First Look

Elliot Pickens

October 10, 2018

Load some libraries

- You may need to install some of the libraries below. To install package `tidyverse`, for example, run `install.packages("tidyverse")` in the console

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------------------------------

## v ggplot2 3.0.0     v purrr   0.2.5
## v tibble  1.4.2     v dplyr   0.7.6
## v tidyr   0.8.1     v stringr 1.3.1
## v readr   1.1.1     v forcats 0.3.0

## -- Conflicts -----------------------------------------------------------------------
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(tidyselect)
library(tibble)
library(tidyr)
library(dplyr)
library(ggformula)
```

```
## Loading required package: ggstance

##
## Attaching package: 'ggstance'

## The following objects are masked from 'package:ggplot2':
##
##     geom_errorbarh, GeomErrorbarh

##
## New to ggformula?  Try the tutorials:
##   learnr::run_tutorial("introduction", package = "ggformula")
##   learnr::run_tutorial("refining", package = "ggformula")
```

```
library(car)
```

```
## Loading required package: carData

##
## Attaching package: 'car'

## The following object is masked from 'package:dplyr':
##
##     recode

## The following object is masked from 'package:purrr':
##
##     some
```

```
library(gridExtra)
```

```
##
## Attaching package: 'gridExtra'

## The following object is masked from 'package:dplyr':
##
##     combine
```

```
library(broom)
library(ggthemes)
library(MASS)
```

```
##
## Attaching package: 'MASS'

## The following object is masked from 'package:dplyr':
##
##     select
```

```
library(leaps)
library(GGally)
```

```
##
## Attaching package: 'GGally'

## The following object is masked from 'package:dplyr':
##
##     nasa
```

```
library(aod)
library(readr)
library(readxl)
library(stringr)
library(forecast)
library(tseries)
library(tabulizer)
#'httr', 'rvest', 'xml2'
```

Load some data

```
registration <- read_xlsx("data/minnesota-voter-registration-by-county-since-2000.xlsx", skip = 1)
elections <- read_xlsx("data/minnesota-election-statistics-1950-to-2016.xlsx", skip = 2, col_names = c(
#dists <- read_csv("data/Minnesota_District_edit.csv")
dists <- read_csv("data/dists_t.csv", skip = 1)
```

```
## Warning: Duplicated column names deduplicated: 'Total population' => 'Total
## population_1' [20], 'Total population' => 'Total population_2' [29], 'Total
## population' => 'Total population_3' [36], 'Total population' => 'Total
## population_4' [43], 'With a disability' => 'With a disability_1' [76],
## 'With a disability' => 'With a disability_2' [78], '65 years and
## over' => '65 years and over_1' [79], 'With a disability' => 'With a
## disability_3' [80], 'Different state' => 'Different state_1' [87],
## 'Civilian labor force' => 'Civilian labor force_1' [96], 'Civilian
## employed population 16 years and over' => 'Civilian employed population
## 16 years and over_1' [112], 'Civilian employed population 16 years
## and over' => 'Civilian employed population 16 years and over_2' [126],
```

```
## 'Occupied housing units' => 'Occupied housing units_1' [136], 'Occupied
## housing units' => 'Occupied housing units_2' [141], 'Owner-occupied units'
## => 'Owner-occupied units_1' [158], 'Housing units with a mortgage' =>
## 'Housing units with a mortgage_1' [161], 'Median (dollars)' => 'Median
## (dollars)_1' [169], 'Housing units without a mortgage' => 'Housing
## units without a mortgage_1' [170], 'Median (dollars)' => 'Median
## (dollars)_2' [177], 'Less than $500' => 'Less than $500_1' [179], '$500
## to $999' => '$500 to $999_1' [180], '$1,000 to $1,499' => '$1,000 to
## $1,499_1' [181], '$1,500 to $1,999' => '$1,500 to $1,999_1' [182],
## '$2,000 to $2,499' => '$2,000 to $2,499_1' [183], '$2,500 to $2,999' =>
## '$2,500 to $2,999_1' [184], '$3,000 or more' => '$3,000 or more_1' [185],
## 'Median (dollars)' => 'Median (dollars)_3' [186], '$100,000 to $149,999'
## => '$100,000 to $149,999_1' [196], 'No health insurance coverage' =>
## 'No health insurance coverage_1' [207], 'With related children of the
## householder under 18 years' => 'With related children of the householder
## under 18 years_1' [212], 'With related children of the householder
## under 5 years only' => 'With related children of the householder
## under 5 years only_1' [213], 'With related children of the householder
## under 18 years' => 'With related children of the householder under
## 18 years_2' [215], 'With related children of the householder under 5
## years only' => 'With related children of the householder under 5 years
## only_2' [216], 'Under 18 years' => 'Under 18 years_1' [218], '18 years
## and over' => '18 years and over_1' [222], '65 years and over' => '65
## years and over_2' [223], 'Construction' => 'Construction_1' [246],
## 'Manufacturing' => 'Manufacturing_1' [247], 'Wholesale trade' =>
## 'Wholesale trade_1' [248], 'Retail trade' => 'Retail trade_1' [249],
## 'Information' => 'Information_1' [251], 'Total for all sectors' => 'Total
## for all sectors_1' [263], 'Agriculture, forestry, fishing and hunting' =>
## 'Agriculture, forestry, fishing and hunting_1' [264], 'Mining, quarrying,
## and oil and gas extraction' => 'Mining, quarrying, and oil and gas
## extraction_1' [265], 'Utilities' => 'Utilities_1' [266], 'Construction'
## => 'Construction_2' [267], 'Manufacturing' => 'Manufacturing_2' [268],
## 'Wholesale trade' => 'Wholesale trade_2' [269], 'Retail trade' => 'Retail
## trade_2' [270], 'Transportation and warehousing' => 'Transportation and
## warehousing_1' [271], 'Information' => 'Information_2' [272], 'Finance and
## insurance' => 'Finance and insurance_1' [273], 'Real estate and rental and
## leasing' => 'Real estate and rental and leasing_1' [274], 'Professional,
## scientific, and technical services' => 'Professional, scientific, and
## technical services_1' [275], 'Management of companies and enterprises'
## => 'Management of companies and enterprises_1' [276], 'Administrative and
## support and waste management and remediation services' => 'Administrative
## and support and waste management and remediation services_1' [277],
## 'Educational services' => 'Educational services_1' [278], 'Health care
## and social assistance' => 'Health care and social assistance_1' [279],
## 'Arts, entertainment, and recreation' => 'Arts, entertainment, and
## recreation_1' [280], 'Accommodation and food services' => 'Accommodation
## and food services_1' [281], 'Other services (except public administration)'
## => 'Other services (except public administration)_1' [282], 'Industries not
## classified' => 'Industries not classified_1' [283], 'Total for all sectors'
## => 'Total for all sectors_2' [284], 'Agriculture, forestry, fishing and
## hunting' => 'Agriculture, forestry, fishing and hunting_2' [285], 'Mining,
## quarrying, and oil and gas extraction' => 'Mining, quarrying, and oil and
## gas extraction_2' [286], 'Utilities' => 'Utilities_2' [287], 'Construction'
## => 'Construction_3' [288], 'Manufacturing' => 'Manufacturing_3' [289],
```

```
## 'Wholesale trade' => 'Wholesale trade_3' [290], 'Retail trade' => 'Retail
## trade_3' [291], 'Transportation and warehousing' => 'Transportation and
## warehousing_2' [292], 'Information' => 'Information_3' [293], 'Finance and
## insurance' => 'Finance and insurance_2' [294], 'Real estate and rental and
## leasing' => 'Real estate and rental and leasing_2' [295], 'Professional,
## scientific, and technical services' => 'Professional, scientific, and
## technical services_2' [296], 'Management of companies and enterprises'
## => 'Management of companies and enterprises_2' [297], 'Administrative and
## support and waste management and remediation services' => 'Administrative
## and support and waste management and remediation services_2' [298],
## 'Educational services' => 'Educational services_2' [299], 'Health care
## and social assistance' => 'Health care and social assistance_2' [300],
## 'Arts, entertainment, and recreation' => 'Arts, entertainment, and
## recreation_2' [301], 'Accommodation and food services' => 'Accommodation
## and food services_2' [302], 'Other services (except public administration)'
## => 'Other services (except public administration)_2' [303], 'Industries not
## classified' => 'Industries not classified_2' [304]

## Parsed with column specification:
## cols(
##   .default = col_integer(),
##   `Median age (years)` = col_double(),
##   `Unemployment Rate` = col_double(),
##   `Mean travel time to work (minutes)` = col_double(),
##   `Homeowner vacancy rate` = col_double(),
##   `Rental vacancy rate` = col_double(),
##   `Average household size of owner-occupied unit` = col_double(),
##   `Average household size of renter-occupied unit` = col_double(),
##   `All families` = col_double(),
##   `With related children of the householder under 18 years` = col_double(),
##   `With related children of the householder under 5 years only` = col_double(),
##   `Married couple families` = col_double(),
##   `With related children of the householder under 18 years_1` = col_double(),
##   `With related children of the householder under 5 years only_1` = col_double(),
##   `Families with female householder, no husband present` = col_double(),
##   `With related children of the householder under 18 years_2` = col_double(),
##   `With related children of the householder under 5 years only_2` = col_double(),
##   `All people` = col_double(),
##   `Under 18 years_1` = col_double(),
##   `Related children of the householder under 18 years` = col_double(),
##   `Related children of the householder under 5 years` = col_double()
##   # ... with 13 more columns
## )

## See spec(...) for full column specifications.
demo15 <- read_csv("data/ACS_5YR/ACS_15_5YR_S0501/ACS_15_5YR_S0501_with_ann.csv", skip = 0)

## Parsed with column specification:
## cols(
##   .default = col_character()
## )
## See spec(...) for full column specifications.
demo17 <- read_xls("data/ACS_1YR/ACS_17_1YR_S0601(1).xls", skip = 0)
```

Creating 2014 Representative Vote By District

```r
titles = c("republican", "democrat", "other")
first = c(103536, 122851, 308)
second = c(137778, 95565, 12319)
third = c(167515, 101846, 224)
fourth = c(79492, 147857, 14059)
fifth = c(56577, 167079, 12354)
sixth = c(133328, 90926, 12592)
seventh = c(109955, 130546, 334)
eighth = c(125358, 129090, 11450) #other is green party vote, for 8th district
rep_2014 = rbind.data.frame(first, second, third, fourth, fifth, sixth, seventh, eighth)
colnames(rep_2014) = titles
rep_2014 = mutate(rep_2014, total = republican + democrat + other) %>%
   mutate(repubRatio = republican/total)
```

Creating 2012 Representative Vote By District

```r
first2012 = c(142164, 193211, 505)
second2012 = c(193587, 164338, 521)
third2012 = c(222335, 159937, 433)
fourth2012 = c(109659, 216685, 21682)
fifth2012 = c(88753, 262102, 1114)
sixth2012 = c(179240, 174944, 969)
seventh2012 = c(114151, 197791, 15638)
eighth2012 = c(160520, 191976, 1167)
rep_2012 = rbind.data.frame(first2012, second2012, third2012, fourth2012, fifth2012, sixth2012, seventh
colnames(rep_2012) = titles
rep_2012 = mutate(rep_2012, total = republican + democrat + other) %>%
  mutate(repubRatio = republican/total)
```

Creating 2010 Representative Vote By District

```r
first2010 = c(109242, 122365, 16398)
second2010 = c(181341, 104809, 303)
third2010 = c(161177, 100240, 12675)
fourth2010 = c(80141, 136746, 14539)
fifth2010 = c(55222, 154833, 18691)
sixth2010 = c(159476, 120846, 23369)
seventh2010 = c(90652, 133096, 17349)
eighth2010 = c(133490, 129091, 14500)
rep_2010 = rbind.data.frame(first2010, second2010, third2010, fourth2010, fifth2010, sixth2010, seventh
colnames(rep_2010) = titles
rep_2010 = mutate(rep_2010, total = republican + democrat + other) %>%
   mutate(repubRatio = republican/total)
```

2016 County Data

```
county_2016 = extract_tables("data/electionresults_2016.pdf", pages = 1)
county_2016 = as.data.frame(county_2016[[2]], stringsAsFactors = FALSE)
colnames(county_2016) = c("County", "VotersRegAM", "RegElecDay", "Sigs", "RegMilOver", "FedAbsentee", "V
```

Creating a District Column

```
county_2016 = slice(county_2016, 1:87) %>%
  mutate(District = case_when(
    County == "Blue Earth"|County == "Brown"|County == "Dodge"|County == "Faribault"|County == "Fillmor
    County == "Dakota"|County == "Goodhue"|County == "Scott"|County == "Wabasha" ~ 2,
    County == "Hennepin"|County == "Carver" ~ 3,
    County == "Washington" ~ 4,
    County == "Ramsey" ~ 5,
    County == "Benton"|County == "Sherburne"|County == "Wright"|County == "Anoka"|County == "Stearns" ~
    County == "Becker"|County == "Big Stone"|County == "Chippewa"|County == "Clay"|County == "Clearwater
    County == "Aitkin"|County == "Carlton"|County == "Cass"|County == "Chisago"|County == "Cook"|County

county_2016$Voters = lapply(county_2016$Voters, function(x) gsub(",", "", x)) %>%
  as.numeric()
```

Summarizing voter county by district

```
voters_2016 = county_2016 %>%
  group_by(District) %>%
  summarize(Votes = sum(Voters)) %>%
  dplyr::select(Votes)
```

Loading and Cleaning General Results Data for 2016: By Congressional District

```
genResults2016_congDist = read_excel("data/2016genresults.xlsx") %>%
  dplyr::select(CONGDIST, TOTVOTING) %>%
  group_by(CONGDIST) %>%
  summarise(votes = sum(TOTVOTING)) %>%
  slice(-9)
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1189 / R1189C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1190 / R1190C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1191 / R1191C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1192 / R1192C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1193 / R1193C15: got '5'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1194 / R1194C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1195 / R1195C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1196 / R1196C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1197 / R1197C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1198 / R1198C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1199 / R1199C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1200 / R1200C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1201 / R1201C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1202 / R1202C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1203 / R1203C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1204 / R1204C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1205 / R1205C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1206 / R1206C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1207 / R1207C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1208 / R1208C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1209 / R1209C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1210 / R1210C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1211 / R1211C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1212 / R1212C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1213 / R1213C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1214 / R1214C15: got '5'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1215 / R1215C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1216 / R1216C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1217 / R1217C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1218 / R1218C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1219 / R1219C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1220 / R1220C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1221 / R1221C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1222 / R1222C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1223 / R1223C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1224 / R1224C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1225 / R1225C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1226 / R1226C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1227 / R1227C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1228 / R1228C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1229 / R1229C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1230 / R1230C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1231 / R1231C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1232 / R1232C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1233 / R1233C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1234 / R1234C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1235 / R1235C15: got '2'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1236 / R1236C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1237 / R1237C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1238 / R1238C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1239 / R1239C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1240 / R1240C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1241 / R1241C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1242 / R1242C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1243 / R1243C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1244 / R1244C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1245 / R1245C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1246 / R1246C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1247 / R1247C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1248 / R1248C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1249 / R1249C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1250 / R1250C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1251 / R1251C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1252 / R1252C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1253 / R1253C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1254 / R1254C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1255 / R1255C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1256 / R1256C15: got '5'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1257 / R1257C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1258 / R1258C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1259 / R1259C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1260 / R1260C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1261 / R1261C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1262 / R1262C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1263 / R1263C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1264 / R1264C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1265 / R1265C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1266 / R1266C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1267 / R1267C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1268 / R1268C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1269 / R1269C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1270 / R1270C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1271 / R1271C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1272 / R1272C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1273 / R1273C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1274 / R1274C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1275 / R1275C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1276 / R1276C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1277 / R1277C15: got '5'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1278 / R1278C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1279 / R1279C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1280 / R1280C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1281 / R1281C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1282 / R1282C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1283 / R1283C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1284 / R1284C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1285 / R1285C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1286 / R1286C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1287 / R1287C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1288 / R1288C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1289 / R1289C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1290 / R1290C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1291 / R1291C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1292 / R1292C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1293 / R1293C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1294 / R1294C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1295 / R1295C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1296 / R1296C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1297 / R1297C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1298 / R1298C15: got '4'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1299 / R1299C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1300 / R1300C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1301 / R1301C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1302 / R1302C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1303 / R1303C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1304 / R1304C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1305 / R1305C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1306 / R1306C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1307 / R1307C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1308 / R1308C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1309 / R1309C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1310 / R1310C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1311 / R1311C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1312 / R1312C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1313 / R1313C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1314 / R1314C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1315 / R1315C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1316 / R1316C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1317 / R1317C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1318 / R1318C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1319 / R1319C15: got '3'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1320 / R1320C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1321 / R1321C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1322 / R1322C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1323 / R1323C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1324 / R1324C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1325 / R1325C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1326 / R1326C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1327 / R1327C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1328 / R1328C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1329 / R1329C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1330 / R1330C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1331 / R1331C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1332 / R1332C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1333 / R1333C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1334 / R1334C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1335 / R1335C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1336 / R1336C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1337 / R1337C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1338 / R1338C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1339 / R1339C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1340 / R1340C15: got '2'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1341 / R1341C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1342 / R1342C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1343 / R1343C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1344 / R1344C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1345 / R1345C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1346 / R1346C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1347 / R1347C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1348 / R1348C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1349 / R1349C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1350 / R1350C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1351 / R1351C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1352 / R1352C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1353 / R1353C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1354 / R1354C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1355 / R1355C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1356 / R1356C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1357 / R1357C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1358 / R1358C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1359 / R1359C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1360 / R1360C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1361 / R1361C15: got '2'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1362 / R1362C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1363 / R1363C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1364 / R1364C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1365 / R1365C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1366 / R1366C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1367 / R1367C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1368 / R1368C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1369 / R1369C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1370 / R1370C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1371 / R1371C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1372 / R1372C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1373 / R1373C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1374 / R1374C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1375 / R1375C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1376 / R1376C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1377 / R1377C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1378 / R1378C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1379 / R1379C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1380 / R1380C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1381 / R1381C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1382 / R1382C15: got '3'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01383 / R1383C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01384 / R1384C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01385 / R1385C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01386 / R1386C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01387 / R1387C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01388 / R1388C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01389 / R1389C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01390 / R1390C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01391 / R1391C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01392 / R1392C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01393 / R1393C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01394 / R1394C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01395 / R1395C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01396 / R1396C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01397 / R1397C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01398 / R1398C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01399 / R1399C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01400 / R1400C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01401 / R1401C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01402 / R1402C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in 01403 / R1403C15: got '2'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1404 / R1404C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1405 / R1405C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1406 / R1406C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1407 / R1407C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1408 / R1408C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1409 / R1409C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1410 / R1410C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1411 / R1411C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1412 / R1412C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1413 / R1413C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1414 / R1414C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1415 / R1415C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1416 / R1416C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1417 / R1417C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1418 / R1418C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1419 / R1419C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1420 / R1420C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1421 / R1421C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1422 / R1422C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1423 / R1423C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1424 / R1424C15: got '4'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1425 / R1425C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1426 / R1426C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1427 / R1427C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1428 / R1428C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1429 / R1429C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1430 / R1430C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1431 / R1431C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1432 / R1432C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1433 / R1433C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1434 / R1434C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1435 / R1435C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1436 / R1436C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1437 / R1437C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1438 / R1438C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1439 / R1439C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1440 / R1440C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1441 / R1441C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1442 / R1442C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1443 / R1443C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1444 / R1444C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1445 / R1445C15: got '3'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1446 / R1446C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1447 / R1447C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1448 / R1448C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1449 / R1449C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1450 / R1450C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1451 / R1451C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1452 / R1452C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1453 / R1453C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1454 / R1454C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1455 / R1455C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1456 / R1456C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1457 / R1457C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1458 / R1458C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1459 / R1459C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1460 / R1460C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1461 / R1461C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1462 / R1462C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1463 / R1463C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1464 / R1464C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1465 / R1465C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1466 / R1466C15: got '6'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1467 / R1467C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1468 / R1468C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1469 / R1469C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1470 / R1470C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1471 / R1471C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1472 / R1472C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1473 / R1473C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1474 / R1474C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1475 / R1475C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1476 / R1476C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1477 / R1477C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1478 / R1478C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1479 / R1479C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1480 / R1480C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1481 / R1481C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1482 / R1482C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1483 / R1483C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1484 / R1484C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1485 / R1485C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1486 / R1486C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1487 / R1487C15: got '6'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1488 / R1488C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1489 / R1489C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1490 / R1490C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1491 / R1491C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1492 / R1492C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1493 / R1493C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1494 / R1494C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1495 / R1495C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1496 / R1496C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1497 / R1497C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1498 / R1498C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1499 / R1499C15: got '6'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1500 / R1500C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1501 / R1501C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1502 / R1502C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1503 / R1503C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1504 / R1504C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1505 / R1505C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1506 / R1506C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1507 / R1507C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1508 / R1508C15: got '4'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1509 / R1509C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1510 / R1510C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1511 / R1511C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1512 / R1512C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1513 / R1513C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1514 / R1514C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1515 / R1515C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1516 / R1516C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1517 / R1517C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1518 / R1518C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1519 / R1519C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1520 / R1520C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1521 / R1521C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1522 / R1522C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1523 / R1523C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1524 / R1524C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1525 / R1525C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1526 / R1526C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1527 / R1527C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1528 / R1528C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1529 / R1529C15: got '1'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1530 / R1530C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1531 / R1531C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1532 / R1532C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1533 / R1533C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1534 / R1534C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1535 / R1535C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1536 / R1536C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1537 / R1537C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1538 / R1538C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1539 / R1539C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1540 / R1540C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1541 / R1541C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1542 / R1542C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1543 / R1543C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1544 / R1544C15: got '2'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1545 / R1545C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1546 / R1546C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1547 / R1547C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1548 / R1548C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1549 / R1549C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1550 / R1550C15: got '1'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1551 / R1551C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1552 / R1552C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1553 / R1553C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1554 / R1554C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1555 / R1555C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1556 / R1556C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1557 / R1557C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1558 / R1558C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1559 / R1559C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1560 / R1560C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1561 / R1561C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1562 / R1562C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1563 / R1563C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1564 / R1564C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1565 / R1565C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1566 / R1566C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1567 / R1567C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1568 / R1568C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1569 / R1569C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1570 / R1570C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1571 / R1571C15: got '4'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1572 / R1572C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1573 / R1573C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1574 / R1574C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1575 / R1575C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1576 / R1576C15: got '5'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1577 / R1577C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1578 / R1578C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1579 / R1579C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1580 / R1580C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1581 / R1581C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1582 / R1582C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1583 / R1583C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1584 / R1584C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1585 / R1585C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1586 / R1586C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1587 / R1587C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1588 / R1588C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1589 / R1589C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1590 / R1590C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1591 / R1591C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1592 / R1592C15: got '3'
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1593 / R1593C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1594 / R1594C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1595 / R1595C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1596 / R1596C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1597 / R1597C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1598 / R1598C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1599 / R1599C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1600 / R1600C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1601 / R1601C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1602 / R1602C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1603 / R1603C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1604 / R1604C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1605 / R1605C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1606 / R1606C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1607 / R1607C15: got '3'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1608 / R1608C15: got '4'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1609 / R1609C15: got '1'

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting logical in O1610 / R1610C15: got '4'
```

Loading and Cleaning ACS2016

```
demo16 = read_excel("data/ACS_1YR/ACS_16_1YR_S0601.xls")
```

Appending Results to ACS2016

```r
demo16 = as.tibble(bind_cols(demo16, voters_2016)) %>%
  dplyr::select(-1)
```

```r
demo16 = lapply(demo16, function(x) gsub(",", "", x))
demo16 = lapply(demo16, function(x) gsub("N", 0, x))
demo16 = as.data.frame(lapply(demo16, function(x) gsub("%", "", x)), stringsAsFactors = FALSE)
demo16 = as.data.frame(lapply(demo16, function(x) as.numeric(x)))
colnames(demo16) = c("population", "under5", "fiveTo17", "eighteenTo24", "tw5To44", "fourty5To55", "fift
```

```r
demo16.train = slice(demo16, 1:7)
demo16.test = slice(demo16, 8) %>%
  dplyr::select(-43)
```

```r
demo16.fit = lm(votes~median_income + median_age + white + eighteenTo24, data = demo16)
predict(demo16.fit, demo16.test)
```

```
##        1
## 388099.9
```

Formatting Data15

```r
colnames(demo15) = demo15[1,]
demo15 = as.tibble(slice(demo15[-1,]))
demo15 = dplyr::select(demo15, 2:9)
```

Let's try to clean up this data a little bit

```r
elections1 <- elections %>%
  filter(Year <= 2016)

#This ain't right
elect_rm_na <- elections1 %>%
  filter(Prcnt_Turnout == "No Data")


#dist %>%
  #gather(key = var_name, value = value, 2:ncol(dist)) %>%
  #spread_(key = names(dist)[1], value = 'value')

#dist.df <- as.data.frame(dists)

#t_df <- data.table::transpose(dist.df)
#colnames(t_df) <- rownames(dist.df)
#rownames(t_df) <- colnames(dist.df)

#dists_t <- as_tibble(t_df)
#write_csv(dists_t, "dists_t.csv")
```

Basic Visualization

```
#ggplot(data = elections) +
#  geom_point(mapping = aes(x = Year, y = Prcnt_Turnout))

elections1 %>%
  gf_point(Prcnt_Turnout ~ Year) %>%
    gf_lm(Prcnt_Turnout ~ Year, color = "blue")
```
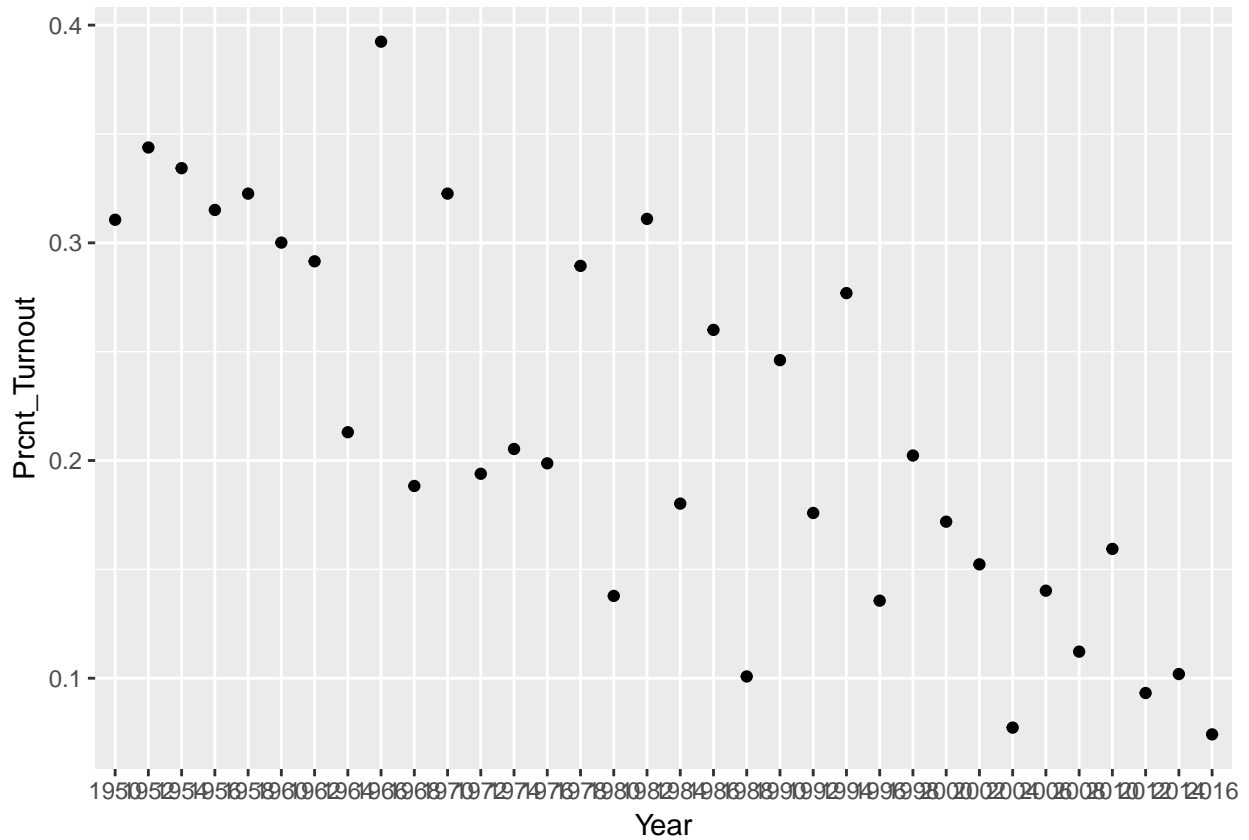


```
elections1 %>%
  gf_point(Num_Voters ~ Year) %>%
  gf_point(Est_Num_Elg_Voters ~ Year) %>%
  gf_lm(Est_Num_Elg_Voters ~ Year)
```
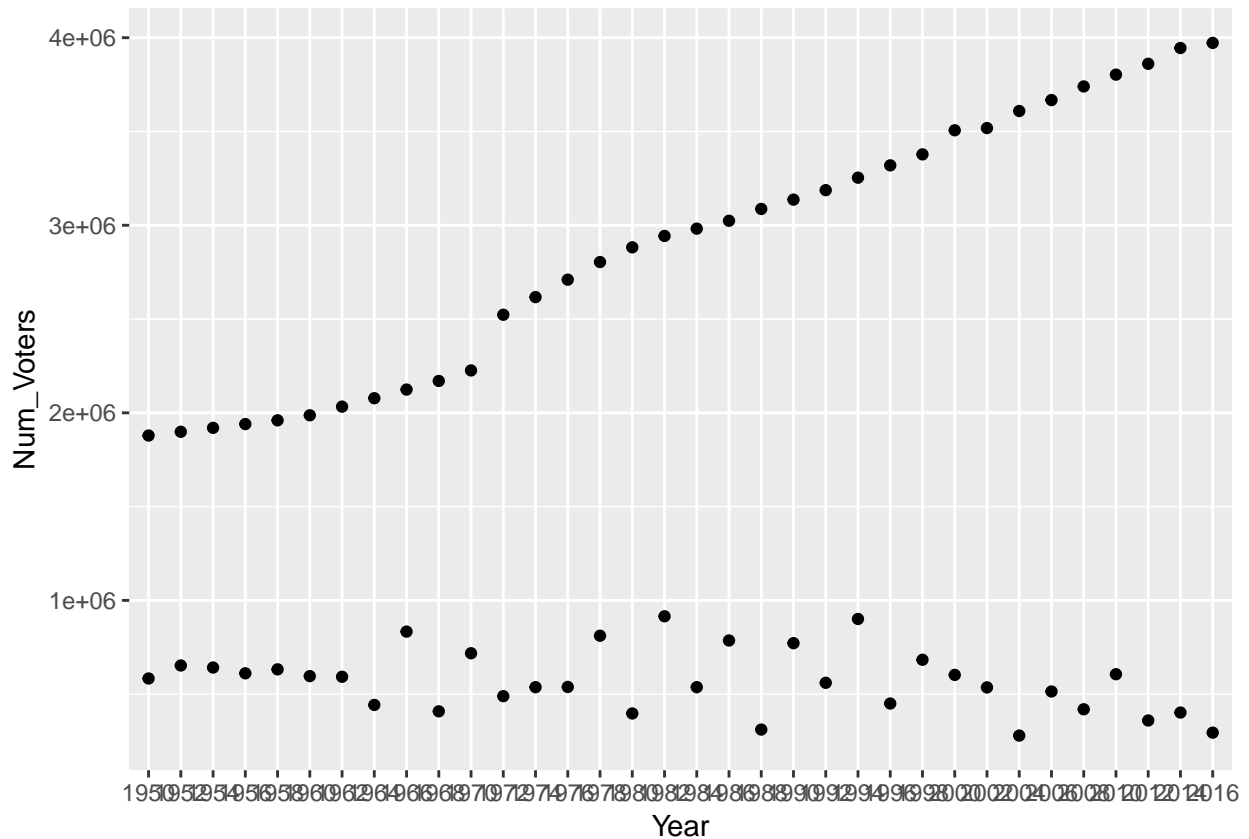
Attempt At Forecasting

```r
district_registration =
  read_excel("data/minnesota-voter-registration-by-county-since-2000.xlsx") %>%
  t() %>%
  as.tibble()
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in B2 / R2C2: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in C2 / R2C3: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in D2 / R2C4: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in E2 / R2C5: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in I2 / R2C9: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in J2 / R2C10: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in K2 / R2C11: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
```

```
## shim, : Expecting numeric in L2 / R2C12: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in M2 / R2C13: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in N2 / R2C14: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in O2 / R2C15: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in P2 / R2C16: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in Q2 / R2C17: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in R2 / R2C18: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in S2 / R2C19: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in T2 / R2C20: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in U2 / R2C21: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in V2 / R2C22: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in W2 / R2C23: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in X2 / R2C24: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in Y2 / R2C25: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in Z2 / R2C26: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AA2 / R2C27: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AB2 / R2C28: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AC2 / R2C29: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AD2 / R2C30: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AE2 / R2C31: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AF2 / R2C32: got a date

## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AG2 / R2C33: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AH2 / R2C34: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AI2 / R2C35: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AJ2 / R2C36: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AK2 / R2C37: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AL2 / R2C38: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AM2 / R2C39: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AN2 / R2C40: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AO2 / R2C41: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AP2 / R2C42: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AQ2 / R2C43: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AR2 / R2C44: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AS2 / R2C45: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AT2 / R2C46: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AU2 / R2C47: got a date
```

```
## Warning in read_fun(path = path, sheet_i = sheet, limits = limits, shim =
## shim, : Expecting numeric in AV2 / R2C48: got a date
```

```r
colnames(district_registration) = district_registration[1,]
district_registration = slice(district_registration, -1)
```

```r
plot.ts(district_registration$Faribault)
```
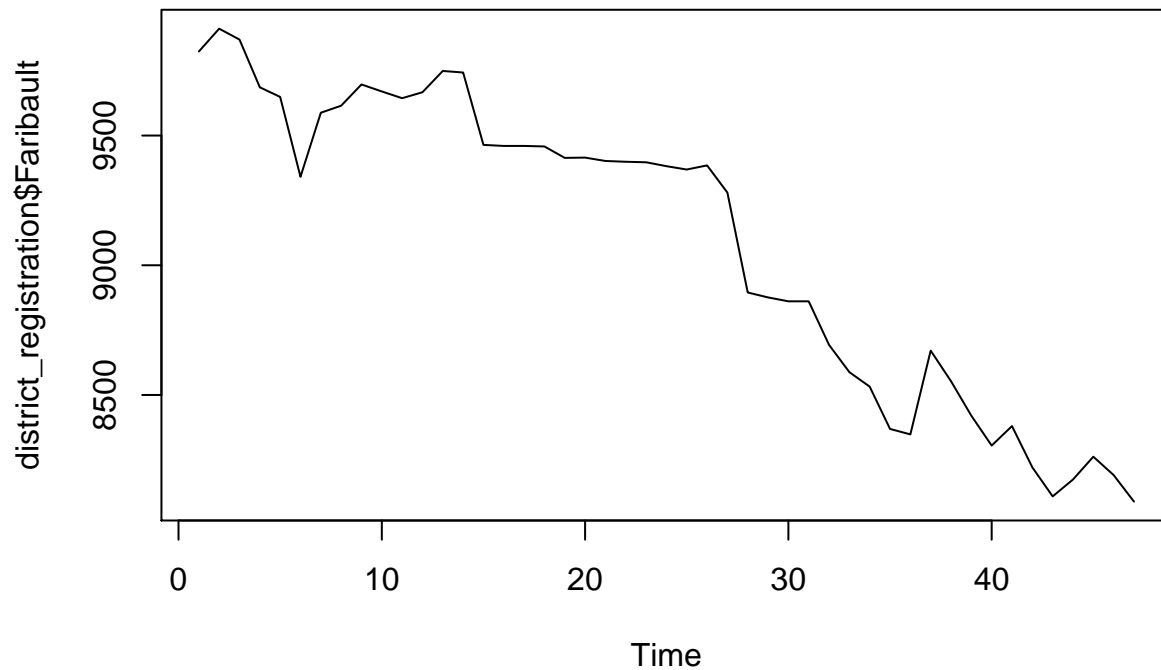
```
fts = ts(district_registration$Faribault, frequency=3)
decomp = stl(fts, s.window="periodic")
deseasonal_cnt <- seasadj(decomp)

fit = auto.arima(deseasonal_cnt, seasonal=FALSE)
fcast <- forecast(fit, h=30)
plot(fcast)
```

Forecasts from ARIMA(0,1,0) with drift