R Code Sample

Senior Thesis Data Cleaning

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Overview

Analyzed University housing room assignment algorithm through from a market design perspective and presented findings at Carnegie Mellon's Meeting of the Minds (annual research symposium) as well as Housing Services at an all-staff meeting in May 2019

Raw Data

Source: Carnegie Mellon University Housing Services

- 2017-18 Housing Room Selection Capacity/Occupancy numbers
  - Daily (almost daily) by 25+ residence halls (approx. 3500 bed spaces)
- 2018-19 Housing Room Selection Capacity/Occupancy numbers
  - Daily (almost daily) by 25+ residence halls (approx. 3500 bed spaces)
- 2018 Housing Room Selection survey

Summary Statistics

Capacity/Occupancy

House	Capacity
Boss House	72
Clyde House	24
Doherty Apartments	146
Donner House	241
Fairfax Apartments	403
Hamerschlag House	167
Henderson House	60
The Highlands Apts.	34
Margaret Morrison Apts	112
McGill House	72
Morewood E Tower	209
Morewood Gardens	434
Mudge House	306
Neville Apartments	22
Residence on Fifth	126
Resnik House	151
Roselawn Houses	66
Scobell House	89
Shady Oak Apartments	79
Shirley Apartments	37
Spirit House	12
Stever House	254
Webster Apartments	274
Welch House	56
West Wing	107
Woodlawn Apartments	32

Note:
2018: Total capacity of 3585

Eligible vs Actual Participants of Room Selection

variables	RS.2015	RS.2016	RS.2017	RS.2018
Total Capacity	3499	3588	3597	3585
Capacity for RS	2086	2083	2113	1963
Eligible for RS	3319	3437	3515	NA
Eligible first years	NA	1552	1543	NA
Eligible sophomores	NA	1041	1132	NA
Eligible juniors	NA	706	704	NA
Eligible seniors	NA	138	136	NA
Participated in RS	2004	2075	2056	NA
Participated first years	NA	1006	993	NA
Participated sophomores	NA	600	598	NA
Participated juniors	NA	432	423	NA
Participated seniors	NA	37	42	NA

Note:
NAs representing missing data, data that was either uncollected or unable to get from Housing.

Room Selection participation numbers by Phase

Year	Retention	Block Housing	General Selection	Open Assignment	Total
2014	824	477	625	81	2007
2015	901	492	534	77	2004
2016	848	577	553	100	2078
2017	699	482	644	80	1905
2018	601	626	550	130	1907

Code

```
# 2017-18 data

# Loading 2017-18 capacity/occupancy sheets
library("readxl")
```

```
## Warning: package 'readxl' was built under R version 3.4.4
```

```
sheets <- excel_sheets("~/Desktop/thesisDocuments/1718cap_occup.xlsx")
```

```
## Warning in strptime(x, format, tz = tz): unknown timezone 'zone/tz/2020a.
## 1.0/zoneinfo/America/New_York'
```

```
sheetList <- lapply(sheets,
                    function(x)read_excel("~/Desktop/thesisDocuments/1718cap_occup.xlsx",
                                          range = "A1:P30",
                                          sheet = x))

names(sheetList) <- sheets

# Selecting upperclass houses (rows)
uc_houses_num <- c(2,3,5,7,8,9,11,13,15,16,18,20,21,23,24,25,26,27,29)
sheetNames <- names(sheetList)
uc_list <- list()
for (i in 1:length(sheetNames)) {
  curr_sheet <- sheetList[[sheetNames[i]]]
  if (curr_sheet[21,1] == "Stever House"){
    uc_houses_num <- c(2,3,5,7,8,9,11,13,15,16,18,20,22,23,24,25,26,27)
  } else {
    uc_houses_num <- c(2,3,5,7,8,9,11,13,15,16,18,20,21,23,24,25,26,27)
  }

  cleaned_sheet <- curr_sheet[uc_houses_num,]
  uc_list[[i]] = cleaned_sheet
}
names(uc_list) <- sheets
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Selecting upperclass occupancy/vacancy variables (columns)
sheetNames <- names(uc_list)
for (i in 1:length(sheetNames)){
  curr_sheet <- uc_list[[sheetNames[i]]]
```

```
  cleaned_sheet <- curr_sheet[c(1,4,8,12)]
  uc_list[[i]] = cleaned_sheet
}

names(uc_list) <- sheets
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Computing column totals
sheetNames <- names(uc_list)
for (i in 1:length(sheetNames)){
  curr_sheet <- uc_list[[sheetNames[i]]]
  cleaned_sheet <- rbind(curr_sheet, c("Total", colSums(curr_sheet[-1])))
  colnames(cleaned_sheet) <- c("Building", "Capacity (in beds)", "Actual Occupancy", "Vacancy")
  uc_list[[i]] = cleaned_sheet
}

names(uc_list) <- sheets
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Editing row name wording
sheetNames <- names(uc_list)
# may need to run loop twice for *both* 'Spirit' *and* '5170 MM' to come up
for (i in 1:length(sheetNames)){
  curr_sheet <- uc_list[[sheetNames[i]]]
  cleaned_sheet <- curr_sheet
  if (curr_sheet[12,1] == "Spirit House/Roselawn 15"){
    cleaned_sheet[12,1] = "Spirit House"
  } else if (curr_sheet[13,1] == "Spirit House/5170 MM"){
    cleaned_sheet[13,1] = "5170 MM"
  }
  uc_list[[i]] = cleaned_sheet
}

names(uc_list) <- sheets
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Adjusting 'Building' order
sheetNames <- names(uc_list)
house_order <- c("Clyde House",
                 "Doherty Apartments",
                 "Fairfax Apartments",
                 "Henderson House",
                 "The Highlands Apts.",
                 "Margaret Morrison Apts",
                 "McGill House",
                 "Morewood Gardens",
                 "Neville Apartments",
                 "Resnik House",
                 "Roselawn Houses",
                 "Shady Oak Apartments",
```

```
                  "Spirit House",
                  "Webster Apartments",
                  "Welch House",
                  "West Wing",
                  "Woodlawn Apartments",
                  "5170 MM",
                  "Total")

for (i in 1:length(sheetNames)){
  sheet <- uc_list[[sheetNames[i]]]
  sheet <- sheet[match(house_order, sheet$Building),]
  uc_list[[i]] = sheet
}

names(uc_list)
```

```
##  [1] "Original - 10-26-16"         "4-27-18"
##  [3] "4-6-18"                      "3-9-18"
##  [5] "2-9-18"                      "2-1-18 Feb 1 Report"
##  [7] "1-26-18"                     "1-19-18"
##  [9] "1-12-18"                     "1-5-18"
## [11] "12-1-17"                     "11-17-17"
## [13] "11-10-17"                    "10-27-17"
## [15] "10-20-17"                    "10-13-17"
## [17] "10-2-17 (Oct 1 Rpt)"         "9-22-17"
## [19] "9-15-17"                     "9-8-17"
## [21] "8-29-17"                     "8-25-17"
## [23] "8-19-17 FY Opening"          "8-18-17"
## [25] "8-11-17"                     "7-28-17"
## [27] "7-26-17"                     "7-19-17"
## [29] "7-5-17"                      "6-27-17"
## [31] "6-26-17"                     "6-23-17"
## [33] "6-22-17"                     "6-19-17"
## [35] "6-15-17"                     "6-14-17"
## [37] "6-12-17"                     "6-5-17"
## [39] "5-31-17"                     "5-24-27"
## [41] "5-15-17"                     "5-12-17"
## [43] "5-5-17"                      "4-28-17"
## [45] "4-21-17"                     "4-10-17(aft_open_canc)"
## [47] "4-6-17"                      "3-15-17"
## [49] "am3-13-17(aft_open_b4_canc)" "am3-10-17(aft_day4)"
## [51] "am3-9-17(aft_day3)"          "am3-8-17(aft_day2)"
## [53] "pm3-7-17(aft_day2)"          "am3-7-17(start_day2)"
## [55] "am3-6-17(aft_day1)"          "am3-6-17(start_day1GS)"
## [57] "am3-3-17(aft_day2BH)"        "am3-2-17(aft_day1BH)"
## [59] "3-1-17"                      "am2-28-17(aft_day2PI)"
## [61] "am2-27-27(aft_day1PI)"       "am2-24-17(end_ret)"
```

```
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# removing NA row from 'Original - 10-26-16' sheet
uc_list$`Original - 10-26-16` <- uc_list$`Original - 10-26-16`[c(1:17,19),]
names(uc_list)
```

```
##  [1] "Original - 10-26-16"          "4-27-18"
##  [3] "4-6-18"                       "3-9-18"
##  [5] "2-9-18"                       "2-1-18 Feb 1 Report"
##  [7] "1-26-18"                      "1-19-18"
##  [9] "1-12-18"                      "1-5-18"
## [11] "12-1-17"                      "11-17-17"
## [13] "11-10-17"                     "10-27-17"
## [15] "10-20-17"                     "10-13-17"
## [17] "10-2-17 (Oct 1 Rpt)"          "9-22-17"
## [19] "9-15-17"                      "9-8-17"
## [21] "8-29-17"                      "8-25-17"
## [23] "8-19-17 FY Opening"           "8-18-17"
## [25] "8-11-17"                      "7-28-17"
## [27] "7-26-17"                      "7-19-17"
## [29] "7-5-17"                       "6-27-17"
## [31] "6-26-17"                      "6-23-17"
## [33] "6-22-17"                      "6-19-17"
## [35] "6-15-17"                      "6-14-17"
## [37] "6-12-17"                      "6-5-17"
## [39] "5-31-17"                      "5-24-27"
## [41] "5-15-17"                      "5-12-17"
## [43] "5-5-17"                       "4-28-17"
## [45] "4-21-17"                      "4-10-17(aft_open_canc)"
## [47] "4-6-17"                       "3-15-17"
## [49] "am3-13-17(aft_open_b4_canc)" "am3-10-17(aft_day4)"
## [51] "am3-9-17(aft_day3)"           "am3-8-17(aft_day2)"
## [53] "pm3-7-17(aft_day2)"           "am3-7-17(start_day2)"
## [55] "am3-6-17(aft_day1)"           "am3-6-17(start_day1GS)"
## [57] "am3-3-17(aft_day2BH)"         "am3-2-17(aft_day1BH)"
## [59] "3-1-17"                       "am2-28-17(aft_day2PI)"
## [61] "am2-27-27(aft_day1PI)"        "am2-24-17(end_ret)"
```

```
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# reodering 'Original - 10-26-16' from position 1 to position 62
uc_list <- c(uc_list[-1],uc_list[1])
names(uc_list)
```

```
##  [1] "4-27-18"                      "4-6-18"
##  [3] "3-9-18"                       "2-9-18"
##  [5] "2-1-18 Feb 1 Report"          "1-26-18"
##  [7] "1-19-18"                      "1-12-18"
##  [9] "1-5-18"                       "12-1-17"
## [11] "11-17-17"                     "11-10-17"
## [13] "10-27-17"                     "10-20-17"
## [15] "10-13-17"                     "10-2-17 (Oct 1 Rpt)"
## [17] "9-22-17"                      "9-15-17"
## [19] "9-8-17"                       "8-29-17"
## [21] "8-25-17"                      "8-19-17 FY Opening"
## [23] "8-18-17"                      "8-11-17"
## [25] "7-28-17"                      "7-26-17"
## [27] "7-19-17"                      "7-5-17"
## [29] "6-27-17"                      "6-26-17"
```

```
## [31] "6-23-17"                     "6-22-17"
## [33] "6-19-17"                     "6-15-17"
## [35] "6-14-17"                     "6-12-17"
## [37] "6-5-17"                      "5-31-17"
## [39] "5-24-27"                     "5-15-17"
## [41] "5-12-17"                     "5-5-17"
## [43] "4-28-17"                     "4-21-17"
## [45] "4-10-17(aft_open_canc)"      "4-6-17"
## [47] "3-15-17"                     "am3-13-17(aft_open_b4_canc)"
## [49] "am3-10-17(aft_day4)"         "am3-9-17(aft_day3)"
## [51] "am3-8-17(aft_day2)"          "pm3-7-17(aft_day2)"
## [53] "am3-7-17(start_day2)"        "am3-6-17(aft_day1)"
## [55] "am3-6-17(start_day1GS)"      "am3-3-17(aft_day2BH)"
## [57] "am3-2-17(aft_day1BH)"        "3-1-17"
## [59] "am2-28-17(aft_day2PI)"       "am2-27-27(aft_day1PI)"
## [61] "am2-24-17(end_ret)"          "Original - 10-26-16"
```

```
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# removing inaccurate "total" row from 'Original - 10-26-16' sheet
uc_list[[62]] <- uc_list[[62]][-c(18),]
curr_sheet <- uc_list[[62]]
names(uc_list)
```

```
##  [1] "4-27-18"                  "4-6-18"
##  [3] "3-9-18"                   "2-9-18"
##  [5] "2-1-18 Feb 1 Report"      "1-26-18"
##  [7] "1-19-18"                  "1-12-18"
##  [9] "1-5-18"                   "12-1-17"
## [11] "11-17-17"                 "11-10-17"
## [13] "10-27-17"                 "10-20-17"
## [15] "10-13-17"                 "10-2-17 (Oct 1 Rpt)"
## [17] "9-22-17"                  "9-15-17"
## [19] "9-8-17"                   "8-29-17"
## [21] "8-25-17"                  "8-19-17 FY Opening"
## [23] "8-18-17"                  "8-11-17"
## [25] "7-28-17"                  "7-26-17"
## [27] "7-19-17"                  "7-5-17"
## [29] "6-27-17"                  "6-26-17"
## [31] "6-23-17"                  "6-22-17"
## [33] "6-19-17"                  "6-15-17"
## [35] "6-14-17"                  "6-12-17"
## [37] "6-5-17"                   "5-31-17"
## [39] "5-24-27"                  "5-15-17"
## [41] "5-12-17"                  "5-5-17"
## [43] "4-28-17"                  "4-21-17"
## [45] "4-10-17(aft_open_canc)"   "4-6-17"
## [47] "3-15-17"                  "am3-13-17(aft_open_b4_canc)"
## [49] "am3-10-17(aft_day4)"      "am3-9-17(aft_day3)"
## [51] "am3-8-17(aft_day2)"       "pm3-7-17(aft_day2)"
## [53] "am3-7-17(start_day2)"     "am3-6-17(aft_day1)"
## [55] "am3-6-17(start_day1GS)"   "am3-3-17(aft_day2BH)"
## [57] "am3-2-17(aft_day1BH)"     "3-1-17"
```

```
## [59] "am2-28-17(aft_day2PI)"       "am2-27-27(aft_day1PI)"
## [61] "am2-24-17(end_ret)"          "Original - 10-26-16"
```

```
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# recalculating "total" for 'Original - 10-26-16' sheet
curr_sheet <- uc_list[[62]]
curr_sheet2 = curr_sheet[[1]]
curr_sheet2 = as.data.frame(matrix(nrow=length(curr_sheet2), ncol=4))
curr_sheet2$Building = curr_sheet[[1]]
curr_sheet2$Capacity = as.numeric(curr_sheet[[2]])
curr_sheet2$Occ = as.numeric(curr_sheet[[3]])
curr_sheet2$Vac = as.numeric(curr_sheet[[4]])

curr_sheet2 = curr_sheet2[,-(1:4)]
colnames(curr_sheet2) = colnames(curr_sheet)
cleaned_sheet <- rbind(curr_sheet, c("Total", colSums(curr_sheet2[-1])))
uc_list[[62]] = cleaned_sheet

names(uc_list)
```

```
##  [1] "4-27-18"                  "4-6-18"
##  [3] "3-9-18"                   "2-9-18"
##  [5] "2-1-18 Feb 1 Report"      "1-26-18"
##  [7] "1-19-18"                  "1-12-18"
##  [9] "1-5-18"                   "12-1-17"
## [11] "11-17-17"                 "11-10-17"
## [13] "10-27-17"                 "10-20-17"
## [15] "10-13-17"                 "10-2-17 (Oct 1 Rpt)"
## [17] "9-22-17"                  "9-15-17"
## [19] "9-8-17"                   "8-29-17"
## [21] "8-25-17"                  "8-19-17 FY Opening"
## [23] "8-18-17"                  "8-11-17"
## [25] "7-28-17"                  "7-26-17"
## [27] "7-19-17"                  "7-5-17"
## [29] "6-27-17"                  "6-26-17"
## [31] "6-23-17"                  "6-22-17"
## [33] "6-19-17"                  "6-15-17"
## [35] "6-14-17"                  "6-12-17"
## [37] "6-5-17"                   "5-31-17"
## [39] "5-24-27"                  "5-15-17"
## [41] "5-12-17"                  "5-5-17"
## [43] "4-28-17"                  "4-21-17"
## [45] "4-10-17(aft_open_canc)"   "4-6-17"
## [47] "3-15-17"                  "am3-13-17(aft_open_b4_canc)"
## [49] "am3-10-17(aft_day4)"      "am3-9-17(aft_day3)"
## [51] "am3-8-17(aft_day2)"       "pm3-7-17(aft_day2)"
## [53] "am3-7-17(start_day2)"     "am3-6-17(aft_day1)"
## [55] "am3-6-17(start_day1GS)"   "am3-3-17(aft_day2BH)"
## [57] "am3-2-17(aft_day1BH)"     "3-1-17"
## [59] "am2-28-17(aft_day2PI)"    "am2-27-27(aft_day1PI)"
## [61] "am2-24-17(end_ret)"       "Original - 10-26-16"
```

```
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# reorder dataframes by chronological order
library(rlist)
uc_list <- list.reverse(uc_list)
names(uc_list)
```

```
##  [1] "Original - 10-26-16"          "am2-24-17(end_ret)"
##  [3] "am2-27-27(aft_day1PI)"        "am2-28-17(aft_day2PI)"
##  [5] "3-1-17"                       "am3-2-17(aft_day1BH)"
##  [7] "am3-3-17(aft_day2BH)"         "am3-6-17(start_day1GS)"
##  [9] "am3-6-17(aft_day1)"           "am3-7-17(start_day2)"
## [11] "pm3-7-17(aft_day2)"           "am3-8-17(aft_day2)"
## [13] "am3-9-17(aft_day3)"           "am3-10-17(aft_day4)"
## [15] "am3-13-17(aft_open_b4_canc)" "3-15-17"
## [17] "4-6-17"                       "4-10-17(aft_open_canc)"
## [19] "4-21-17"                      "4-28-17"
## [21] "5-5-17"                       "5-12-17"
## [23] "5-15-17"                      "5-24-27"
## [25] "5-31-17"                      "6-5-17"
## [27] "6-12-17"                      "6-14-17"
## [29] "6-15-17"                      "6-19-17"
## [31] "6-22-17"                      "6-23-17"
## [33] "6-26-17"                      "6-27-17"
## [35] "7-5-17"                       "7-19-17"
## [37] "7-26-17"                      "7-28-17"
## [39] "8-11-17"                      "8-18-17"
## [41] "8-19-17 FY Opening"           "8-25-17"
## [43] "8-29-17"                      "9-8-17"
## [45] "9-15-17"                      "9-22-17"
## [47] "10-2-17 (Oct 1 Rpt)"          "10-13-17"
## [49] "10-20-17"                     "10-27-17"
## [51] "11-10-17"                     "11-17-17"
## [53] "12-1-17"                      "1-5-18"
## [55] "1-12-18"                      "1-19-18"
## [57] "1-26-18"                      "2-1-18 Feb 1 Report"
## [59] "2-9-18"                       "3-9-18"
## [61] "4-6-18"                       "4-27-18"
```

```
list2env(uc_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# 2018-19 data

# Loading 2018-19 capacity/occupancy sheets
sheets1 <- excel_sheets("~/Desktop/thesisDocuments/1819cap_occup.xlsx")
sheetList1 <- lapply(sheets1,
                     function(x)read_excel("~/Desktop/thesisDocuments/1819cap_occup.xlsx",
                                           range = "A1:P30",
                                           sheet = x))
names(sheetList1) <- sheets1

# Selecting upperclass houses (rows)
```

```
sheetNames <- names(sheetList1)
uc_list1 <- list()
for (i in 1:length(sheetNames)) {
  curr_sheet <- sheetList1[[sheetNames[i]]]
  if (curr_sheet[17,1] == "Scobell House"){
    uc_houses_num <- c(2,3,5,7,8,9,11,13,15,16,18,20,21,23,24,25,26,27)
  } else {
    uc_houses_num <- c(2,3,5,7,8,9,10,12,14,16,17,18,20,22,24,25,26,27)
  }
  cleaned_sheet <- curr_sheet[uc_houses_num,]
  uc_list1[[i]] = cleaned_sheet
}

names(uc_list1) <- sheets1
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Selecting upperclass occupancy/vacancy variables (columns)
sheetNames <- names(uc_list1)
for (i in 1:length(sheetNames)){
  curr_sheet <- uc_list1[[sheetNames[i]]]
  cleaned_sheet <- curr_sheet[c(1,4,8,12)]
  uc_list1[[i]] = cleaned_sheet
}

names(uc_list1) <- sheets1
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Computing column totals
sheetNames <- names(uc_list1)
for (i in 1:length(sheetNames)){
  curr_sheet <- uc_list1[[sheetNames[i]]]

  curr_sheet2 = curr_sheet[[1]]
  curr_sheet2 = as.data.frame(matrix(nrow=length(curr_sheet2), ncol=4))
  curr_sheet2$Building = curr_sheet[[1]]
  curr_sheet2$Capacity = as.numeric(curr_sheet[[2]])
  curr_sheet2$Occ = as.numeric(curr_sheet[[3]])
  curr_sheet2$Vac = as.numeric(curr_sheet[[4]])

  curr_sheet2 = curr_sheet2[,-(1:4)]
  colnames(curr_sheet2) = colnames(curr_sheet)

  cleaned_sheet <- rbind(curr_sheet, c("Total", colSums(curr_sheet2[-1])))
  colnames(cleaned_sheet) <- c("Building", "Capacity (in beds)", "Actual Occupancy", "Vacancy")
  uc_list1[[i]] = cleaned_sheet
}
```

```
## Warning: NAs introduced by coercion
```

```
names(uc_list1) <- sheets1
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Editing row name wording
sheetNames <- names(uc_list1)
# may need to run loop twice for *both* 'Spirit' *and* '5170 MM' to come up
for (i in 1:length(sheetNames)){
  curr_sheet <- uc_list1[[sheetNames[i]]]
  cleaned_sheet <- curr_sheet
  if (curr_sheet[11,1] == "Roselawn 15/Old Spirit"){
    cleaned_sheet[11,1] = "Spirit House"
  } else if (curr_sheet[12,1] == "Spirit House/Roselawn 15"){
    cleaned_sheet[12,1] = "Spirit House"
  } else if (curr_sheet[14,1] == "Spirit House/5170 MM"){
    cleaned_sheet[14,1] = "5170 MM"
  } else if (curr_sheet[13,1] == "Spirit House/5170 MM"){
    cleaned_sheet[13,1] = "5170 MM"
  }
  uc_list1[[i]] = cleaned_sheet
}

names(uc_list1) <- sheets1
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# Adjusting 'Building' order
sheetNames <- names(uc_list1)
house_order <- c("Clyde House",
                 "Doherty Apartments",
                 "Fairfax Apartments",
                 "Henderson House",
                 "The Highlands Apts.",
                 "Margaret Morrison Apts",
                 "McGill House",
                 "Morewood Gardens",
                 "Neville Apartments",
                 "Resnik House",
                 "Roselawn Houses",
                 "Shady Oak Apartments",
                 "Spirit House",
                 "Webster Apartments",
                 "Welch House",
                 "West Wing",
                 "Woodlawn Apartments",
                 "5170 MM",
                 "Total")

for (i in 1:length(sheetNames)){
  sheet <- uc_list1[[sheetNames[i]]]
  sheet <- sheet[match(house_order, sheet$Building),]
  uc_list1[[i]] = sheet
}

names(uc_list1)
```

```
##  [1] "11-16-18"                "11-9-18"
```

```
##  [3] "11-2-18"                "10-26-18"
##  [5] "10-19-18"               "10-12-18"
##  [7] "10-5-18"                "10-1-18 Oct. 1"
##  [9] "9-28-18"                "9-21-18"
## [11] "9-14-18"                "9-7-18"
## [13] "8-31-18"                "8-24-18"
## [15] "8-18-18 FY Opening"     "8-17-18"
## [17] "8-10-18"                "8-3-18"
## [19] "7-31-18"                "7-27-18"
## [21] "7-24-18"                "7-20-18"
## [23] "7-13-18"                "7-6-18"
## [25] "6-29-18"                "6-22-18"
## [27] "6-18-18"                "6-15-18"
## [29] "6-8-18"                 "6-1-18"
## [31] "5-23-18"                "5-18-18"
## [33] "5-9-18"                 "4-27-18"
## [35] "4-20-18"                "4-13-18"
## [37] "4-6-18"                 "3-16-18"
## [39] "3-9-18 final stats"     "am3-8-18(aft_day3)"
## [41] "am3-7-18(aft_day2)"     "am3-6-18(aft_day1)"
## [43] "am3-5-18(day1GS)"       "3-2-18(aft_day2)"
## [45] "3-1-18(aft_day1BH)"     "2-28-18(aft_day2PI)"
## [47] "2-27-18(aft_day2PI)"    "2-26-18(aft_ret_day1PI)"
## [49] "2-23-18(day2RS)"        "2-22-18(day2RS)"
## [51] "2-21-18(day1RS)"        "F18 Prop. 6(2-06-18)"
## [53] "F18 Prop. 5(11-21-17)"  "F18 Prop. 4(11-21-17)"
## [55] "F18 Prop. 3(10-30-17)"  "F18 Prop.2"
## [57] "F18 Prop.1"             "Fall 2017 Base(9-06-17)"
```

```
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# removing '2-21-18(day1RS)' and '2-22-18(day2RS)' sheets from general list
uc_list1 <- uc_list1[-c(51,52)]
names(uc_list1)
```

```
##  [1] "11-16-18"               "11-9-18"
##  [3] "11-2-18"                "10-26-18"
##  [5] "10-19-18"               "10-12-18"
##  [7] "10-5-18"                "10-1-18 Oct. 1"
##  [9] "9-28-18"                "9-21-18"
## [11] "9-14-18"                "9-7-18"
## [13] "8-31-18"                "8-24-18"
## [15] "8-18-18 FY Opening"     "8-17-18"
## [17] "8-10-18"                "8-3-18"
## [19] "7-31-18"                "7-27-18"
## [21] "7-24-18"                "7-20-18"
## [23] "7-13-18"                "7-6-18"
## [25] "6-29-18"                "6-22-18"
## [27] "6-18-18"                "6-15-18"
## [29] "6-8-18"                 "6-1-18"
## [31] "5-23-18"                "5-18-18"
## [33] "5-9-18"                 "4-27-18"
## [35] "4-20-18"                "4-13-18"
```

```
## [37] "4-6-18"                  "3-16-18"
## [39] "3-9-18 final stats"      "am3-8-18(aft_day3)"
## [41] "am3-7-18(aft_day2)"      "am3-6-18(aft_day1)"
## [43] "am3-5-18(day1GS)"        "3-2-18(aft_day2)"
## [45] "3-1-18(aft_day1BH)"      "2-28-18(aft_day2PI)"
## [47] "2-27-18(aft_day2PI)"     "2-26-18(aft_ret_day1PI)"
## [49] "2-23-18(day2RS)"         "2-22-18(day2RS)"
## [51] "F18 Prop. 5(11-21-17)"   "F18 Prop. 4(11-21-17)"
## [53] "F18 Prop. 3(10-30-17)"   "F18 Prop.2"
## [55] "F18 Prop.1"              "Fall 2017 Base(9-06-17)"
```

```
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# create separate list for the "proposed" sheets
proposed_list <- uc_list1[c(50:55)]
names(proposed_list)
```

```
## [1] "2-22-18(day2RS)"       "F18 Prop. 5(11-21-17)" "F18 Prop. 4(11-21-17)"
## [4] "F18 Prop. 3(10-30-17)" "F18 Prop.2"            "F18 Prop.1"
```

```
list2env(proposed_list,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```

```
# removing "proposed" sheets from general list and reordering dataframes by chronological order
uc_list1 <- uc_list1[-c(50:55)]
uc_list1 <- list.reverse(uc_list1)
names(uc_list1)
```

```
##  [1] "Fall 2017 Base(9-06-17)" "2-23-18(day2RS)"
##  [3] "2-26-18(aft_ret_day1PI)" "2-27-18(aft_day2PI)"
##  [5] "2-28-18(aft_day2PI)"     "3-1-18(aft_day1BH)"
##  [7] "3-2-18(aft_day2)"        "am3-5-18(day1GS)"
##  [9] "am3-6-18(aft_day1)"      "am3-7-18(aft_day2)"
## [11] "am3-8-18(aft_day3)"      "3-9-18 final stats"
## [13] "3-16-18"                 "4-6-18"
## [15] "4-13-18"                 "4-20-18"
## [17] "4-27-18"                 "5-9-18"
## [19] "5-18-18"                 "5-23-18"
## [21] "6-1-18"                  "6-8-18"
## [23] "6-15-18"                 "6-18-18"
## [25] "6-22-18"                 "6-29-18"
## [27] "7-6-18"                  "7-13-18"
## [29] "7-20-18"                 "7-24-18"
## [31] "7-27-18"                 "7-31-18"
## [33] "8-3-18"                  "8-10-18"
## [35] "8-17-18"                 "8-18-18 FY Opening"
## [37] "8-24-18"                 "8-31-18"
## [39] "9-7-18"                  "9-14-18"
## [41] "9-21-18"                 "9-28-18"
## [43] "10-1-18 Oct. 1"          "10-5-18"
## [45] "10-12-18"                "10-19-18"
## [47] "10-26-18"                "11-2-18"
## [49] "11-9-18"                 "11-16-18"
```

```r
list2env(uc_list1,.GlobalEnv)
```

```
## <environment: R_GlobalEnv>
```