | 164 | 178 | 187 | 168 |
| ## 3 | 154 | 115 | 166 | 190 | 167 | 190 | 195 | 157 |
| ## 4 | 54 | 33 | 44 | 65 | 54 | 28 | 63 | 92 |
| ## 5 | 330 | 190 | 279 | 300 | 330 | 383 | 374 | 295 |
| ## 6 | 314 | 178 | 286 | 275 | 300 | 357 | 372 | 290 |
| ## | X09.2021 | X10.2021 | X11.2021 | X12.2021 | X01.2022 | X02.2022 | X03.2022 | X04.2022 |
| ## 1 | 128 | 101 | 101 | 108 | 114 | 132 | 112 | 177 |
| ## 2 | 211 | 164 | 173 | 193 | 223 | 171 | 226 | 266 |
| ## 3 | 196 | 180 | 159 | 145 | 192 | 170 | 226 | 230 |
| ## 4 | 55 | 63 | 48 | 77 | 87 | 69 | 86 | 100 |
| ## 5 | 332 | 308 | 294 | 279 | 387 | 395 | 405 | 472 |
| ## 6 | 299 | 273 | 265 | 272 | 367 | 362 | 383 | 461 |
| ## | X05.2022 | X06.2022 | X07.2022 | X08.2022 | X09.2022 | X10.2022 | X11.2022 | X12.2022 |
| ## 1 | 163 | 156 | 166 | 179 | 138 | 174 | 120 | 110 |
| ## 2 | 260 | 267 | 257 | 268 | 259 | 308 | 244 | 250 |
| ## 3 | 259 | 224 | 260 | 172 | 217 | 240 | 147 | 184 |
| ## 4 | 110 | 125 | 131 | 100 | 102 | 119 | 110 | 90 |
| ## 5 | 501 | 418 | 533 | 516 | 502 | 482 | 331 | 374 |
| ## 6 | 488 | 412 | 509 | 496 | 465 | 474 | 325 | 355 |
| ## | X01.2023 | X02.2023 | X03.2023 | X04.2023 | X05.2023 | X06.2023 | X07.2023 | X08.2023 |
| ## 1 | 112 | 142 | 131 | 175 | 145 | 145 | 213 | 191 |
| ## 2 | 255 | 219 | 248 | 242 | 282 | 300 | 260 | 290 |
| ## 3 | 229 | 208 | 294 | 213 | 242 | 405 | 204 | 328 |
| ## 4 | 85 | 73 | 93 | 74 | 101 | 121 | 109 | 71 |
| ## 5 | 433 | 332 | 399 | 570 | 567 | 482 | 519 | 560 |
| ## 6 | 413 | 318 | 364 | 561 | 548 | 445 | 501 | 532 |
| ## | X09.2023 | X10.2023 | X11.2023 | X12.2023 | | | | |
| ## 1 | 213 | 139 | 126 | 145 | | | | |
| ## 2 | 298 | 244 | 261 | 230 | | | | |
| ## 3 | 309 | 248 | 296 | 200 | | | | |
| ## 4 | 108 | 95 | 96 | 62 | | | | |
| ## 5 | 470 | 428 | 435 | 367 | | | | |
| ## 6 | 425 | 418 | 414 | 354 | | | | |

KC Schools Analysis

Has Crime increased or decreased near Schools?

```
head(school_crimes)
```

| ## | Level | SchoolName | | | | | | |
|------|---------------------------|---|----------|----------|----------|-----------|----------|----------|
| ## 1 | Secondary | African-Centered College Preparatory Academy | | | | | | |
| ## 2 | Primary | African-Centered Preparatory Academy Lower Campus | | | | | | |
| ## 3 | Primary | Benjamin Banneker Elementary School | | | | | | |
| ## 4 | Primary | Border Star Montessori School | | | | | | |
| ## 5 | Secondary | Central High School | | | | | | |
| ## 6 | Secondary | Central Middle School | | | | | | |
| ## | Address | City | State | ZipCode | Latitude | Longitude | | |
| ## 1 | 3500 East Meyer Boulevard | Kansas City | MO | 64132 | 39.04205 | -94.53179 | | |
| ## 2 | 6410 Swope Parkway | Kansas City | MO | 64130 | 39.00981 | -94.57273 | | |
| ## 3 | 7050 Askew Avenue | Kansas City | MO | 64132 | 38.99916 | -94.54532 | | |
| ## 4 | 6321 Wornall Road | Kansas City | MO | 64113 | 39.01328 | -94.59303 | | |
| ## 5 | 3221 Indiana Ave | Kansas City | MO | 64128 | 39.06652 | -94.54248 | | |
| ## 6 | 3611 Linwood Boulevard | Kansas City | MO | 64128 | 39.06680 | -94.53974 | | |
| ## | X01.2015 | X02.2015 | X03.2015 | X04.2015 | X05.2015 | X06.2015 | X07.2015 | X08.2015 |
| ## 1 | 297 | 285 | 349 | 328 | 391 | 370 | 367 | 450 |
| ## 2 | 280 | 290 | 277 | 271 | 343 | 344 | 499 | 339 |
| ## 3 | 295 | 270 | 274 | 263 | 343 | 335 | 433 | 312 |
| ## 4 | 89 | 108 | 113 | 90 | 115 | 81 | 134 | 115 |
| ## 5 | 446 | 383 | 507 | 520 | 443 | 561 | 609 | 598 |
| ## 6 | 429 | 364 | 475 | 515 | 419 | 517 | 576 | 592 |
| ## | X09.2015 | X10.2015 | X11.2015 | X12.2015 | X01.2016 | X02.2016 | X03.2016 | X04.2016 |
| ## 1 | 384 | 354 | 320 | 309 | 337 | 376 | 375 | 429 |
| ## 2 | 369 | 336 | 366 | 273 | 365 | 258 | 307 | 296 |
| ## 3 | 295 | 299 | 336 | 293 | 338 | 336 | 298 | 320 |
| ## 4 | 119 | 123 | 142 | 89 | 130 | 76 | 101 | 98 |
| ## 5 | 623 | 469 | 524 | 500 | 527 | 456 | 574 | 503 |
| ## 6 | 588 | 467 | 511 | 481 | 548 | 447 | 559 | 507 |
| ## | X05.2016 | X06.2016 | X07.2016 | X08.2016 | X09.2016 | X10.2016 | X11.2016 | X12.2016 |
| ## 1 | 381 | 328 | 456 | 443 | 450 | 337 | 397 | 245 |
| ## 2 | 407 | 402 | 371 | 434 | 352 | 409 | 363 | 264 |
| ## 3 | 414 | 318 | 402 | 390 | 373 | 348 | 278 | 223 |
| ## 4 | 139 | 118 | 135 | 137 | 132 | 171 | 168 | 136 |
| ## 5 | 506 | 637 | 683 | 697 | 582 | 583 | 455 | 303 |
| ## 6 | 508 | 609 | 669 | 677 | 588 | 583 | 416 | 291 |
| ## | X01.2017 | X02.2017 | X03.2017 | X04.2017 | X05.2017 | X06.2017 | X07.2017 | X08.2017 |
| ## 1 | 181 | 155 | 195 | 163 | 180 | 187 | 231 | 171 |
| ## 2 | 251 | 233 | 245 | 194 | 224 | 296 | 282 | 246 |
| ## 3 | 273 | 242 | 271 | 222 | 220 | 289 | 292 | 197 |
| ## 4 | 107 | 60 | 66 | 85 | 88 | 64 | 75 | 84 |
| ## 5 | 412 | 294 | 439 | 478 | 495 | 514 | 433 | 519 |
| ## 6 | 365 | 232 | 408 | 384 | 424 | 454 | 374 | 466 |
| ## | X09.2017 | X10.2017 | X11.2017 | X12.2017 | X01.2018 | X02.2018 | X03.2018 | X04.2018 |
| ## 1 | 235 | 180 | 169 | 176 | 189 | 103 | 235 | 239 |
| ## 2 | 280 | 223 | 249 | 164 | 221 | 189 | 212 | 152 |
| ## 3 | 262 | 218 | 203 | 160 | 184 | 134 | 211 | 167 |

| | | | | | | | | |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| ## 4 | 100 | 98 | 93 | 60 | 70 | 73 | 86 | 57 |
| ## 5 | 567 | 469 | 395 | 358 | 396 | 468 | 438 | 431 |
| ## 6 | 490 | 403 | 324 | 311 | 313 | 433 | 384 | 400 |
| ## | X05.2018 | X06.2018 | X07.2018 | X08.2018 | X09.2018 | X10.2018 | X11.2018 | X12.2018 |
| ## 1 | 229 | 214 | 220 | 196 | 169 | 218 | 145 | 210 |
| ## 2 | 238 | 221 | 267 | 217 | 205 | 205 | 191 | 185 |
| ## 3 | 253 | 232 | 223 | 202 | 208 | 212 | 237 | 181 |
| ## 4 | 116 | 77 | 89 | 95 | 112 | 68 | 56 | 31 |
| ## 5 | 514 | 412 | 476 | 451 | 441 | 495 | 440 | 316 |
| ## 6 | 454 | 388 | 445 | 405 | 408 | 432 | 389 | 298 |
| ## | X01.2019 | X02.2019 | X03.2019 | X04.2019 | X05.2019 | X06.2019 | X07.2019 | X08.2019 |
| ## 1 | 162 | 133 | 108 | 161 | 149 | 117 | 145 | 134 |
| ## 2 | 171 | 164 | 219 | 245 | 192 | 186 | 263 | 164 |
| ## 3 | 192 | 153 | 173 | 226 | 177 | 152 | 248 | 146 |
| ## 4 | 60 | 38 | 43 | 82 | 52 | 50 | 39 | 54 |
| ## 5 | 381 | 244 | 402 | 455 | 450 | 398 | 441 | 415 |
| ## 6 | 374 | 247 | 387 | 418 | 399 | 352 | 405 | 394 |
| ## | X09.2019 | X10.2019 | X11.2019 | X12.2019 | X01.2020 | X02.2020 | X03.2020 | X04.2020 |
| ## 1 | 147 | 133 | 118 | 104 | 158 | 119 | 125 | 147 |
| ## 2 | 234 | 216 | 152 | 165 | 156 | 174 | 210 | 169 |
| ## 3 | 248 | 191 | 163 | 127 | 171 | 158 | 179 | 179 |
| ## 4 | 79 | 60 | 58 | 60 | 28 | 45 | 58 | 39 |
| ## 5 | 363 | 347 | 314 | 252 | 375 | 345 | 371 | 361 |
| ## 6 | 351 | 300 | 289 | 229 | 371 | 343 | 336 | 346 |
| ## | X05.2020 | X06.2020 | X07.2020 | X08.2020 | X09.2020 | X10.2020 | X11.2020 | X12.2020 |
| ## 1 | 170 | 170 | 159 | 189 | 177 | 140 | 125 | 123 |
| ## 2 | 221 | 256 | 200 | 242 | 167 | 207 | 186 | 184 |
| ## 3 | 217 | 220 | 241 | 247 | 201 | 185 | 171 | 163 |
| ## 4 | 50 | 70 | 53 | 72 | 80 | 73 | 86 | 66 |
| ## 5 | 429 | 525 | 451 | 464 | 477 | 429 | 383 | 263 |
| ## 6 | 406 | 492 | 420 | 445 | 448 | 415 | 367 | 243 |
| ## | X01.2021 | X02.2021 | X03.2021 | X04.2021 | X05.2021 | X06.2021 | X07.2021 | X08.2021 |
| ## 1 | 117 | 93 | 137 | 156 | 154 | 120 | 107 | 152 |
| ## 2 | 155 | 140 | 162 | 204 | 164 | 178 | 187 | 168 |
| ## 3 | 154 | 115 | 166 | 190 | 167 | 190 | 195 | 157 |
| ## 4 | 54 | 33 | 44 | 65 | 54 | 28 | 63 | 92 |
| ## 5 | 330 | 190 | 279 | 300 | 330 | 383 | 374 | 295 |
| ## 6 | 314 | 178 | 286 | 275 | 300 | 357 | 372 | 290 |
| ## | X09.2021 | X10.2021 | X11.2021 | X12.2021 | X01.2022 | X02.2022 | X03.2022 | X04.2022 |
| ## 1 | 128 | 101 | 101 | 108 | 114 | 132 | 112 | 177 |
| ## 2 | 211 | 164 | 173 | 193 | 223 | 171 | 226 | 266 |
| ## 3 | 196 | 180 | 159 | 145 | 192 | 170 | 226 | 230 |
| ## 4 | 55 | 63 | 48 | 77 | 87 | 69 | 86 | 100 |
| ## 5 | 332 | 308 | 294 | 279 | 387 | 395 | 405 | 472 |
| ## 6 | 299 | 273 | 265 | 272 | 367 | 362 | 383 | 461 |
| ## | X05.2022 | X06.2022 | X07.2022 | X08.2022 | X09.2022 | X10.2022 | X11.2022 | X12.2022 |
| ## 1 | 163 | 156 | 166 | 179 | 138 | 174 | 120 | 110 |
| ## 2 | 260 | 267 | 257 | 268 | 259 | 308 | 244 | 250 |
| ## 3 | 259 | 224 | 260 | 172 | 217 | 240 | 147 | 184 |
| ## 4 | 110 | 125 | 131 | 100 | 102 | 119 | 110 | 90 |
| ## 5 | 501 | 418 | 533 | 516 | 502 | 482 | 331 | 374 |
| ## 6 | 488 | 412 | 509 | 496 | 465 | 474 | 325 | 355 |
| ## | X01.2023 | X02.2023 | X03.2023 | X04.2023 | X05.2023 | X06.2023 | X07.2023 | X08.2023 |
| ## 1 | 112 | 142 | 131 | 175 | 145 | 145 | 213 | 191 |

```
## 2      255      219      248      242      282      300      260      290
## 3      229      208      294      213      242      405      204      328
## 4       85       73       93       74      101      121      109       71
## 5      433      332      399      570      567      482      519      560
## 6      413      318      364      561      548      445      501      532
##   X09.2023 X10.2023 X11.2023 X12.2023
## 1       213       139       126       145
## 2       298       244       261       230
## 3       309       248       296       200
## 4       108        95        96        62
## 5       470       428       435       367
## 6       425       418       414       354
```

Changing the orientation of the data so it makes it easier for analysis

```
start_date <- as.Date("2015-01-01")
end_date <- as.Date("2023-12-31")
months <- seq(start_date, end_date, by = "month")

year_month_df <- data.frame(Year = format(months, "%Y"), Month = format(months, "%B"))

# Transpose the dataframe
transposed_df <- t(school_crimes[, -c(1:8)]) # Exclude the first column (school names) before transpos
colnames(transposed_df) <- school_crimes[, 2]
transposed_df <- as.data.frame(transposed_df)
final_df <- cbind(year_month_df, transposed_df)

head(final_df)
```

```
##      Year      Month African-Centered College Preparatory Academy
## X01.2015 2015   January                                297
## X02.2015 2015 February                                285
## X03.2015 2015   March                                  349
## X04.2015 2015   April                                  328
## X05.2015 2015     May                                  391
## X06.2015 2015     June                                  370
##      African-Centered Preparatory Academy Lower Campus
## X01.2015                                280
## X02.2015                                290
## X03.2015                                277
## X04.2015                                271
## X05.2015                                343
## X06.2015                                344
##      Benjamin Banneker Elementary School Border Star Montessori School
## X01.2015                                295                                89
## X02.2015                                270                                108
## X03.2015                                274                                113
## X04.2015                                263                                90
## X05.2015                                343                                115
## X06.2015                                335                                81
##      Central High School Central Middle School East High School
## X01.2015                                446                                429                                331
## X02.2015                                383                                364                                276
```

| | | | | |
|----|--|-----|-----|-----|
| ## | X03.2015 | 507 | 475 | 349 |
| ## | X04.2015 | 520 | 515 | 392 |
| ## | X05.2015 | 443 | 419 | 463 |
| ## | X06.2015 | 561 | 517 | 446 |
| ## | Faxon Elementary School Foreign Language Academy | | | |
| ## | X01.2015 | 496 | 630 | |
| ## | X02.2015 | 424 | 480 | |
| ## | X03.2015 | 580 | 640 | |
| ## | X04.2015 | 540 | 572 | |
| ## | X05.2015 | 614 | 725 | |
| ## | X06.2015 | 618 | 630 | |
| ## | Garfield Elementary School George Melcher Elementary School | | | |
| ## | X01.2015 | 694 | | 167 |
| ## | X02.2015 | 547 | | 171 |
| ## | X03.2015 | 706 | | 200 |
| ## | X04.2015 | 666 | | 207 |
| ## | X05.2015 | 739 | | 268 |
| ## | X06.2015 | 820 | | 214 |
| ## | George Washington Carver Dual Language School | | | |
| ## | X01.2015 | | 295 | |
| ## | X02.2015 | | 285 | |
| ## | X03.2015 | | 344 | |
| ## | X04.2015 | | 328 | |
| ## | X05.2015 | | 377 | |
| ## | X06.2015 | | 368 | |
| ## | Gladstone Elementary School Hale Cook Elementary School | | | |
| ## | X01.2015 | 402 | | 117 |
| ## | X02.2015 | 420 | | 104 |
| ## | X03.2015 | 460 | | 127 |
| ## | X04.2015 | 439 | | 162 |
| ## | X05.2015 | 513 | | 152 |
| ## | X06.2015 | 437 | | 81 |
| ## | Harold Holliday, Sr. Montessori School J.A. Rogers Elementary School | | | |
| ## | X01.2015 | | 112 | 304 |
| ## | X02.2015 | | 103 | 227 |
| ## | X03.2015 | | 146 | 330 |
| ## | X04.2015 | | 149 | 347 |
| ## | X05.2015 | | 161 | 360 |
| ## | X06.2015 | | 160 | 360 |
| ## | James Elementary School John T. Hartman | | | |
| ## | X01.2015 | 319 | 322 | |
| ## | X02.2015 | 323 | 267 | |
| ## | X03.2015 | 325 | 236 | |
| ## | X04.2015 | 314 | 320 | |
| ## | X05.2015 | 296 | 286 | |
| ## | X06.2015 | 333 | 243 | |
| ## | Lincoln College Preparatory Academy | | | |
| ## | X01.2015 | | 425 | |
| ## | X02.2015 | | 264 | |
| ## | X03.2015 | | 418 | |
| ## | X04.2015 | | 346 | |
| ## | X05.2015 | | 408 | |
| ## | X06.2015 | | 483 | |
| ## | Lincoln College Preparatory Academy Middle School | | | |

| | | | |
|----|--|-----|-----|
| ## | X01.2015 | 384 | |
| ## | X02.2015 | 230 | |
| ## | X03.2015 | 403 | |
| ## | X04.2015 | 328 | |
| ## | X05.2015 | 398 | |
| ## | X06.2015 | 475 | |
| ## | Manual Career and Technical Center | | |
| ## | X01.2015 | 786 | |
| ## | X02.2015 | 725 | |
| ## | X03.2015 | 809 | |
| ## | X04.2015 | 753 | |
| ## | X05.2015 | 805 | |
| ## | X06.2015 | 818 | |
| ## | Martin Luther King, Jr. Elementary School Northeast High School | | |
| ## | X01.2015 | 564 | 481 |
| ## | X02.2015 | 366 | 484 |
| ## | X03.2015 | 578 | 540 |
| ## | X04.2015 | 495 | 511 |
| ## | X05.2015 | 593 | 593 |
| ## | X06.2015 | 593 | 587 |
| ## | Northeast Middle School | | |
| ## | X01.2015 | 492 | |
| ## | X02.2015 | 493 | |
| ## | X03.2015 | 529 | |
| ## | X04.2015 | 553 | |
| ## | X05.2015 | 635 | |
| ## | X06.2015 | 601 | |
| ## | Paseo Academy of Fine and Performing Arts Academy | | |
| ## | X01.2015 | 412 | |
| ## | X02.2015 | 224 | |
| ## | X03.2015 | 393 | |
| ## | X04.2015 | 340 | |
| ## | X05.2015 | 416 | |
| ## | X06.2015 | 414 | |
| ## | Phillis Wheatley Elementary School Pitcher Elementary School | | |
| ## | X01.2015 | 510 | 170 |
| ## | X02.2015 | 311 | 115 |
| ## | X03.2015 | 521 | 131 |
| ## | X04.2015 | 430 | 108 |
| ## | X05.2015 | 476 | 138 |
| ## | X06.2015 | 565 | 114 |
| ## | Primitivo Garcia Elementary School | | |
| ## | X01.2015 | 510 | |
| ## | X02.2015 | 413 | |
| ## | X03.2015 | 433 | |
| ## | X04.2015 | 397 | |
| ## | X05.2015 | 463 | |
| ## | X06.2015 | 445 | |
| ## | Richardson Early Learning Community Center Southeast High School | | |
| ## | X01.2015 | 569 | 328 |
| ## | X02.2015 | 506 | 266 |
| ## | X03.2015 | 646 | 271 |
| ## | X04.2015 | 671 | 300 |
| ## | X05.2015 | 606 | 346 |

| | | | |
|----|---|-----|------|
| ## | X06.2015 | 721 | 380 |
| ## | Success Academy at Anderson Success Academy at Knots | | |
| ## | X01.2015 | 737 | 108 |
| ## | X02.2015 | 668 | 100 |
| ## | X03.2015 | 734 | 131 |
| ## | X04.2015 | 693 | 129 |
| ## | X05.2015 | 740 | 151 |
| ## | X06.2015 | 769 | 156 |
| ## | Trailwoods Elementary School Wendell Phillips Elementary School | | |
| ## | X01.2015 | 277 | 476 |
| ## | X02.2015 | 188 | 273 |
| ## | X03.2015 | 281 | 460 |
| ## | X04.2015 | 291 | 381 |
| ## | X05.2015 | 306 | 438 |
| ## | X06.2015 | 371 | 571 |
| ## | Whittier Elementary School Woodland Early Learning Community School | | |
| ## | X01.2015 | 614 | 866 |
| ## | X02.2015 | 495 | 711 |
| ## | X03.2015 | 665 | 863 |
| ## | X04.2015 | 544 | 796 |
| ## | X05.2015 | 735 | 866 |
| ## | X06.2015 | 738 | 1000 |

```
tail(final_df)
```

| | | | |
|----|---|----------------|--|
| ## | Year | Month | African-Centered College Preparatory Academy |
| ## | X07.2023 | 2023 July | 213 |
| ## | X08.2023 | 2023 August | 191 |
| ## | X09.2023 | 2023 September | 213 |
| ## | X10.2023 | 2023 October | 139 |
| ## | X11.2023 | 2023 November | 126 |
| ## | X12.2023 | 2023 December | 145 |
| ## | African-Centered Preparatory Academy Lower Campus | | |
| ## | X07.2023 | | 260 |
| ## | X08.2023 | | 290 |
| ## | X09.2023 | | 298 |
| ## | X10.2023 | | 244 |
| ## | X11.2023 | | 261 |
| ## | X12.2023 | | 230 |
| ## | Benjamin Banneker Elementary School Border Star Montessori School | | |
| ## | X07.2023 | | 204 109 |
| ## | X08.2023 | | 328 71 |
| ## | X09.2023 | | 309 108 |
| ## | X10.2023 | | 248 95 |
| ## | X11.2023 | | 296 96 |
| ## | X12.2023 | | 200 62 |
| ## | Central High School Central Middle School East High School | | |
| ## | X07.2023 | 519 501 | 368 |
| ## | X08.2023 | 560 532 | 370 |
| ## | X09.2023 | 470 425 | 317 |
| ## | X10.2023 | 428 418 | 267 |
| ## | X11.2023 | 435 414 | 343 |
| ## | X12.2023 | 367 354 | 357 |
| ## | Faxon Elementary School Foreign Language Academy | | |

| | | | |
|----|--|-----|-----|
| ## | X07.2023 | 682 | 897 |
| ## | X08.2023 | 702 | 806 |
| ## | X09.2023 | 637 | 835 |
| ## | X10.2023 | 562 | 837 |
| ## | X11.2023 | 576 | 702 |
| ## | X12.2023 | 464 | 600 |
| ## | Garfield Elementary School George Melcher Elementary School | | |
| ## | X07.2023 | 526 | 265 |
| ## | X08.2023 | 500 | 186 |
| ## | X09.2023 | 464 | 160 |
| ## | X10.2023 | 450 | 158 |
| ## | X11.2023 | 417 | 162 |
| ## | X12.2023 | 405 | 167 |
| ## | George Washington Carver Dual Language School | | |
| ## | X07.2023 | 204 | |
| ## | X08.2023 | 184 | |
| ## | X09.2023 | 185 | |
| ## | X10.2023 | 132 | |
| ## | X11.2023 | 114 | |
| ## | X12.2023 | 134 | |
| ## | Gladstone Elementary School Hale Cook Elementary School | | |
| ## | X07.2023 | 407 | 102 |
| ## | X08.2023 | 410 | 120 |
| ## | X09.2023 | 312 | 100 |
| ## | X10.2023 | 304 | 101 |
| ## | X11.2023 | 339 | 96 |
| ## | X12.2023 | 280 | 90 |
| ## | Harold Holliday, Sr. Montessori School J.A. Rogers Elementary School | | |
| ## | X07.2023 | 102 | 274 |
| ## | X08.2023 | 177 | 292 |
| ## | X09.2023 | 162 | 249 |
| ## | X10.2023 | 111 | 193 |
| ## | X11.2023 | 136 | 282 |
| ## | X12.2023 | 112 | 285 |
| ## | James Elementary School John T. Hartman | | |
| ## | X07.2023 | 273 | 275 |
| ## | X08.2023 | 309 | 284 |
| ## | X09.2023 | 238 | 267 |
| ## | X10.2023 | 237 | 224 |
| ## | X11.2023 | 207 | 296 |
| ## | X12.2023 | 208 | 233 |
| ## | Lincoln College Preparatory Academy | | |
| ## | X07.2023 | 468 | |
| ## | X08.2023 | 486 | |
| ## | X09.2023 | 494 | |
| ## | X10.2023 | 373 | |
| ## | X11.2023 | 406 | |
| ## | X12.2023 | 341 | |
| ## | Lincoln College Preparatory Academy Middle School | | |
| ## | X07.2023 | 439 | |
| ## | X08.2023 | 478 | |
| ## | X09.2023 | 448 | |
| ## | X10.2023 | 346 | |
| ## | X11.2023 | 380 | |

| | | | |
|----|--|------|-----|
| ## | X12.2023 | 307 | |
| ## | Manual Career and Technical Center | | |
| ## | X07.2023 | 913 | |
| ## | X08.2023 | 1006 | |
| ## | X09.2023 | 949 | |
| ## | X10.2023 | 835 | |
| ## | X11.2023 | 696 | |
| ## | X12.2023 | 703 | |
| ## | Martin Luther King, Jr. Elementary School Northeast High School | | |
| ## | X07.2023 | 368 | 517 |
| ## | X08.2023 | 339 | 524 |
| ## | X09.2023 | 344 | 411 |
| ## | X10.2023 | 337 | 426 |
| ## | X11.2023 | 278 | 418 |
| ## | X12.2023 | 297 | 364 |
| ## | Northeast Middle School | | |
| ## | X07.2023 | 535 | |
| ## | X08.2023 | 556 | |
| ## | X09.2023 | 427 | |
| ## | X10.2023 | 413 | |
| ## | X11.2023 | 440 | |
| ## | X12.2023 | 396 | |
| ## | Paseo Academy of Fine and Performing Arts Academy | | |
| ## | X07.2023 | 383 | |
| ## | X08.2023 | 322 | |
| ## | X09.2023 | 346 | |
| ## | X10.2023 | 349 | |
| ## | X11.2023 | 278 | |
| ## | X12.2023 | 320 | |
| ## | Phillis Wheatley Elementary School Pitcher Elementary School | | |
| ## | X07.2023 | 433 | 129 |
| ## | X08.2023 | 471 | 90 |
| ## | X09.2023 | 406 | 78 |
| ## | X10.2023 | 325 | 71 |
| ## | X11.2023 | 351 | 75 |
| ## | X12.2023 | 272 | 73 |
| ## | Primitivo Garcia Elementary School | | |
| ## | X07.2023 | 666 | |
| ## | X08.2023 | 692 | |
| ## | X09.2023 | 690 | |
| ## | X10.2023 | 652 | |
| ## | X11.2023 | 505 | |
| ## | X12.2023 | 510 | |
| ## | Richardson Early Learning Community Center Southeast High School | | |
| ## | X07.2023 | 566 | 245 |
| ## | X08.2023 | 610 | 391 |
| ## | X09.2023 | 586 | 295 |
| ## | X10.2023 | 514 | 286 |
| ## | X11.2023 | 512 | 263 |
| ## | X12.2023 | 422 | 218 |
| ## | Success Academy at Anderson Success Academy at Knots | | |
| ## | X07.2023 | 881 | 101 |
| ## | X08.2023 | 968 | 169 |
| ## | X09.2023 | 936 | 148 |

| | | |
|-------------|------------------------------|--|
| ## X10.2023 | 787 | 108 |
| ## X11.2023 | 699 | 134 |
| ## X12.2023 | 660 | 106 |
| ## | Trailwoods Elementary School | Wendell Phillips Elementary School |
| ## X07.2023 | 272 | 442 |
| ## X08.2023 | 273 | 470 |
| ## X09.2023 | 254 | 382 |
| ## X10.2023 | 188 | 329 |
| ## X11.2023 | 264 | 344 |
| ## X12.2023 | 255 | 243 |
| ## | Whittier Elementary School | Woodland Early Learning Community School |
| ## X07.2023 | 563 | 595 |
| ## X08.2023 | 600 | 565 |
| ## X09.2023 | 454 | 544 |
| ## X10.2023 | 442 | 482 |
| ## X11.2023 | 421 | 408 |
| ## X12.2023 | 429 | 437 |

fixing format of columns

```
# Convert Year and Month columns to numeric
final_df$Year <- as.numeric(final_df$Year)
month_mapping <- c("January" = 1, "February" = 2, "March" = 3, "April" = 4,
                  "May" = 5, "June" = 6, "July" = 7, "August" = 8,
                  "September" = 9, "October" = 10, "November" = 11, "December" = 12)
final_df$Month <- month_mapping[final_df$Month]
```

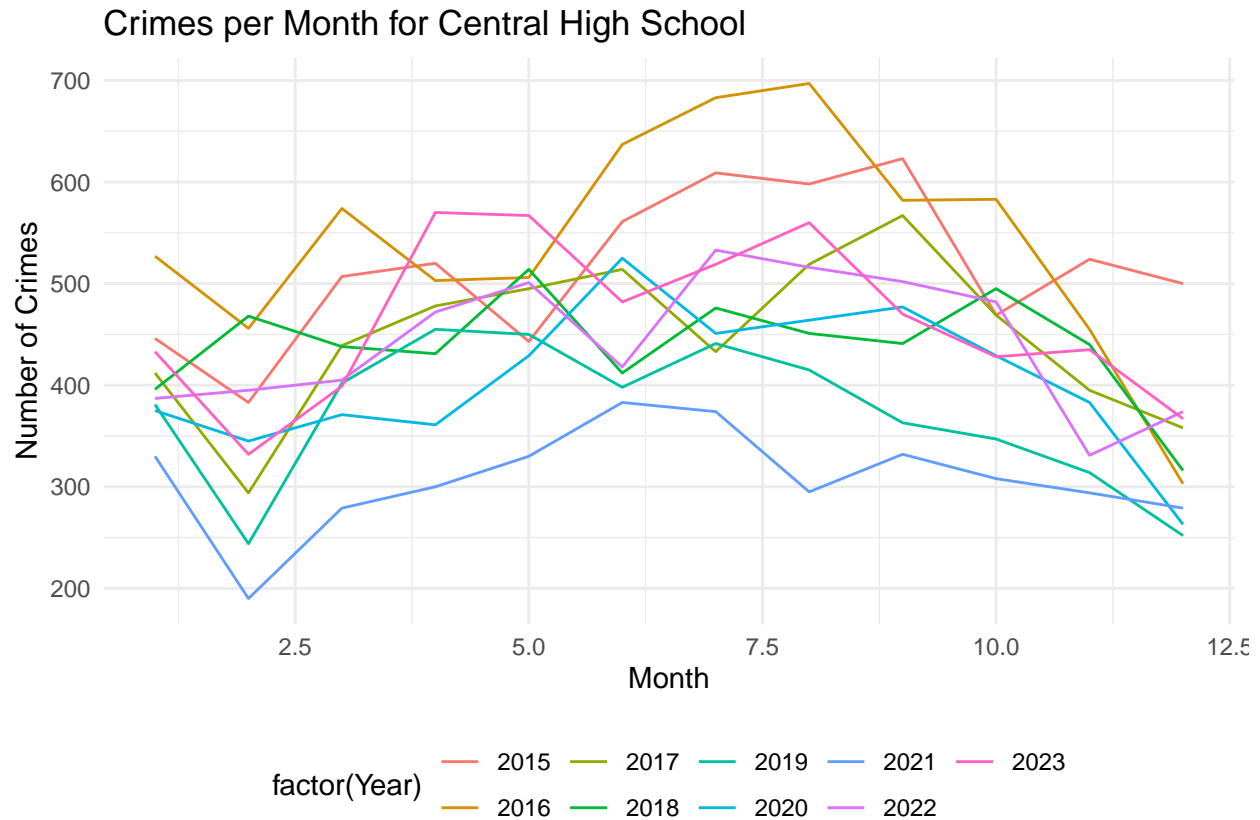
```
# to make the plot look good can only do 1 school at a time
```

```
school_name <- "Central High School" # Replace with the desired school name
```

```
school_df <- final_df[, c("Year", "Month", school_name)]
```

```
# Plot the data for the selected school
```

```
ggplot(school_df, aes(x = Month, y = !!rlang::sym(school_name), color = factor(Year))) +
  geom_line() +
  labs(x = "Month", y = "Number of Crimes", title = paste("Crimes per Month for", school_name)) +
  theme_minimal() +
  theme(legend.position = "bottom")
```



now lets plot average as well as a confidence interval just so you can see if there has been a change

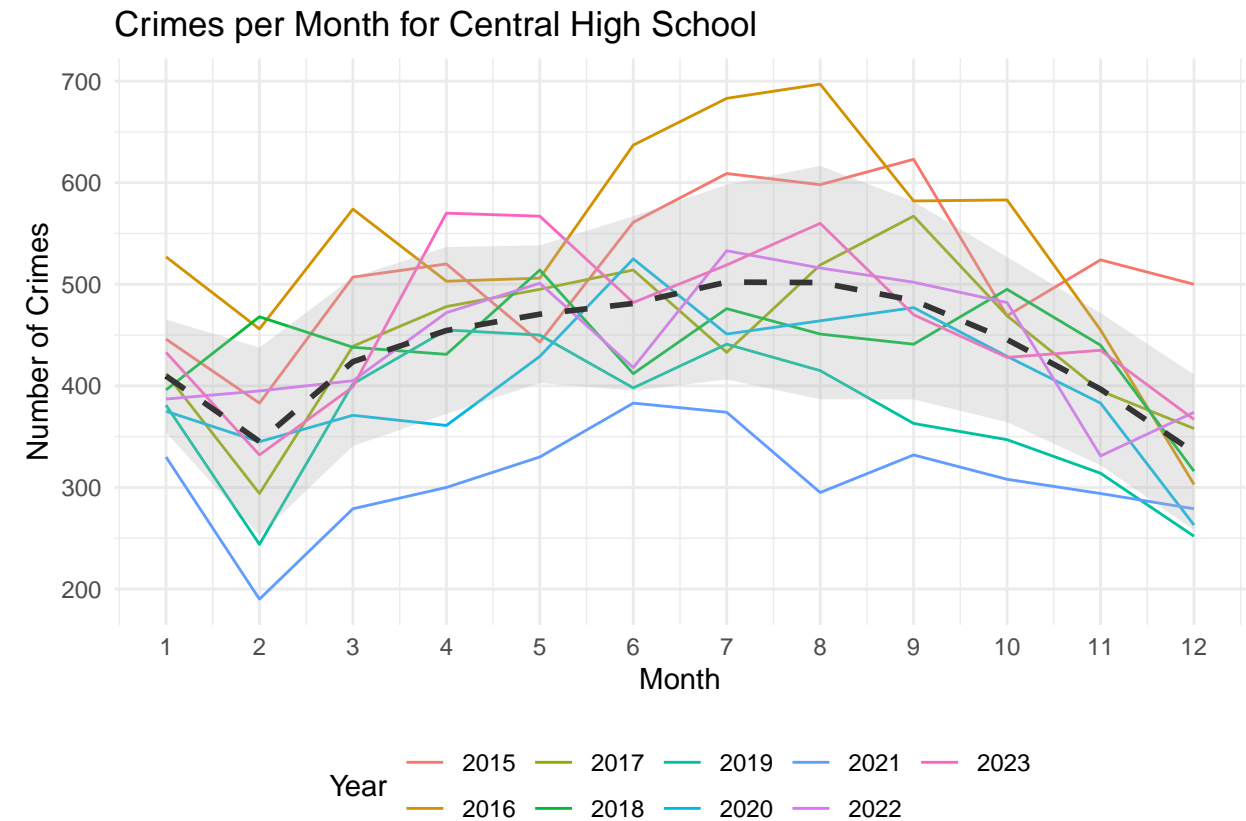
```
# to make the plot look good can only do 1 school at a time
school_name <- "Central High School" # Replace with the desired school name
school_df <- final_df[, c("Year", "Month", school_name)]

# Calculate average and standard deviation across all years
summary_stats <- school_df %>%
  group_by(Month) %>%
  summarise(avg = mean (!!rlang::sym(school_name)),
            sd = sd (!!rlang::sym(school_name)),
            school = school_name)

# Plot
ggplot() +
  geom_line(data = school_df, aes(x = Month, y = !!rlang::sym(school_name), color = factor(Year))) +
  geom_line(data = summary_stats, aes(x = Month, y = avg, group = school), color = "black", linetype = "dashed") +
  geom_ribbon(data = summary_stats, aes(x = Month, ymin = avg - sd, ymax = avg + sd, group = school), fill = "black", alpha = 0.2) +
  labs(x = "Month", y = "Number of Crimes", title = paste("Crimes per Month for", school_name)) +
  theme_minimal() +
  theme(legend.position = "bottom") +
  scale_x_continuous(breaks = 1:12) + # Set x-axis tick marks from 1 to 12
  scale_color_discrete(name = "Year") # Customize legend label
```

```
## Warning: Using 'size' aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use 'linewidth' instead.
```

```
## This warning is displayed once every 8 hours.
## Call 'lifecycle::last_lifecycle_warnings()' to see where this warning was
## generated.
```



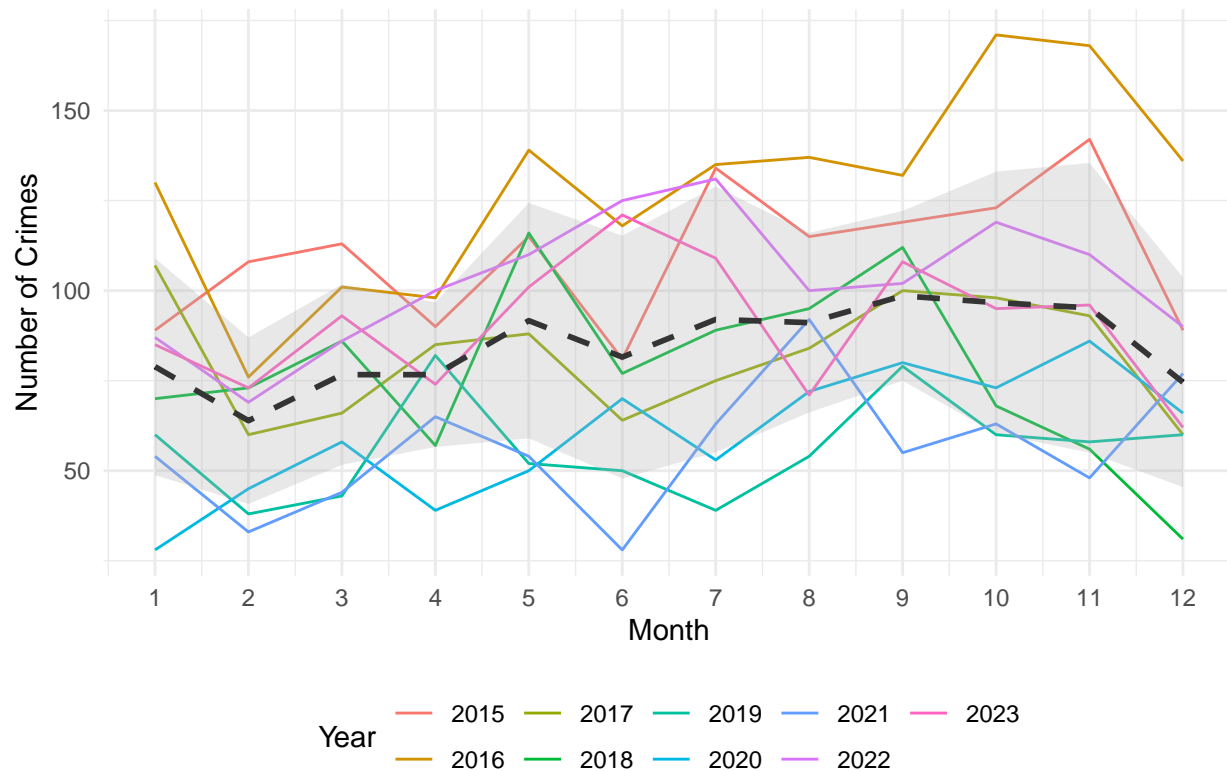
now looking at two other schools for comparison

```
# to make the plot look good can only do 1 school at a time
school_name <- "Border Star Montessori School" # Replace with the desired school name
school_df <- final_df[, c("Year", "Month", school_name)]

# Calculate average and standard deviation across all years
summary_stats <- school_df %>%
  group_by(Month) %>%
  summarise(avg = mean(!rlang::sym(school_name)),
            sd = sd(!rlang::sym(school_name)),
            school = school_name)

# Plot
ggplot() +
  geom_line(data = school_df, aes(x = Month, y = !rlang::sym(school_name), color = factor(Year))) +
  geom_line(data = summary_stats, aes(x = Month, y = avg, group = school), color = "black", linetype = "dashed") +
  geom_ribbon(data = summary_stats, aes(x = Month, ymin = avg - sd, ymax = avg + sd, group = school), fill = "grey", alpha = 0.5) +
  labs(x = "Month", y = "Number of Crimes", title = paste("Crimes per Month for", school_name)) +
  theme_minimal() +
  theme(legend.position = "bottom") +
  scale_x_continuous(breaks = 1:12) + # Set x-axis tick marks from 1 to 12
  scale_color_discrete(name = "Year") # Customize legend label
```

Crimes per Month for Border Star Montessori School

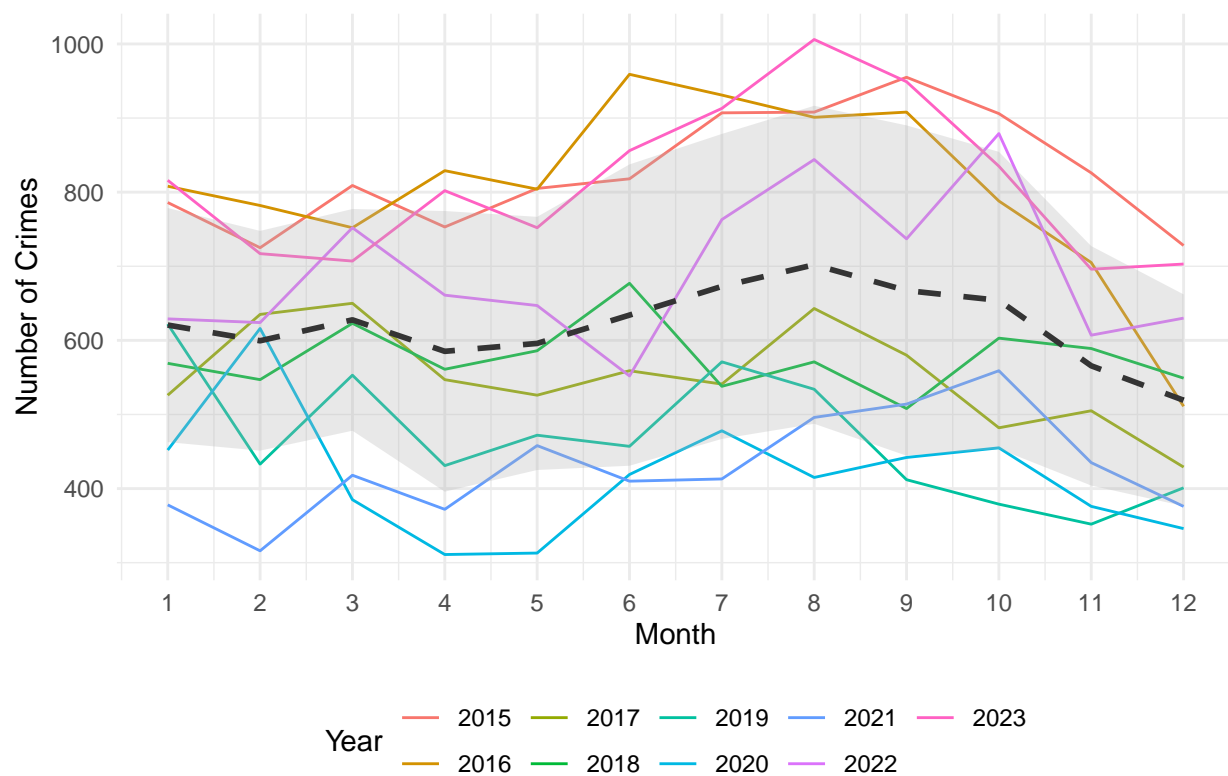


```
# to make the plot look good can only do 1 school at a time
school_name <- "Manual Career and Technical Center" # Replace with the desired school name
school_df <- final_df[, c("Year", "Month", school_name)]

# Calculate average and standard deviation across all years
summary_stats <- school_df %>%
  group_by(Month) %>%
  summarise(avg = mean(!rlang::sym(school_name)),
            sd = sd(!rlang::sym(school_name)),
            school = school_name)

# Plot
ggplot() +
  geom_line(data = school_df, aes(x = Month, y = !rlang::sym(school_name), color = factor(Year))) +
  geom_line(data = summary_stats, aes(x = Month, y = avg, group = school), color = "black", linetype = "dashed") +
  geom_ribbon(data = summary_stats, aes(x = Month, ymin = avg - sd, ymax = avg + sd, group = school), fill = "grey", alpha = 0.5) +
  labs(x = "Month", y = "Number of Crimes", title = paste("Crimes per Month for", school_name)) +
  theme_minimal() +
  theme(legend.position = "bottom") +
  scale_x_continuous(breaks = 1:12) + # Set x-axis tick marks from 1 to 12
  scale_color_discrete(name = "Year") # Customize legend label
```


Crimes per Month for Manual Career and Technical Center



Total

Which Schools Have the Most Crime Near them

```
# to store the results
top_schools <- data.frame()

for (year in unique(final_df$Year)) {
  # Filter data for the current year
  year_data <- filter(final_df, Year == year)

  # Sum the crimes for each school
  year_sum <- year_data %>%
    summarise(across(3:38, sum)) %>%
    melt(id.vars = NULL, variable.name = "School", value.name = "Total_Crimes") %>%
    arrange(desc(Total_Crimes))

  # Select the top 3 schools
  top_3 <- year_sum[1:3, ]
  top_3$Year <- year

  top_schools <- bind_rows(top_schools, top_3)
}
```

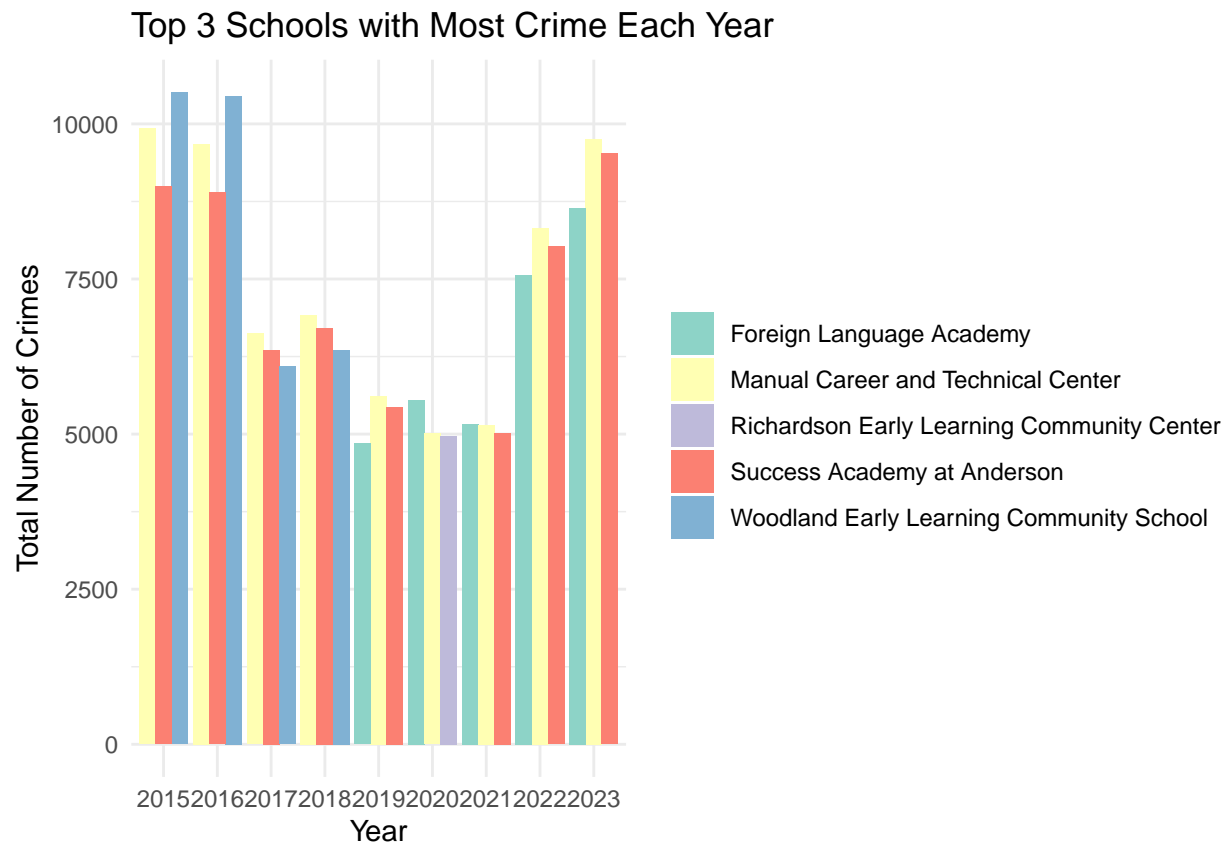
```
}
```

```
print(top_schools)
```

```
##                               School Total_Crimes Year
## 1   Woodland Early Learning Community School      10509 2015
## 2       Manual Career and Technical Center         9926 2015
## 3       Success Academy at Anderson              8994 2015
## 4   Woodland Early Learning Community School      10452 2016
## 5       Manual Career and Technical Center         9678 2016
## 6       Success Academy at Anderson              8895 2016
## 7       Manual Career and Technical Center         6623 2017
## 8       Success Academy at Anderson              6352 2017
## 9   Woodland Early Learning Community School      6093 2017
## 10      Manual Career and Technical Center         6921 2018
## 11      Success Academy at Anderson              6710 2018
## 12   Woodland Early Learning Community School      6353 2018
## 13      Manual Career and Technical Center         5617 2019
## 14      Success Academy at Anderson              5441 2019
## 15      Foreign Language Academy                 4850 2019
## 16      Foreign Language Academy                 5551 2020
## 17      Manual Career and Technical Center         5008 2020
## 18 Richardson Early Learning Community Center      4972 2020
## 19      Foreign Language Academy                 5163 2021
## 20      Manual Career and Technical Center         5145 2021
## 21      Success Academy at Anderson              5021 2021
## 22      Manual Career and Technical Center         8325 2022
## 23      Success Academy at Anderson              8023 2022
## 24      Foreign Language Academy                 7569 2022
## 25      Manual Career and Technical Center         9752 2023
## 26      Success Academy at Anderson              9522 2023
## 27      Foreign Language Academy                 8643 2023
```

Lets now visualize this

```
ggplot(top_schools, aes(x = as.factor(Year), y = Total_Crimes, fill = School)) +
  geom_bar(stat = "identity", position = position_dodge()) +
  labs(x = "Year", y = "Total Number of Crimes", title = "Top 3 Schools with Most Crime Each Year") +
  scale_fill_brewer(palette = "Set3") +
  theme_minimal() +
  theme(legend.title = element_blank())
```



This is very useful information

Which Schools Have the Least Crime Near them

```
# to store the results
bot_schools <- data.frame()

for (year in unique(final_df$Year)) {
  # Filter data for the current year

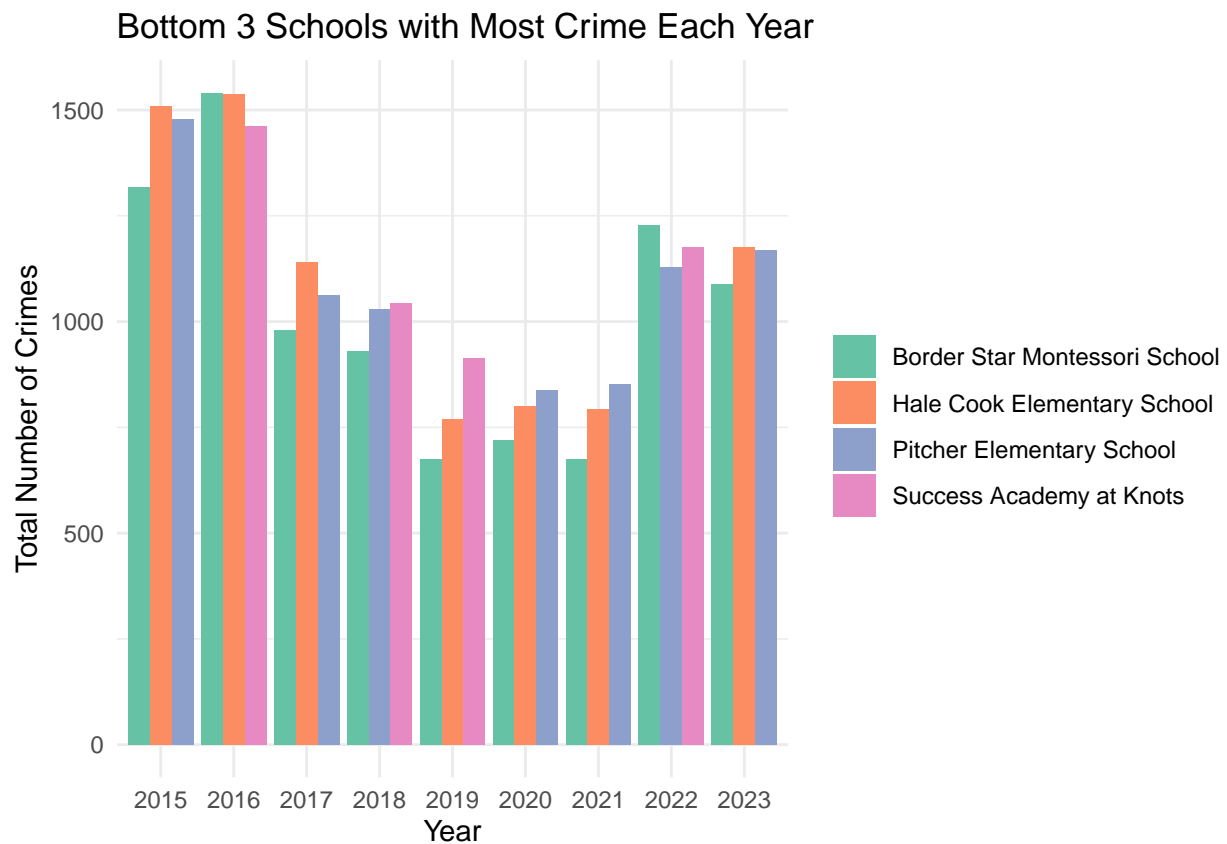
  year_data <- filter(final_df, final_df$Year == year)
  # Sum the crimes for each school
  year_sum <- year_data %>%
    summarise(across(3:38, sum)) %>%
    melt(id.vars = NULL, variable.name = "School", value.name = "Total_Crimes") %>%
    arrange(Total_Crimes)

  # Select the bottom 3 schools
  bot_3 <- year_sum[1:3, ]
  bot_3$Year <- year

  bot_schools <- bind_rows(bot_schools, bot_3)
}
```

Lets now visualize this

```
ggplot(bot_schools, aes(x = as.factor(Year), y = Total_Crimes, fill = School)) +  
  geom_bar(stat = "identity", position = position_dodge()) +  
  labs(x = "Year", y = "Total Number of Crimes", title = "Bottom 3 Schools with Most Crime Each Year") +  
  scale_fill_brewer(palette = "Set2") +  
  theme_minimal() +  
  theme(legend.title = element_blank())
```



Average

Which Schools Have the Most Crime Near them

```
# to store the results  
top_schools <- data.frame()  
  
for (year in unique(final_df$Year)) {  
  # Filter data for the current year  
  year_data <- filter(final_df, Year == year)  
  
  # Sum the crimes for each school  
  year_sum <- year_data %>%
```

```

summarise(across(3:38, mean)) %>%
melt(id.vars = NULL, variable.name = "School", value.name = "Total_Crimes") %>%
arrange(desc(Total_Crimes))

# Select the top 3 schools
top_3 <- year_sum[1:3, ]
top_3$Year <- year

top_schools <- bind_rows(top_schools, top_3)
}

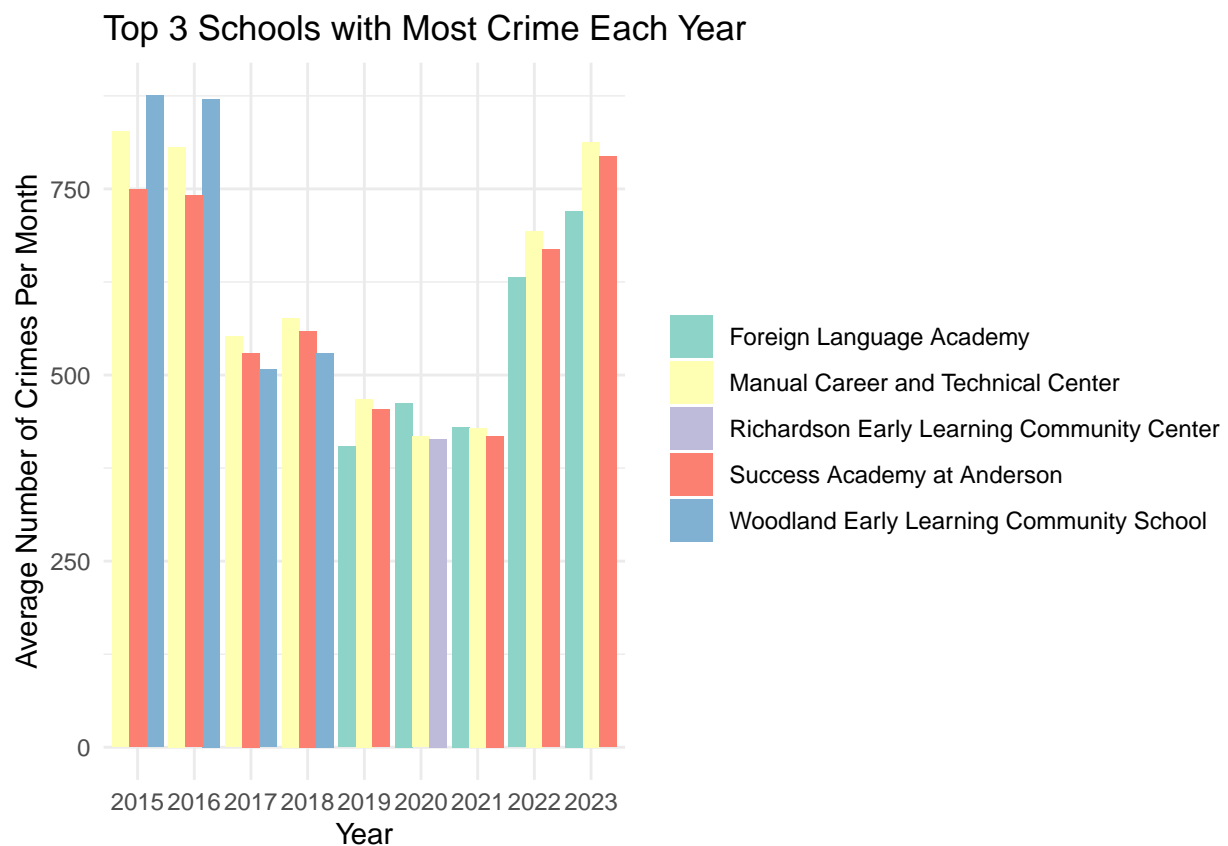
```

Lets now visualize this

```

ggplot(top_schools, aes(x = as.factor(Year), y = Total_Crimes, fill = School)) +
  geom_bar(stat = "identity", position = position_dodge()) +
  labs(x = "Year", y = "Average Number of Crimes Per Month", title = "Top 3 Schools with Most Crime Each Year") +
  scale_fill_brewer(palette = "Set3") +
  theme_minimal() +
  theme(legend.title = element_blank())

```



This is very useful information

Which Schools Have the Least Crime Near them

```
# to store the results
bot_schools <- data.frame()

for (year in unique(final_df$Year)) {
  # Filter data for the current year

  year_data <- filter(final_df, final_df$Year == year)
  # Sum the crimes for each school
  year_sum <- year_data %>%
    summarise(across(3:38, mean)) %>%
    melt(id.vars = NULL, variable.name = "School", value.name = "Total_Crimes") %>%
    arrange(Total_Crimes)

  # Select the bottom 3 schools
  bot_3 <- year_sum[1:3, ]
  bot_3$Year <- year

  bot_schools <- bind_rows(bot_schools, bot_3)
}
```

Lets now visualize this

```
ggplot(bot_schools, aes(x = as.factor(Year), y = Total_Crimes, fill = School)) +
  geom_bar(stat = "identity", position = position_dodge()) +
  labs(x = "Year", y = "Average Number of Crimes Per Month", title = "Bottom 3 Schools with Most Crime") +
  scale_fill_brewer(palette = "Set2") +
  theme_minimal() +
  theme(legend.title = element_blank())
```

Bottom 3 Schools with Most Crime Each Year

