

# Joy Of Cooking Midterm Project Prep

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*6/25/2018*

## Part 1 - Assign Recipes

First, generate a list of all files in the Recipes folder.

```
recipes <- list.files(path = "../data/Recipes", pattern = '*.pdf')
```

Make this reproducible.

```
set.seed(10010)
```

Create two randomly sampled list of recipe files and cycle this list through 80 rows

```
recipe.pairs <- matrix(c(sample(recipes),sample(recipes)),ncol=2,nrow=80)
```

```
## Warning in matrix(c(sample(recipes), sample(recipes)), ncol = 2, nrow =  
## 80): data length [214] is not a sub-multiple or multiple of the number of  
## rows [80]
```

Are there any pairs across rows?

```
sum(recipe.pairs[,1]==recipe.pairs[,2])
```

```
## [1] 0
```

Write to a table

```
write.csv(recipe.pairs, file="Recipe.Table.csv",row.names = FALSE)
```

Read the table in and print:

```
Recipe.Table <- read.csv("Recipe.Table.csv",header=FALSE,skip=1)  
print(Recipe.Table)
```

```
##                               V1  
## 1          Brownies Cockaigne.pdf  
## 2      Twice-Baked Potatoes.pdf  
## 3      Lima Beans and Mushrooms.pdf  
## 4      Chantilly Potatoes.pdf  
## 5  Ham Cakes with Pineapple and Sweet Potatoes.pdf  
## 6          Bacon Cornmeal Waffles.pdf  
## 7      Baked Pearl Tapioca Pudding.pdf  
## 8      Sauteed Summer Squash.pdf  
## 9          Chocolate Souffle.pdf  
## 10         Pineapple Gelatin.pdf  
## 11         Blueberry Muffins.pdf  
## 12          Curried Eggs.pdf  
## 13          Apple Pie.pdf  
## 14         Molded Custard.pdf  
## 15         Boiled Custard.pdf  
## 16      Sticky Toffee Pudding.pdf  
## 17  Sour Cream Apple Cake Souffle Cockaigne.pdf  
## 18         Eggs in a Nest.pdf
```

## 19 Chicken a la King.pdf  
 ## 20 Farina Pudding.pdf  
 ## 21 Mushroom Souffle.pdf  
 ## 22 Shrimp Wiggle.pdf  
 ## 23 Creamed Chicken.pdf  
 ## 24 Green Bean Casserole.pdf  
 ## 25 Mashed Potatoes.pdf  
 ## 26 Steamed Caramel Pudding.pdf  
 ## 27 Chicken Salad.pdf  
 ## 28 Lemon Souffle.pdf  
 ## 29 Pineapple Snow.pdf  
 ## 30 Chili with Meat and Beans.pdf  
 ## 31 Steamed Plum Pudding.pdf  
 ## 32 Chicken Gumbo.pdf  
 ## 33 German Potato Salad.pdf  
 ## 34 Scalloped Oysters.pdf  
 ## 35 Scalloped Cauliflower.pdf  
 ## 36 Souffled Omelet.pdf  
 ## 37 Sweet-and-Sour Brisket.pdf  
 ## 38 Fruit and Berry Cobbler.pdf  
 ## 39 Apple Dumplings.pdf  
 ## 40 Chocolate Cake.pdf  
 ## 41 Caramel Custard.pdf  
 ## 42 Sauerbrauten.pdf  
 ## 43 Creamed Oysters.pdf  
 ## 44 Gnocchi.pdf  
 ## 45 Mushroom Timbales.pdf  
 ## 46 Hot Slaw.pdf  
 ## 47 Chocolate Bavarian Cream.pdf  
 ## 48 Stovetop Rice Pudding.pdf  
 ## 49 Moussaka.pdf  
 ## 50 Cucumber Mousse.pdf  
 ## 51 Tomato Aspic.pdf  
 ## 52 Lobster Mousse.pdf  
 ## 53 Meat Loaf.pdf  
 ## 54 Leftover Potatoes OBrien.pdf  
 ## 55 Corn Bread Tamale Pie.pdf  
 ## 56 Seafood Salad.pdf  
 ## 57 Tomato Juice.pdf  
 ## 58 Welsh Rarebit.pdf  
 ## 59 Pineapple-Grapefruit Juice.pdf  
 ## 60 Shepherd's Pie.pdf  
 ## 61 Vanilla Souffle.pdf  
 ## 62 Swiss Steak.pdf  
 ## 63 Orange Gelatin.pdf  
 ## 64 Rote Grutze.pdf  
 ## 65 Creamed Eggs with Asparagus Tips Cockaigne.pdf  
 ## 66 Sukiyaki.pdf  
 ## 67 Tapioca Custard.pdf  
 ## 68 Lobster or Shrimp Salad.pdf  
 ## 69 Corn Chowder.pdf  
 ## 70 Apple Tartlets.pdf  
 ## 71 Coffee Bavarian Cream.pdf  
 ## 72 Cheese Souffle Cockaigne.pdf

## 73 Braised Red Cabbage.pdf  
 ## 74 Corn Bread Muffins.pdf  
 ## 75 Rombauer Italian Rice.pdf  
 ## 76 Waldorf Salad.pdf  
 ## 77 Chicken Jambalaya.pdf  
 ## 78 Old-Fashioned Chocolate Pudding.pdf  
 ## 79 Sugar Drop Cookies.pdf  
 ## 80 Ham and Cheese Souffle.pdf  
 ## V2  
 ## 1 Sweet Potato Souffle.pdf  
 ## 2 Flank Steak with Dressing.pdf  
 ## 3 Charlotte Russe.pdf  
 ## 4 Cottage Pudding.pdf  
 ## 5 Ham Loaf.pdf  
 ## 6 Steamed Chocolate Feather Pudding.pdf  
 ## 7 Baked Rice Pudding.pdf  
 ## 8 Chow Mein.pdf  
 ## 9 Stovetop Macaroni and Cheese.pdf  
 ## 10 Rolled Biscuits.pdf  
 ## 11 White Veal Stew.pdf  
 ## 12 Creamed Spinach.pdf  
 ## 13 Sweet-and-Sour Beets.pdf  
 ## 14 Chocolate Charlotte.pdf  
 ## 15 Broccoli Timbales.pdf  
 ## 16 Golden Glow Salad.pdf  
 ## 17 Baked Macaroni and Cheese.pdf  
 ## 18 Scalloped Potatoes.pdf  
 ## 19 Bread Pudding.pdf  
 ## 20 Irish Stew.pdf  
 ## 21 Hungarian Goulash.pdf  
 ## 22 Bavarian Berry Cream.pdf  
 ## 23 Herring Salad.pdf  
 ## 24 Asparagus Timbales.pdf  
 ## 25 Tuna Salad.pdf  
 ## 26 Lobster Newburg.pdf  
 ## 27 Brussels Sprouts with Chestnuts.pdf  
 ## 28 Lobster or Shrimp Salad.pdf  
 ## 29 Coffee Bavarian Cream.pdf  
 ## 30 Caramel Custard.pdf  
 ## 31 Welsh Rarebit.pdf  
 ## 32 Chocolate Bavarian Cream.pdf  
 ## 33 Irish Stew.pdf  
 ## 34 Cottage Pudding.pdf  
 ## 35 Blueberry Muffins.pdf  
 ## 36 Eggs in a Nest.pdf  
 ## 37 Hot Slaw.pdf  
 ## 38 Tapioca Custard.pdf  
 ## 39 Scalloped Oysters.pdf  
 ## 40 Chicken Jambalaya.pdf  
 ## 41 Meat Loaf.pdf  
 ## 42 Apple Dumplings.pdf  
 ## 43 Bavarian Berry Cream.pdf  
 ## 44 Chow Mein.pdf  
 ## 45 Lima Beans and Mushrooms.pdf

```

## 46                Tomato Aspic.pdf
## 47                Sugar Drop Cookies.pdf
## 48                Leftover Potatoes OBrien.pdf
## 49                Chicken Salad.pdf
## 50                Sukiyaki.pdf
## 51                Charlotte Russe.pdf
## 52                Vanilla Souffle.pdf
## 53                Mushroom Souffle.pdf
## 54                Farina Pudding.pdf
## 55                Brussels Sprouts with Chestnuts.pdf
## 56 Creamed Eggs with Asparagus Tips Cockaigne.pdf
## 57                Braised Red Cabbage.pdf
## 58                Stovetop Rice Pudding.pdf
## 59                Molded Custard.pdf
## 60                Hungarian Goulash.pdf
## 61                Cheese Souffle Cockaigne.pdf
## 62                Scalloped Cauliflower.pdf
## 63                Rolled Biscuits.pdf
## 64                Tomato Juice.pdf
## 65                Sticky Toffee Pudding.pdf
## 66                Herring Salad.pdf
## 67                Pineapple-Grapefruit Juice.pdf
## 68                Sweet Potato Souffle.pdf
## 69                Green Bean Casserole.pdf
## 70                Creamed Oysters.pdf
## 71                Ham and Cheese Souffle.pdf
## 72 Sour Cream Apple Cake Souffle Cockaigne.pdf
## 73                Pineapple Gelatin.pdf
## 74                Rote Grutze.pdf
## 75                Baked Rice Pudding.pdf
## 76                Stovetop Macaroni and Cheese.pdf
## 77                German Potato Salad.pdf
## 78                Steamed Chocolate Feather Pudding.pdf
## 79                Steamed Caramel Pudding.pdf
## 80                Chocolate Souffle.pdf

```

## Part 2 - Check Nutrient Data.

We will be using a modified version of the USDA food nutrient database, found at <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/nutrient-data-laboratory/docs/usda-national-nutrient-database-for-standard-reference/>

Run this to make sure your system can read the required nutrient database tables.

```

weight.dat <- read.table("../data/SR-Leg_ASC/WEIGHT.txt",header=FALSE,sep="^",quote="~")
names(weight.dat) <- c("NDB_No","Seq","Amount","Msre_Desc","Gm_Wgt","Num_Data_Pts","Std_Dev")
head(weight.dat)

```

##	NDB_No	Seq	Amount	Msre_Desc	Gm_Wgt	Num_Data_Pts	Std_Dev
## 1	1001	1	1 pat (1" sq, 1/3" high)		5.0	NA	NA
## 2	1001	2	1	tbsp	14.2	NA	NA
## 3	1001	3	1	cup	227.0	NA	NA
## 4	1001	4	1	stick	113.0	NA	NA
## 5	1002	1	1 pat (1" sq, 1/3" high)		3.8	NA	NA

```
## 6    1002    2      1                tbsp    9.4                NA      NA
```

```
summary(weight.dat)
```

```
##      NDB_No      Seq      Amount      Msre_Desc
## Min.   : 1001   Min.   : 0.00   Min.   : 0.000   oz      :3166
## 1st Qu.: 8709   1st Qu.: 1.00   1st Qu.: 1.000   cup     :1691
## Median :13887   Median : 1.00   Median : 1.000   tbsp    : 548
## Mean   :14394   Mean    : 1.78   Mean    : 1.615   fl oz   : 492
## 3rd Qu.:18959   3rd Qu.: 2.00   3rd Qu.: 1.000   lb      : 281
## Max.   :93600   Max.    :16.00   Max.    :240.000   steak   : 280
##                                     (Other):7991
##      Gm_Wgt      Num_Data_Pts      Std_Dev
## Min.   : 0.1     Min.   : 0.00   Min.   : 0.00
## 1st Qu.: 30.5     1st Qu.: 1.00   1st Qu.: 4.76
## Median : 90.0     Median : 9.00   Median : 15.51
## Mean   : 161.6     Mean    : 17.58   Mean    : 53.87
## 3rd Qu.: 188.0     3rd Qu.: 20.00   3rd Qu.: 40.62
## Max.   :5717.0     Max.    :1587.00   Max.    :1687.58
##                                     NA's    :10905   NA's    :12344
```

```
food_des.dat <- read.table("../data/SR-Leg_ASC/FOOD_DES.txt",header=FALSE,sep="^",quote="~")
names(food_des.dat) <- c("NDB_No", "FdGrp_Cd", "Long_Desc", "Shrt_Desc",
"ComName", "ManufacName", "Survey", "Ref_desc", "Refuse", "SciName",
"N_Factor", "Pro_Factor", "Fat_Factor", "CHO_Factor")
dim(food_des.dat)
```

```
## [1] 7793    14
```

```
head(food_des.dat)
```

```
##      NDB_No FdGrp_Cd      Long_Desc      Shrt_Desc
## 1    1001      100      Butter, salted      BUTTER,WITH SALT
## 2    1002      100 Butter, whipped, with salt BUTTER,WHIPPED,W/ SALT
## 3    1003      100      Butter oil, anhydrous      BUTTER OIL,ANHYDROUS
## 4    1004      100      Cheese, blue      CHEESE,BLUE
## 5    1005      100      Cheese, brick      CHEESE,BRICK
## 6    1006      100      Cheese, brie      CHEESE,BRIE
##      ComName ManufacName Survey Ref_desc Refuse SciName N_Factor Pro_Factor
## 1              Y              0          6.38      4.27
## 2              Y              0          6.38      NA
## 3              Y              0          6.38      4.27
## 4              Y              0          6.38      4.27
## 5              Y              0          6.38      4.27
## 6              Y              0          6.38      4.27
##      Fat_Factor CHO_Factor
## 1          8.79      3.87
## 2           NA          NA
## 3          8.79      3.87
## 4          8.79      3.87
## 5          8.79      3.87
## 6          8.79      3.87
```

```
summary(food_des.dat)
```

```
##      NDB_No      FdGrp_Cd
## Min.   : 1001   Min.   : 100
```

```

## 1st Qu.: 9254    1st Qu.: 900
## Median :14226    Median :1300
## Mean   :15382    Mean   :1306
## 3rd Qu.:19703    3rd Qu.:1700
## Max.   :93600    Max.   :3600
##
##
##                                     Long_Desc
## APPLEBEE'S, 9 oz house sirloin steak           : 1
## APPLEBEE'S, Double Crunch Shrimp                : 1
## APPLEBEE'S, KRAFT, Macaroni & Cheese, from kid's menu: 1
## APPLEBEE'S, chicken tenders platter             : 1
## APPLEBEE'S, chicken tenders, from kids' menu    : 1
## APPLEBEE'S, chili                               : 1
## (Other)                                         :7787
##
##                                     Shrt_Desc
## BEEF,CHUCK,UNDER BLADE CNTR STEAK,BNLESS,DENVER CUT,LN,0" FA: 2
## OIL,INDUSTRIAL,PALM KERNEL (HYDROGENATED),CONFECTION FAT : 2
## POPCORN,OIL-POPPED,LOFAT                        : 2
## ABALONE,MIXED SPECIES,RAW                       : 1
## ABALONE,MXD SP,CKD,FRIED                       : 1
## ABIYUCH,RAW                                     : 1
## (Other)                                         :7784
##
## ComName                               ManufacName   Survey
## :6723                                :6840         :4563
## hamburger : 32 The Quaker Oats, Co. : 71 Y:3230
## KFC       : 22 MEAD JOHNSON         : 51
## family style: 21 McDonald's Corporation: 46
## Sweetpotato : 13 Masterfoods USA     : 38
## buffalo    : 13 Hershey Food Corp.   : 32
## (Other)    : 969 (Other)             : 715
##
## Ref_desc                               Refuse
## :5823 Min. : 0.000
## Bone : 268 1st Qu.: 0.000
## Bone and connective tissue: 72 Median : 0.000
## Connective tissue : 52 Mean : 5.597
## Connective tissue 1% : 46 3rd Qu.: 1.000
## Connective tissue 6% : 36 Max. :81.000
## (Other) :1496 NA's :42
##
## SciName                               N_Factor       Pro_Factor
## :7057 Min. :0.000 Min. :0.000
## Phaseolus vulgaris : 20 1st Qu.:6.250 1st Qu.:3.360
## Struthio camelus : 18 Median :6.250 Median :4.000
## Bison bison : 15 Mean :5.992 Mean :3.689
## Bos taurus : 12 3rd Qu.:6.250 3rd Qu.:4.270
## Dromaius novaehollandiae: 12 Max. :6.930 Max. :4.360
## (Other) : 659 NA's :1716 NA's :3210
##
## Fat_Factor CHO_Factor
## Min. :0.000 Min. :0.000
## 1st Qu.:8.370 1st Qu.:3.840
## Median :8.800 Median :3.870
## Mean :8.688 Mean :3.848
## 3rd Qu.:9.020 3rd Qu.:4.000
## Max. :9.040 Max. :4.400
## NA's :3115 NA's :3217

```

```
nut_data.dat <- read.table("../data/SR-Leg_ASC/NUT_DATA.txt",header=FALSE,sep="^",quote="~")
names(nut_data.dat) <- c("NDB_No","Nutr_No","Nutr_Val","Num_Data_Pts","Std_Error",
"Src_Cd","Deriv_Cd","Ref_NDB_No","Add_Nutr_Mark","Num_Studies",
"Min","Max","DF","Low_EB","Up_EB","Stat_cmt","AddMod_Date")
head(nut_data.dat)
```

```
##   NDB_No Nutr_No Nutr_Val Num_Data_Pts Std_Error Src_Cd Deriv_Cd
## 1   1001    208     717         0        NA      4      NC
## 2   1001    262         0         0        NA      7      Z
## 3   1001    263         0         0        NA      7      Z
## 4   1001    268    2999         0        NA      4      NC
## 5   1001    301     24        17         0      1      A
## 6   1001    304         2        18         0      1      A
##   Ref_NDB_No Add_Nutr_Mark Num_Studies Min Max DF Low_EB Up_EB Stat_cmt
## 1          NA              NA         NA NA NA NA NA      NA      NA
## 2          NA              NA         NA NA NA NA NA      NA      NA
## 3          NA              NA         NA NA NA NA NA      NA      NA
## 4          NA              NA         NA NA NA NA NA      NA      NA
## 5          NA              7    19 30 4    22    26      2, 3
## 6          NA              7     1  2 4     1     1      2, 3
##   AddMod_Date
## 1 08/01/2010
## 2 02/01/2001
## 3 02/01/2001
## 4 09/01/2015
## 5 11/01/2002
## 6 03/01/2003
```

```
summary(nut_data.dat)
```

```
##      NDB_No      Nutr_No      Nutr_Val      Num_Data_Pts
## Min.   : 1001   Min.   :203.0   Min.   :  0.00   Min.   :  0.000
## 1st Qu.: 9265   1st Qu.:315.0   1st Qu.:  0.00   1st Qu.:  0.000
## Median :14199   Median :432.0   Median :  0.22   Median :  0.000
## Mean   :15382   Mean   :452.5   Mean   : 44.21   Mean   :  2.514
## 3rd Qu.:20093   3rd Qu.:611.0   3rd Qu.:  3.00   3rd Qu.:  1.000
## Max.   :93600   Max.   :859.0   Max.   :100000.00 Max.   :2526.000
##
##      Std_Error      Src_Cd      Deriv_Cd      Ref_NDB_No
## Min.   :  0.0   Min.   : 1.000      :167916   Min.   : 1001
## 1st Qu.:  0.0   1st Qu.: 1.000   A      :155838   1st Qu.: 7928
## Median :  0.0   Median : 1.000   Z      : 57711   Median :11291
## Mean   :  2.5   Mean   : 2.853   NC     : 41132   Mean   :12997
## 3rd Qu.:  0.2   3rd Qu.: 4.000   AR     : 24543   3rd Qu.:17339
## Max.   :8560.0   Max.   :13.000   PAK    : 23879   Max.   :90240
## NA's    :532605      (Other):173106   NA's    :615318
##   Add_Nutr_Mark Num_Studies      Min      Max
##   :642161      Min.   :  0.0   Min.   :  0.0   Min.   :  0.0
## N:   940      1st Qu.:  1.0   1st Qu.:  0.0   1st Qu.:  0.0
## Y:  1024      Median :  1.0   Median :  0.1   Median :  0.2
##          Mean   :  1.2   Mean   : 23.1   Mean   : 37.9
##          3rd Qu.:  1.0   3rd Qu.:  2.0   3rd Qu.:  3.3
##          Max.   :22.0   Max.   :19729.0   Max.   :56000.0
##          NA's    :547009   NA's    :547234   NA's    :547232
```

##	DF	Low_EB	Up_EB	Stat_cmt
##	Min. : 0.0	Min. : -42360.0	Min. : 0.0	:547593
##	1st Qu.: 2.0	1st Qu.: 0.0	1st Qu.: 0.0	2, 3 : 44887
##	Median : 3.0	Median : 0.2	Median : 0.6	1, 2, 3: 19866
##	Mean : 4.5	Mean : 22.8	Mean : 51.9	1 : 17033
##	3rd Qu.: 5.0	3rd Qu.: 3.4	3rd Qu.: 7.0	4 : 7948
##	Max. : 1299.0	Max. : 27219.0	Max. : 56240.0	2 : 4056
##	NA's : 574138	NA's : 582109	NA's : 582109	(Other): 2742
##	AddMod_Date			
##	08/01/1984: 24982			
##	04/01/2013: 15881			
##	02/01/2003: 14107			
##	08/01/1992: 13522			
##	03/01/2014: 11974			
##	06/01/2015: 11696			
##	(Other) : 551963			