```
                                    #SETUP

setwd("/Users/Jeremy/Desktop")
library(gtools)
library(tidyverse)
library(arrangements)

#Objection creation: Days
Days <- c("Monday Morning", "Monday Afternoon", "Monday Evening", "Tuesday
 Morning", "Tuesday Afternoon", "Tuesday Evening", "Wednesday Morning", "Wednesday
 Afternoon", "Wednesday Evening", "Thursday Morning", "Thursday Afternoon",
 "Thursday Evening", "Friday Morning", "Friday Afternoon", "Friday Evening",
 "Saturday Morning", "Saturday Afternoon", "Sunday")

                                    #ADULT PROGRAMS


                                    #LECTURES

#I Attended
Adult_Lectures_Attended <- sample(c("Political","Environmental","City/Local
 Government","Author Talk", "Technology","Health/Wellness", "Art/Culture"), 512,
 replace = T,
          prob = c(0.07987711, 0.18817204, 0.07642089, 0.18317972, 0.19047619,
 0.14285714, 0.13901690))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Adult_Lectures_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
          prob = c(0.21428571, 0.08766234, 0.29285714, 0.09480519, 0.07597403,
 0.23441558))


#Mon-Sun; Morning, Afternoon, Evening
Adult_Lectures_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Adult_Lectures_When) <-
 c("Adult_Lectures_Day1","Adult_Lectures_Day2","Adult_Lectures_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Adult_Lectures_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",

 "Business/Finance","Gaming","Health/Wellness","Other"), 512, replace = T,
```

```
          prob = c(0.01645475, 0.13089005, 0.24906507, 0.17801047, 0.02169035,
 0.35527300, 0.04861631))


Adult_Lectures <-
 cbind(Adult_Lectures_Attended,Adult_Lectures_How_Hear,Adult_Lectures_What_Type,
 Adult_Lectures_When)


                                    #MOVIES
#I Attended
Adult_Movies_Attended <-  sample(c("Romantic Comedy", "Horror", "Documentary",
 "Thriller", "Other"), 512, replace = T,
          prob = c(0.32709581, 0.01796407, 0.15868263, 0.13173653, 0.36452096))

#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Adult_Movies_How_Hear <- sample(c("Facebook", "Word of Mouth", "Library Website",
 "Newspaper", "In-house Marketing", "Other"), 512, replace = T,
          prob = c(0.04324684, 0.31470393, 0.11044578, 0.16566866, 0.18829009,
 0.17764471))


#Mon-Sun; Morning, Afternoon, Evening
Adult_Movies_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Adult_Movies_When) <-
 c("Adult_Movies_Day1","Adult_Movies_Day2","Adult_Movies_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Adult_Movies_What_Type <- sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Business/Finance","Gaming","Health/Wellness","Other"), 512, replace = T,
          prob = c(0.06264683, 0.13782302, 0.24588880, 0.06812843, 0.07830854,
 0.03523884, 0.37196554))


Adult_Movies <- cbind(Adult_Movies_Attended, Adult_Movies_How_Hear,
 Adult_Movies_What_Type, Adult_Movies_When)


                                    #WRITING WORKSHOPS
#I Attended
Adult_Workshops_Attended <- sample(c("Technical Writing", "Poetry", "Resume",
 "Creative Writing", "Other"), 512, replace = T,
           prob = c(0.1048343, 0.2520369, 0.1466594, 0.2569256, 0.2395437))
```

```
#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Adult_Workshops_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
            prob = c(0.12044374, 0.12202853, 0.09746434, 0.16798732, 0.38668780,
 0.10538827))


#Mon-Sun; Morning, Afternoon, Evening
Adult_Workshops_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Adult_Workshops_When) <-
 c("Adult_Workshops_Day1","Adult_Workshops_Day2","Adult_Workshops_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Adult_Workshops_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Business/Finance","Gaming","Health/Wellness","Other"), 512, replace = T,
            prob = c(0.15652174, 0.12077295, 0.12657005, 0.21159420, 0.13429952,
 0.08888889, 0.16135266))


Adult_Workshops <- cbind(Adult_Workshops_Attended, Adult_Workshops_How_Hear,
 Adult_Workshops_What_Type, Adult_Workshops_When)


                                #LARGE EVENTS

#I Attended
Adult_Large_Events_Attended <- sample(c("Virtual Reality", "Murder Mystery",
 "Book Signing", "Other"), 512, replace = T,
            prob = c(0.5353728, 0.1395793, 0.1376673, 0.1873805))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Adult_Large_Events_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
            prob = c(0.09473198, 0.22319778, 0.07255083, 0.22227357, 0.19685767,
 0.19038817))


#Mon-Sun; Morning, Afternoon, Evening
Adult_Large_Events_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Adult_Large_Events_When) <-
 c("Adult_Large_Events_Day1","Adult_Large_Events_Day2","Adult_Large_Events_Day3")
```

```r
#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Adult_Large_Events_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Business/Finance","Gaming","Health/Wellness","Other"), 512, replace = T,
            prob = c(0.004867872, 0.156467316, 0.093880389, 0.203059805,
 0.191933241, 0.005563282, 0.344228095))

Adult_Large_Events <- cbind(Adult_Large_Events_Attended,
 Adult_Large_Events_How_Hear, Adult_Large_Events_What_Type,
 Adult_Large_Events_When)


                                    #BOOK CLUB

#I Attended
Adult_Book_Club_Attended <- sample(c("Crime Book Club", "Romance Book Club",
 "Teen Book Club", "Manga Book Club", "Classics Book Club"), 512, replace = T,
            prob = c(0.1690141, 0.3023474, 0.1173709, 0.1267606, 0.2845070))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Adult_Book_Club_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
            prob = c(0.36649660, 0.07312925, 0.19557823, 0.13010204, 0.20238095,
 0.03231293))


#Mon-Sun; Morning, Afternoon, Evening
Adult_Book_Club_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Adult_Book_Club_When) <-
 c("Adult_Book_Club_Day1","Adult_Book_Club_Day2","Adult_Book_Club_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Adult_Book_Club_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Business/Finance","Gaming","Health/Wellness","Other"), 512, replace = T,
            prob = c(0.17725753, 0.19119287, 0.09308807, 0.03957637, 0.04347826,
 0.26700111, 0.18840580))


Adult_Book_Club <- cbind(Adult_Book_Club_Attended, Adult_Book_Club_How_Hear,
 Adult_Book_Club_What_Type, Adult_Book_Club_When)
```

```
                                    #ADULT PROGRAM AGGREGATION

Adult_Programs <- cbind(Adult_Book_Club, Adult_Large_Events, Adult_Lectures,
 Adult_Movies, Adult_Workshops)

Active_Adult_Programs <- cbind(Adult_Book_Club, Adult_Large_Events,
 Adult_Workshops)

Passive_Adult_Programs <- cbind(Adult_Lectures, Adult_Movies)


                                    #CHILDREN'S PROGRAMS


                                    #LARGE EVENTS

#I Attended
Childrens_Large_Events_Attended <- sample(c("Concert", "Dia de los Muertos",
 "Summer Reading Party", "Harry Potter Night"), 512, replace = T,
             prob = c(0.2496831, 0.2705957, 0.1958175, 0.2839037))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Childrens_Large_Events_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
             prob = c(0.1332160, 0.2852113, 0.0334507, 0.1308685, 0.1977700,
 0.2194836))


#Mon-Sun; Morning, Afternoon, Evening
Childrens_Large_Events_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Childrens_Large_Events_When) <-
 c("Childrens_Large_Events_Day1","Childrens_Large_Events_Day2","Childrens_Large_Ev
 ents_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Childrens_Large_Events_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Homework Help","Gaming","Health/Wellness","Other"), 512, replace = T,
             prob = c(0.14471969, 0.12516297, 0.15254237, 0.18383312, 0.10299870,
 0.03780965, 0.25293351))
```

```
Childrens_Large_Events <- cbind(Childrens_Large_Events_Attended,
 Childrens_Large_Events_How_Hear, Childrens_Large_Events_What_Type,
 Childrens_Large_Events_When)


                                #S.T.E.A.M.


#I Attended
Childrens_STEAM_Attended <- sample(c("Curiosity Club", "Coding Club", "Take It
 Apart Club", "Math Club"), 512, replace = T,
             prob = c(0.3074266, 0.2089810, 0.1761658, 0.3074266))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Childrens_STEAM_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
             prob = c(0.264705882, 0.004010695, 0.117647059, 0.129679144,
 0.225935829, 0.258021390))


#Mon-Sun; Morning, Afternoon, Evening
Childrens_STEAM_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Childrens_STEAM_When) <-
 c("Childrens_STEAM_Day1","Childrens_STEAM_Day2","Childrens_STEAM_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Childrens_STEAM_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
 "Homework Help","Gaming","Health/Wellness","Other"), 512, replace = T,
             prob = c(0.008791209, 0.224175824, 0.190659341, 0.217582418,
 0.106593407, 0.029670330, 0.222527473))


Childrens_STEAM <- cbind(Childrens_STEAM_Attended, Childrens_STEAM_How_Hear,
 Childrens_STEAM_What_Type, Childrens_STEAM_When)


                                #STORYTIME


#I Attended
Childrens_Storytime_Attended <- sample(c("Wiggly Storytime", "Baby and Me
 Storytime", "Family Storytime", "Preschool Storytime", "Bilingual Storytime"),
 512, replace = T,
```

```
            prob = c(0.13742072, 0.40169133, 0.39957717, 0.04439746,
0.01691332))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Childrens_Storytime_How_Hear <- sample(c("Facebook","Word of Mouth","Library
Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
            prob = c(0.25133690, 0.15151515, 0.10160428, 0.06595365, 0.16577540,
0.26381462))


#Mon-Sun; Morning, Afternoon, Evening
Childrens_Storytime_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Childrens_Storytime_When) <-
c("Childrens_Storytime_Day1","Childrens_Storytime_Day2","Childrens_Storytime_Day3
")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
Health/Wellness, Other
Childrens_Storytime_What_Type <-
sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Homework Help","Gaming","Health/Wellness","Other"), 512, replace = T,
            prob = c(0.141095890, 0.005479452, 0.263013699, 0.069863014,
0.239726027, 0.152054795, 0.128767123))


Childrens_Storytime <- cbind(Childrens_Storytime_Attended,
Childrens_Storytime_How_Hear, Childrens_Storytime_What_Type,
Childrens_Storytime_When)


                                    #ARTS/CRAFTS


#I Attended
Childrens_Arts_Crafts_Attended <- sample(c("Paper Airplane Class", "Paint Like
Picasso", "Disney Color Day", "Draw Your Pet", "Birdhouse Builders"), 512,
replace = T,
             prob = c(0.13513514, 0.43488943, 0.01228501, 0.06879607,
0.34889435))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Childrens_Arts_Crafts_How_Hear <- sample(c("Facebook","Word of Mouth","Library
Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
            prob = c(0.150000000, 0.402272727, 0.006818182, 0.027272727,
```

```
0.186363636, 0.227272727))


#Mon-Sun; Morning, Afternoon, Evening
Childrens_Arts_Crafts_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Childrens_Arts_Crafts_When) <-
 c("Childrens_Arts_Crafts_Day1","Childrens_Arts_Crafts_Day2","Childrens_Arts_Craft
 s_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Childrens_Arts_Crafts_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Homework Help","Gaming","Health/Wellness","Other"), 512, replace = T,
               prob = c(0.16393443, 0.06065574, 0.04918033, 0.21967213,
 0.27540984, 0.09016393, 0.14098361))


Childrens_Arts_Crafts <- cbind(Childrens_Arts_Crafts_Attended,
 Childrens_Arts_Crafts_How_Hear, Childrens_Arts_Crafts_What_Type,
 Childrens_Arts_Crafts_When)


                                    #SPEAKERS/PERFORMERS


#I Attended
Childrens_Speakers_Performers_Attended <- sample(c("Puppets with Peter", "Chumash
 Dancers", "Zoo and Pals", "Lessons of the Shoah"), 512, replace = T,
                prob = c(0.3370577, 0.1638734, 0.3351955, 0.1638734))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Childrens_Speakers_Performers_How_Hear <- sample(c("Facebook","Word of
 Mouth","Library Website","Newspaper","In-house Marketing","Other"), 512,replace =
 T,
                prob = c(0.11942446, 0.28776978, 0.13381295, 0.19280576,
 0.18561151, 0.08057554))


#Mon-Sun; Morning, Afternoon, Evening
Childrens_Speakers_Performers_When <- permutations(Days, k = 3, nsample = 512)
 %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Childrens_Speakers_Performers_When) <-
```

```
c("Childrens_Speakers_Performers_Day1","Childrens_Speakers_Performers_Day2","Chil
drens_Speakers_Performers_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Childrens_Speakers_Performers_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
                                          "Homework
Help","Gaming","Health/Wellness","Other"), 512, replace = T,
               prob = c(0.16516517, 0.23873874, 0.28678679, 0.04204204,
0.10960961, 0.12162162, 0.03603604))


Childrens_Speakers_Performers <- cbind(Childrens_Speakers_Performers_Attended,
 Childrens_Speakers_Performers_How_Hear, Childrens_Speakers_Performers_What_Type,
 Childrens_Speakers_Performers_When)


                                    #MOVIES


#I Attended
Childrens_Movies_Attended <- sample(c("Disney Film", "Miyazaki Film", "Comedy",
"Bill Nye Video"), 512, replace = T,
               prob = c(0.40852130, 0.27067669, 0.24561404, 0.07518797))


#Facebook, Word of Mouth, Library Website, Newspaper, In-house marketing, Other
Childrens_Movies_How_Hear <- sample(c("Facebook","Word of Mouth","Library
 Website","Newspaper","In-house Marketing","Other"), 512,replace = T,
              prob = c(0.21747573, 0.05825243, 0.15533981, 0.23883495,
0.21747573, 0.11262136))


#Mon-Sun; Morning, Afternoon, Evening
Childrens_Movies_When <- permutations(Days, k = 3, nsample = 512) %>%
  as_tibble() %>%
  set_names(nm = LETTERS[1:3])
colnames(Childrens_Movies_When) <-
c("Childrens_Movies_Day1","Childrens_Movies_Day2","Childrens_Movies_Day3")


#Arts/Culture, Science/Tech, Crafting/DIY, Business/Finance, Gaming,
 Health/Wellness, Other
Childrens_Movies_What_Type <-
 sample(c("Arts/Culture","Science/Tech","Crafting/DIY",
"Homework Help","Gaming","Health/Wellness","Other"), 512, replace = T,
               prob = c(0.05198358, 0.22571819, 0.25581395, 0.03283174,
```

```
 0.12995896, 0.17783858, 0.12585499))


Childrens_Movies <- cbind(Childrens_Movies_Attended, Childrens_Movies_How_Hear,
 Childrens_Movies_What_Type, Childrens_Movies_When)


                                    #CHILDREN'S PROGRAM AGGREGATION

Childrens_Programs <- cbind(Childrens_Large_Events, Childrens_STEAM,
 Childrens_Storytime, Childrens_Arts_Crafts, Childrens_Speakers_Performers,
 Childrens_Movies)

Childrens_Active <- cbind(Childrens_Large_Events, Childrens_STEAM,
 Childrens_Storytime, Childrens_Arts_Crafts)

Childrens_Passive <- cbind(Childrens_Speakers_Performers, Childrens_Movies)

                                    #FINAL AGGREGATION/EXPORT

df <- cbind(Adult_Programs, Childrens_Programs)
write.csv(df, "df.csv")



                                    #MECHANICS

#Random probability generator
x <- 1:200
y <- sample(x, 18, replace = T)
z <- y/(sum(y))
z
sum(z)
```