Homework #1

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Challenge 1

```
library(readr)
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.0 --
```

```
## v ggplot2 3.3.3     v dplyr   1.0.4
## v tibble  3.0.6     v stringr 1.4.0
## v tidyr   1.1.2     v forcats 0.5.1
## v purrr   0.3.4
```

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

```
library(dplyr)

#load in data
f <- "~/Desktop/Documents/UT Austin/Spring 2021/ANT388_Applied data analysis/Development/Repos/Pengilley
d <- read.delim(f, header = TRUE, sep = "\n", stringsAsFactors = FALSE, fill = TRUE)

(dim(d)) #to show how many paragraphs/rows there are (n=56)
```

```
## [1] 56  1
```

```
#print 34th row
d[34, ]
```

```
## [1] "The fact, as we have seen, that all past and present organic beings can be arranged within a few
```

```
#splitting the whole chapter
library(stringr)

d_no_punctuation <- tolower(gsub("[[:punct:]]","", d))
d_converted <- str_remove_all(d_no_punctuation, "[\r\n]")
split <- str_split(d_converted, " ") #new vector called split


#number of unique variables
unique_split <- unique(unlist(split))
length(unique_split)
```

```
## [1] 1967
```

```r
#most common word
head(sort(table(split),decreasing=TRUE), 1)
```

```
## split
## the
## 753
```

```r
#words that appear once
counts <- table(split)
single <- names(counts)[counts == 1]
length(single)
```

```
## [1] 1014
```

```r
#words that appear five or more times

five_plus <- names(counts)[counts >= 5]
length(five_plus)
```

```
## [1] 362
```

```r
#extract final paragraph and assign to new variable
final_quote <-d[56,]
(split_quote <- unlist(str_split(final_quote, " ")))
```

```
##   [1] "It"             "is"            "interesting"   "to"
##   [5] "contemplate"    "a"             "tangled"       "bank,"
##   [9] "clothed"        "with"          "many"          "plants"
##  [13] "of"             "many"          "kinds,"        "with"
##  [17] "birds"          "singing"       "on"            "the"
##  [21] "bushes,"        "with"          "various"       "insects"
##  [25] "flitting"       "about,"        "and"           "with"
##  [29] "worms"          "crawling"      "through"       "the"
##  [33] "damp"           "earth,"        "and"           "to"
##  [37] "reflect"        "that"          "these"         "elaborately"
##  [41] "constructed"    "forms,"        "so"            "different"
##  [45] "from"           "each"          "other,"        "and"
##  [49] "dependent"      "upon"          "each"          "other"
##  [53] "in"             "so"            "complex"       "a"
##  [57] "manner,"        "have"          "all"           "been"
##  [61] "produced"       "by"            "laws"          "acting"
##  [65] "around"         "us."           "These"         "laws,"
##  [69] "taken"          "in"            "the"           "largest"
##  [73] "sense,"         "being"         "Growth"        "with"
##  [77] "reproduction;"  "Inheritance"   "which"         "is"
##  [81] "almost"         "implied"       "by"            "reproduction;"
##  [85] "Variability"    "from"          "the"           "indirect"
##  [89] "and"            "direct"        "action"        "of"
##  [93] "the"            "conditions"    "of"            "life,"
##  [97] "and"            "from"          "use"           "and"
## [101] "disuse;"        "a"             "Ratio"         "of"
## [105] "Increase"       "so"            "high"          "as"
## [109] "to"             "lead"          "to"            "a"
## [113] "Struggle"       "for"           "Life,"         "and"
## [117] "as"             "a"             "consequence"   "to"
## [121] "Natural"        "Selection,"    "entailing"     "Divergence"
```

```
## [125] "of"          "Character"     "and"          "the"
## [129] "Extinction"   "of"            "less"         "improved"
## [133] "forms."       "Thus,"         "from"         "the"
## [137] "war"          "of"            "nature,"      "from"
## [141] "famine"       "and"           "death,"       "the"
## [145] "most"         "exalted"       "object"       "which"
## [149] "we"           "are"           "capable"      "of"
## [153] "conceiving,"  "namely,"       "the"          "production"
## [157] "of"           "the"           "higher"       "animals,"
## [161] "directly"     "follows."      "There"        "is"
## [165] "grandeur"     "in"            "this"         "view"
## [169] "of"           "life,"         "with"         "its"
## [173] "several"      "powers,"       "having"       "been"
## [177] "originally"   "breathed"      "by"           "the"
## [181] "Creator"      "into"          "a"            "few"
## [185] "forms"        "or"            "into"         "one;"
## [189] "and"          "that,"         "whilst"       "this"
## [193] "planet"       "has"           "gone"         "circling"
## [197] "on"           "according"     "to"           "the"
## [201] "fixed"        "law"           "of"           "gravity,"
## [205] "from"         "so"            "simple"       "a"
## [209] "beginning"    "endless"       "forms"        "most"
## [213] "beautiful"    "and"           "most"         "wonderful"
## [217] "have"         "been,"         "and"          "are"
## [221] "being"        "evolved."      ""
```

```r
#third element
(every_third <- split_quote[seq(3, length(split_quote), 3)])
```

```
##  [1] "interesting"  "a"             "clothed"      "plants"
##  [5] "kinds,"       "singing"       "bushes,"      "insects"
##  [9] "and"          "crawling"      "damp"         "to"
## [13] "these"        "forms,"        "from"         "and"
## [17] "each"         "so"            "manner,"      "been"
## [21] "laws"         "us."           "taken"        "largest"
## [25] "Growth"       "Inheritance"   "almost"       "reproduction;"
## [29] "the"          "direct"        "the"          "life,"
## [33] "use"          "a"             "Increase"     "as"
## [37] "to"           "for"           "as"           "to"
## [41] "entailing"    "Character"     "Extinction"   "improved"
## [45] "from"         "of"            "famine"       "the"
## [49] "object"       "are"           "conceiving,"  "production"
## [53] "higher"       "follows."      "grandeur"     "view"
## [57] "with"         "powers,"       "originally"   "the"
## [61] "a"            "or"            "and"          "this"
## [65] "gone"         "according"     "fixed"        "gravity,"
## [69] "simple"       "endless"       "beautiful"    "wonderful"
## [73] "and"          "evolved."
```

```r
#sort into reverse alphabetical order
(sort(every_third, decreasing = TRUE))
```

```
##  [1] "wonderful"    "with"          "view"         "use"
##  [5] "us."          "to"            "to"           "to"
##  [9] "this"         "these"         "the"          "the"
## [13] "the"          "the"           "taken"        "so"
```

```
## [17] "singing"        "simple"       "reproduction;" "production"
## [21] "powers,"        "plants"       "originally"    "or"
## [25] "of"             "object"       "manner,"       "life,"
## [29] "laws"           "largest"      "kinds,"        "interesting"
## [33] "insects"        "Inheritance"  "Increase"      "improved"
## [37] "higher"         "Growth"       "gravity,"      "grandeur"
## [41] "gone"           "from"         "from"          "forms,"
## [45] "for"            "follows."     "fixed"         "famine"
## [49] "Extinction"     "evolved."     "entailing"     "endless"
## [53] "each"           "direct"       "damp"          "crawling"
## [57] "conceiving,"    "clothed"      "Character"     "bushes,"
## [61] "been"           "beautiful"    "as"            "as"
## [65] "are"            "and"          "and"           "and"
## [69] "and"            "almost"       "according"     "a"
## [73] "a"              "a"
```

Challenge 2

```r
t <- c(35, 88, 42, 84, 81, 30)
city <- c("Bejing", "Lagos", "Paris", "Rio de Janeiro", "San Juan", "Toronto")

names(t) <- city
print(t)
```

```
##         Bejing          Lagos          Paris Rio de Janeiro       San Juan
##             35             88             42             84             81
##        Toronto
##             30
```

```r
#first three city temps
(t[1:3])
```

```
## Bejing  Lagos  Paris
##     35     88     42
```

```r
#temp of Paris and San Juan
(t[c(3, 5)])
```

```
##    Paris San Juan
##       42       81
```

Challenge 3

```r
#Challenge 3a
m1 <- matrix(
  data = c(160:1),
  nrow = 8,
  ncol = 20,
  byrow = FALSE
)
m1
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11] [,12] [,13] [,14]
## [1,]  160  152  144  136  128  120  112  104   96    88    80    72    64    56
## [2,]  159  151  143  135  127  119  111  103   95    87    79    71    63    55
## [3,]  158  150  142  134  126  118  110  102   94    86    78    70    62    54
```

```
## [4,]   157   149   141   133   125   117   109   101    93    85    77    69    61    53
## [5,]   156   148   140   132   124   116   108   100    92    84    76    68    60    52
## [6,]   155   147   139   131   123   115   107    99    91    83    75    67    59    51
## [7,]   154   146   138   130   122   114   106    98    90    82    74    66    58    50
## [8,]   153   145   137   129   121   113   105    97    89    81    73    65    57    49
##       [,15] [,16] [,17] [,18] [,19] [,20]
## [1,]    48    40    32    24    16     8
## [2,]    47    39    31    23    15     7
## [3,]    46    38    30    22    14     6
## [4,]    45    37    29    21    13     5
## [5,]    44    36    28    20    12     4
## [6,]    43    35    27    19    11     3
## [7,]    42    34    26    18    10     2
## [8,]    41    33    25    17     9     1
```

```r
#extract single element
m1[5, 2]
```

```
## [1] 148
```

```r
#extract rows
m1[5:7, ]
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11] [,12] [,13] [,14]
## [1,]  156  148  140  132  124  116  108  100   92    84    76    68    60    52
## [2,]  155  147  139  131  123  115  107   99   91    83    75    67    59    51
## [3,]  154  146  138  130  122  114  106   98   90    82    74    66    58    50
##       [,15] [,16] [,17] [,18] [,19] [,20]
## [1,]    44    36    28    20    12     4
## [2,]    43    35    27    19    11     3
## [3,]    42    34    26    18    10     2
```

```r
#extract and create new variable
m2 <- m1[3:6, 4:9]
m2
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6]
## [1,]  134  126  118  110  102   94
## [2,]  133  125  117  109  101   93
## [3,]  132  124  116  108  100   92
## [4,]  131  123  115  107   99   91
```

```r
#class and mode of m2
(class(m2))
```

```
## [1] "matrix" "array"
```

```r
(mode(m2))
```

```
## [1] "numeric"
```

Challenge 4

```r
d <- seq(from = 2, to = 800, by = 2)
a <- array(data = d, dim = c(5, 5, 4, 4), dimnames = NULL)
a
```

```
## , , 1, 1
##
```

```
##         [,1] [,2] [,3] [,4] [,5]
## [1,]      2   12   22   32   42
## [2,]      4   14   24   34   44
## [3,]      6   16   26   36   46
## [4,]      8   18   28   38   48
## [5,]     10   20   30   40   50
##
## , , 2, 1
##
##         [,1] [,2] [,3] [,4] [,5]
## [1,]     52   62   72   82   92
## [2,]     54   64   74   84   94
## [3,]     56   66   76   86   96
## [4,]     58   68   78   88   98
## [5,]     60   70   80   90  100
##
## , , 3, 1
##
##         [,1] [,2] [,3] [,4] [,5]
## [1,]    102  112  122  132  142
## [2,]    104  114  124  134  144
## [3,]    106  116  126  136  146
## [4,]    108  118  128  138  148
## [5,]    110  120  130  140  150
##
## , , 4, 1
##
##         [,1] [,2] [,3] [,4] [,5]
## [1,]    152  162  172  182  192
## [2,]    154  164  174  184  194
## [3,]    156  166  176  186  196
## [4,]    158  168  178  188  198
## [5,]    160  170  180  190  200
##
## , , 1, 2
##
##         [,1] [,2] [,3] [,4] [,5]
## [1,]    202  212  222  232  242
## [2,]    204  214  224  234  244
## [3,]    206  216  226  236  246
## [4,]    208  218  228  238  248
## [5,]    210  220  230  240  250
##
## , , 2, 2
##
##         [,1] [,2] [,3] [,4] [,5]
## [1,]    252  262  272  282  292
## [2,]    254  264  274  284  294
## [3,]    256  266  276  286  296
## [4,]    258  268  278  288  298
## [5,]    260  270  280  290  300
##
## , , 3, 2
##
```

```
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   302  312  322  332  342
## [2,]   304  314  324  334  344
## [3,]   306  316  326  336  346
## [4,]   308  318  328  338  348
## [5,]   310  320  330  340  350
##
## , , 4, 2
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   352  362  372  382  392
## [2,]   354  364  374  384  394
## [3,]   356  366  376  386  396
## [4,]   358  368  378  388  398
## [5,]   360  370  380  390  400
##
## , , 1, 3
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   402  412  422  432  442
## [2,]   404  414  424  434  444
## [3,]   406  416  426  436  446
## [4,]   408  418  428  438  448
## [5,]   410  420  430  440  450
##
## , , 2, 3
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   452  462  472  482  492
## [2,]   454  464  474  484  494
## [3,]   456  466  476  486  496
## [4,]   458  468  478  488  498
## [5,]   460  470  480  490  500
##
## , , 3, 3
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   502  512  522  532  542
## [2,]   504  514  524  534  544
## [3,]   506  516  526  536  546
## [4,]   508  518  528  538  548
## [5,]   510  520  530  540  550
##
## , , 4, 3
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   552  562  572  582  592
## [2,]   554  564  574  584  594
## [3,]   556  566  576  586  596
## [4,]   558  568  578  588  598
## [5,]   560  570  580  590  600
##
## , , 1, 4
##
```

```
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   602  612  622  632  642
## [2,]   604  614  624  634  644
## [3,]   606  616  626  636  646
## [4,]   608  618  628  638  648
## [5,]   610  620  630  640  650
##
## , , 2, 4
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   652  662  672  682  692
## [2,]   654  664  674  684  694
## [3,]   656  666  676  686  696
## [4,]   658  668  678  688  698
## [5,]   660  670  680  690  700
##
## , , 3, 4
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   702  712  722  732  742
## [2,]   704  714  724  734  744
## [3,]   706  716  726  736  746
## [4,]   708  718  728  738  748
## [5,]   710  720  730  740  750
##
## , , 4, 4
##
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   752  762  772  782  792
## [2,]   754  764  774  784  794
## [3,]   756  766  776  786  796
## [4,]   758  768  778  788  798
## [5,]   760  770  780  790  800
```

```r
(a[1, 1, 1, 2])
```

```
## [1] 202
```

```r
(a[2, 3, 2, ])
```

```
## [1]  74 274 474 674
```

```r
(a[1:5, 1:5, 3, 3])
```

```
##        [,1] [,2] [,3] [,4] [,5]
## [1,]   502  512  522  532  542
## [2,]   504  514  524  534  544
## [3,]   506  516  526  536  546
## [4,]   508  518  528  538  548
## [5,]   510  520  530  540  550
```

Challenge 5

```r
#creating a list called Primates
Primates <- list(Strepsirhini = list(Lorisiformes = list(Lorisidae = c("Lorisidae", "Galagidae")),
                                     Lemuriformes = list(Lorisoidae = c("Cheirogaleidae", "Lepilemuridae"
```

```
                    Haplorhini = list(Tarsiiformes = list(Tarsioidea = "Tarsiidae"),
                            Simiiformes = list(Platyrrhini = list(Ceboidea = c("Cebidae", "Atelida
                                    Catarrhini = list(Hominoidae = c("Hylobatidae", "He
)

#New World Monkeys
(nwm <- Primates[["Haplorhini"]][["Simiiformes"]][["Platyrrhini"]])
```

```
## $Ceboidea
## [1] "Cebidae"     "Atelidae"     "Pitheciidae"
```

```
class(nwm)
```

```
## [1] "list"
```

```
mode(nwm)
```

```
## [1] "list"
```

```
#Extracting the tarisers
Primates$Haplorhini$Tarsiiformes$Tarsioidea
```

```
## [1] "Tarsiidae"
```