SAL 413 HW1

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R Markdown

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When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

Question 1.

```
hundred <- 1:100

hundred_list <- map_chr(hundred, function(i) {
  if (i %% 3 == 0 & i %% 7 == 0) {
    "FGorTD"
  } else if (i %% 7 == 0) {
    "TD"
  } else if (i %% 3 == 0) {
    "FG"
  } else {
    as.character(i)
  }

})

final_hundred <- paste(hundred_list, collapse = " ")
final_hundred
```

[1] "1 2 FG 4 5 FG TD 8 FG 10 11 FG 13 TD FG 16 17 FG 19 20 FGorTD 22 23 FG 25 26 FG TD 29 FG 31 32 FG 34 TD FG 37 38 FG 40 41 FGorTD 43 44 FG 46 47 FG TD 50 FG 52 53 FG 55 TD FG 58 59 FG 61 62 FGorTD 64 65 FG 67 68 FG TD 71 FG 73 74 FG 76 TD FG 79 80 FG 82 83 FGorTD 85 86 FG 88 89 FG TD 92 FG 94 95 FG 97 TD FG 100"

Question 2:

```
#a#
kenpom <- read.csv("kenpom_23.csv")
new_kenpom <- kenpom[c(26, 53, 74, 91, 102, 152, 169, 188, 202, 217,
                       231, 290, 341, 342, 345), ]
new_kenpom
```

```
##     Season       TeamName   Tempo RankTempo AdjTempo RankAdjTempo       OE
## 26    2023 Boston College 66.7362       240  66.4192          216  99.2327
## 53    2023        Clemson 68.0527       177  68.1222          135 108.9190
## 74    2023           Duke 65.5215       302  64.8614          298 109.7080
## 91    2023    Florida St. 69.0152       126  68.5538          113 100.5410
## 102   2023   Georgia Tech 67.3737       211  66.5447          212 101.3320
## 152   2023     Louisville 67.0437       227  66.3638          218  95.5827
## 169   2023       Miami FL 68.9572       131  68.8375           97 114.0900
## 188   2023     N.C. State 69.7994        88  68.9506           91 110.7070
## 202   2023 North Carolina 69.3638       107  68.8086           99 107.6560
## 217   2023     Notre Dame 65.4171       306  64.7555          304 105.9610
## 231   2023     Pittsburgh 68.0594       176  67.2969          171 110.5170
## 290   2023       Syracuse 68.3193       163  67.3181          170 107.8180
## 341   2023       Virginia 62.4659       360  61.4801          360 108.1870
## 342   2023  Virginia Tech 66.8475       235  66.5612          211 110.8000
## 345   2023    Wake Forest 70.0839        74  69.4210           66 108.4310
##     RankOE   AdjOE RankAdjOE       DE RankDE    AdjDE RankAdjDE     AdjEM
## 26     275 102.601       227 104.6580    221 102.6430       125 -0.041905
## 53      55 110.433        82  98.9683     77  98.3921        61 12.040700
## 74      41 113.218        40  96.7324     43  93.8633        16 19.354600
## 91     248 105.378       162 110.5040    326 107.7860       239 -2.408570
## 102    226 104.420       182 105.9830    249 103.8510       149  0.568863
## 152    330 101.469       251 113.3980    355 111.3210       312 -9.852090
## 169      9 119.144         6 103.8580    198 101.2040        99 17.939500
## 188     30 113.551        35 101.3230    129 100.0040        82 13.546700
## 202     80 112.241        51 100.2560     96  97.2304        46 15.010500
## 217    110 108.771       104 109.6390    315 108.3750       255  0.396165
## 231     32 114.206        29 102.5740    153 101.3450       103 12.861900
## 290     77 110.469        81 106.2800    261 105.5430       185  4.926310
## 341     69 110.844        72  96.4862     40  94.4733        25 16.370400
## 342     27 113.939        31 104.4530    218 103.4290       139 10.509600
## 345     64 112.133        52 104.6390    220 103.0810       133  9.051500
##     RankAdjEM
## 26        170
## 53         68
## 74         18
## 91        205
## 102       161
## 152       290
## 169        24
## 188        52
## 202        43
## 217       166
## 231        59
## 290       118
## 341        34
```

```
## 342         80
## 345         86
```

```r
#b#
ordered_kenpom <- new_kenpom[order(-new_kenpom$AdjEM), ]
ordered_kenpom
```

```
##     Season       TeamName   Tempo RankTempo AdjTempo RankAdjTempo       OE
## 74    2023           Duke 65.5215       302  64.8614          298 109.7080
## 169   2023       Miami FL 68.9572       131  68.8375           97 114.0900
## 341   2023       Virginia 62.4659       360  61.4801          360 108.1870
## 202   2023 North Carolina 69.3638       107  68.8086           99 107.6560
## 188   2023     N.C. State 69.7994        88  68.9506           91 110.7070
## 231   2023     Pittsburgh 68.0594       176  67.2969          171 110.5170
## 53    2023        Clemson 68.0527       177  68.1222          135 108.9190
## 342   2023  Virginia Tech 66.8475       235  66.5612          211 110.8000
## 345   2023    Wake Forest 70.0839        74  69.4210           66 108.4310
## 290   2023       Syracuse 68.3193       163  67.3181          170 107.8180
## 102   2023   Georgia Tech 67.3737       211  66.5447          212 101.3320
## 217   2023     Notre Dame 65.4171       306  64.7555          304 105.9610
## 26    2023 Boston College 66.7362       240  66.4192          216  99.2327
## 91    2023    Florida St. 69.0152       126  68.5538          113 100.5410
## 152   2023     Louisville 67.0437       227  66.3638          218  95.5827
##     RankOE   AdjOE RankAdjOE       DE RankDE    AdjDE RankAdjDE     AdjEM
## 74      41 113.218        40  96.7324     43  93.8633        16 19.354600
## 169      9 119.144         6 103.8580    198 101.2040        99 17.939500
## 341     69 110.844        72  96.4862     40  94.4733        25 16.370400
## 202     80 112.241        51 100.2560     96  97.2304        46 15.010500
## 188     30 113.551        35 101.3230    129 100.0040        82 13.546700
## 231     32 114.206        29 102.5740    153 101.3450       103 12.861900
## 53      55 110.433        82  98.9683     77  98.3921        61 12.040700
## 342     27 113.939        31 104.4530    218 103.4290       139 10.509600
## 345     64 112.133        52 104.6390    220 103.0810       133  9.051500
## 290     77 110.469        81 106.2800    261 105.5430       185  4.926310
## 102    226 104.420       182 105.9830    249 103.8510       149  0.568863
## 217    110 108.771       104 109.6390    315 108.3750       255  0.396165
## 26     275 102.601       227 104.6580    221 102.6430       125 -0.041905
## 91     248 105.378       162 110.5040    326 107.7860       239 -2.408570
## 152    330 101.469       251 113.3980    355 111.3210       312 -9.852090
##     RankAdjEM
## 74         18
## 169        24
## 341        34
## 202        43
## 188        52
## 231        59
## 53         68
## 342        80
## 345        86
## 290       118
## 102       161
## 217       166
## 26        170
## 91        205
## 152       290
```

```r
#c#
kenpom_matrix <- matrix(c(ordered_kenpom$TeamName, ordered_kenpom$AdjEM), ncol = 2)
colnames(kenpom_matrix) <- c("TeamName", "AdjEM")
kenpom_matrix
```

```
##       TeamName         AdjEM
##  [1,] "Duke"           "19.3546"
##  [2,] "Miami FL"       "17.9395"
##  [3,] "Virginia"       "16.3704"
##  [4,] "North Carolina" "15.0105"
##  [5,] "N.C. State"     "13.5467"
##  [6,] "Pittsburgh"     "12.8619"
##  [7,] "Clemson"        "12.0407"
##  [8,] "Virginia Tech"  "10.5096"
##  [9,] "Wake Forest"    "9.0515"
## [10,] "Syracuse"       "4.92631"
## [11,] "Georgia Tech"   "0.568863"
## [12,] "Notre Dame"     "0.396165"
## [13,] "Boston College" "-0.041905"
## [14,] "Florida St."    "-2.40857"
## [15,] "Louisville"     "-9.85209"
```

```r
#d#
mat_to_tibble <- function(mat) {
  tibble <- as_tibble(mat)
  tibble %>% mutate(row = rownames(tibble)) -> tibble
  tibble %>% pivot_longer(cols = -row, names_to = "Column",
                          values_to = "Value") -> tibble
  return(tibble)
}

function_check <- mat_to_tibble(kenpom_matrix)
colnames(function_check) <- c("Row(Rank)", "Column", "Values")
function_check
```

```
## # A tibble: 30 x 3
##    `Row(Rank)` Column   Values
##    <chr>       <chr>    <chr>
##  1 1           TeamName Duke
##  2 1           AdjEM    19.3546
##  3 2           TeamName Miami FL
##  4 2           AdjEM    17.9395
##  5 3           TeamName Virginia
##  6 3           AdjEM    16.3704
##  7 4           TeamName North Carolina
##  8 4           AdjEM    15.0105
##  9 5           TeamName N.C. State
## 10 5           AdjEM    13.5467
## # i 20 more rows
```

Question 3.

```
#ggplot scatterplot#
ggplot(ordered_kenpom, aes(x = AdjOE, y = AdjDE)) +
  geom_point() +
  labs(title = "2023 ACC Teams AdjOE vs AdjDE") +
  geom_cfb_logos(aes(team = TeamName), width = 0.075)
```