

Untitled

Kynan Bohner

1/28/23

Question 2

```
library(tidyverse)
```

Warning: package 'tidyverse' was built under R version 4.2.2

```
-- Attaching packages ----- tidyverse 1.3.2 --
v ggplot2 3.4.0      v purrr  1.0.1
v tibble  3.1.8      v dplyr  1.0.10
v tidyr   1.2.1      v stringr 1.5.0
v readr   2.1.3      v forcats 0.5.2
```

Warning: package 'ggplot2' was built under R version 4.2.2

Warning: package 'tibble' was built under R version 4.2.2

Warning: package 'tidyr' was built under R version 4.2.2

Warning: package 'readr' was built under R version 4.2.2

Warning: package 'purrr' was built under R version 4.2.2

Warning: package 'dplyr' was built under R version 4.2.2

Warning: package 'stringr' was built under R version 4.2.2

Warning: package 'forcats' was built under R version 4.2.2

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

```
my_vec <- c(
  "+0.07",
  "-0.07",
  "+0.25",
  "-0.84",
  "+0.32",
  "-0.24",
  "-0.97",
  "-0.36",
  "+1.76",
  "-0.36"
)
#1. What data types does the data contain?
class(my_vec)
```

```
[1] "character"
```

```
## Character

#2. Convert to Double and Int

my_vec_double <- as.double(my_vec)
my_vec_integer <- as.integer(my_vec)

#3. Create a new vector my_vec_bool

my_vec_bool <- (my_vec_double > 0)
counter <- 0
for(i in my_vec_bool)
  if(i=="TRUE")
    counter=counter+1
print(counter)
```

```
[1] 4
```

4 elements in my_vec_bool are greater than 0

#4. Sort the values of my_vec_double in ascending order.

```
ascendinglist <- list()
ascendinglist <- sort(my_vec_double, decreasing=F)
print(ascendinglist)
```

```
[1] -0.97 -0.84 -0.36 -0.36 -0.24 -0.07  0.07  0.25  0.32  1.76
```

does this count? it seems to be in decerasing order, depends on what side you consider

Question 3

```
#1.
vec1 <- c(1,2,3,4,5,6,7,8,9)
matrix1 <- matrix(vec1,nrow=3,ncol=3,byrow=T)
#matrix1
```

```
vec100 <- c(1:100)
vec10000 <- c(1:100)^2
matrix2 <- rbind(vec100, vec10000)
#matrix2
```

#2.

```
generate_matrix <- function(n){
  return(
    matrix(
      rnorm(n^2),
      nrow=n, ncol=n # i added this to account for 3.6 where we need the matrix to b
    )
  )
}
```

```
M <- generate_matrix(50)
#M <- generate_matrix(100)
#M <- generate_matrix(1000)
```

```

#M <- generate_matrix(5000)

row_wise_scan <- function(x){
  n <- nrow(x)
  m <- ncol(x)

  count <- 0
  for(i in M)
    for(j in i)
      if(j>=0)
        count <- count + 1

  return(count)
}

a <- row_wise_scan(10)
print(a)

```

[1] 1221

```

#3.

col_wise_scan <- function(x){
  count <- 0
  for(i in M)
    for(j in i)
      if(i>=0)
        count <- count + 1

  return(count)
}

b <- col_wise_scan(10)
print(b)

```

[1] 1221

#4.

The rowwise scanner, because that is how memory is stored

#5.

```
time_scan <- function(f, M){
  initial_time <- Sys.time() # Write your code here
  f(M)
  final_time <- Sys.time() # Write your code here

  total_time_taken <- final_time - initial_time
  return(total_time_taken)
}

list(
  row_wise_time = time_scan(row_wise_scan, M),
  col_wise_time = time_scan(col_wise_scan, M) #changed this to col_wise_scan because it
)
```

\$row_wise_time

Time difference of 0.0004580021 secs

\$col_wise_time

Time difference of 0.0004529953 secs

Rowwise time took less for M(50)

#6.

look where M was defined

we can conclude that the higher the dimensions the less difference between rowwise and

sessionInfo()

R version 4.2.1 (2022-06-23 ucrt)

Platform: x86_64-w64-mingw32/x64 (64-bit)

Running under: Windows 10 x64 (build 19044)

Matrix products: default

locale:

```
[1] LC_COLLATE=English_United States.utf8
[2] LC_CTYPE=English_United States.utf8
[3] LC_MONETARY=English_United States.utf8
[4] LC_NUMERIC=C
[5] LC_TIME=English_United States.utf8
```

attached base packages:

```
[1] stats      graphics  grDevices  datasets  utils      methods    base
```

other attached packages:

```
[1] forcats_0.5.2  stringr_1.5.0  dplyr_1.0.10   purrr_1.0.1
[5] readr_2.1.3    tidyr_1.2.1    tibble_3.1.8   ggplot2_3.4.0
[9] tidyverse_1.3.2
```

loaded via a namespace (and not attached):

```
[1] tidyselect_1.2.0  xfun_0.36      haven_2.5.1
[4] gargle_1.2.1      colorspace_2.0-3  vctrs_0.5.1
[7] generics_0.1.3    htmltools_0.5.4  yaml_2.3.6
[10] utf8_1.2.2        rlang_1.0.6      pillar_1.8.1
[13] withr_2.5.0       glue_1.6.2       DBI_1.1.3
[16] dbplyr_2.2.1      readxl_1.4.1     modelr_0.1.10
[19] lifecycle_1.0.3   munsell_0.5.0    gtable_0.3.1
[22] cellranger_1.1.0  rvest_1.0.3      evaluate_0.20
[25] knitr_1.41        tzdb_0.3.0       fastmap_1.1.0
[28] fansi_1.0.3       broom_1.0.2      renv_0.16.0-53
[31] backports_1.4.1   scales_1.2.1     googlesheets4_1.0.1
[34] jsonlite_1.8.4    fs_1.5.2         hms_1.1.2
[37] digest_0.6.31     stringi_1.7.12   grid_4.2.1
[40] cli_3.6.0         tools_4.2.1      magrittr_2.0.3
[43] crayon_1.5.2      pkgconfig_2.0.3  ellipsis_0.3.2
[46] xml2_1.3.3        reprex_2.0.2     googledrive_2.0.0
[49] lubridate_1.9.0   timechange_0.2.0  assertthat_0.2.1
[52] rmarkdown_2.20    httr_1.4.4       rstudioapi_0.14
[55] R6_2.5.1          compiler_4.2.1
```

```
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```

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[6] tidyr_1.2.1    tibble_3.1.8   ggplot2_3.4.0  tidyverse_1.3.2

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 [5] colorspace_2.0-3 vctrs_0.5.1    generics_0.1.3  utf8_1.2.2
 [9] rlang_1.0.6       pillar_1.8.1   glue_1.6.2      withr_2.5.0
[13] DBI_1.1.3         dbplyr_2.2.1   modelr_0.1.10   readxl_1.4.1
[17] lifecycle_1.0.3   munsell_0.5.0  gtable_0.3.1    cellranger_1.1.0
[21] rvest_1.0.3       knitr_1.41     tzdb_0.3.0      fansi_1.0.3
[25] broom_1.0.2       renv_0.16.0-53 scales_1.2.1     backports_1.4.1
[29] googlesheets4_1.0.1 jsonlite_1.8.4 fs_1.5.2         hms_1.1.2
[33] stringi_1.7.12    grid_4.2.1     cli_3.6.0       tools_4.2.1
[37] magrittr_2.0.3    crayon_1.5.2   pkgconfig_2.0.3 ellipsis_0.3.2
[41] xml2_1.3.3        reprex_2.0.2   googledrive_2.0.0 lubridate_1.9.0
[45] timechange_0.2.0  assertthat_0.2.1 httr_1.4.4      rstudioapi_0.14
[49] R6_2.5.1          compiler_4.2.1

Run All Chunks AboveRun Current Chunk'

```

[illegible]

```
sapply(1:100, function(i) {
  x <- generate_matrix(100)
  row_wise_scan(x) == col_wise_scan(x)
}) %>% sum == 100
```

```
[1] TRUE
```

```
#it reports TRUE so i will assume nothing wrong with my code
```

```
##Git Push said everything up to date
```