# Dottable Homework

#### Collin Brown and Jesse Brandt

2025-03-04

### Libraries

```
library(tidyverse)
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
              1.1.4
                                    2.1.5
## v dplyr
                        v readr
## v forcats
              1.0.0
                        v stringr
                                    1.5.1
## v ggplot2 3.5.1
                       v tibble
                                    3.2.1
## v lubridate 1.9.4
                        v tidyr
                                    1.3.1
## v purrr
              1.0.2
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()
                    masks stats::lag()
## i Use the conflicted package (<a href="http://conflicted.r-lib.org/">http://conflicted.r-lib.org/</a>) to force all conflicts to become error
library(dplyr)
library(data.table)
## Attaching package: 'data.table'
##
## The following objects are masked from 'package:lubridate':
##
      hour, isoweek, mday, minute, month, quarter, second, wday, week,
##
##
      yday, year
##
## The following objects are masked from 'package:dplyr':
##
##
       between, first, last
## The following object is masked from 'package:purrr':
##
##
       transpose
```

### Load data

```
nycdata <- fread("nycdata.csv")
glimpse(nycdata)</pre>
```

## Rows: 253,316

```
## Columns: 11
                                                                               <int> 2014, 2014, 2014, 2014, 2014, 2014, 2014, 2014, 2014, 2014, 2014, 2014
## $ year
## $ month
                                                                               ## $ day
## $ dep_delay <int> 14, -3, 2, -8, 2, 4, -2, -3, -1, -2, -5, 7, 3, 142, -5, 18, ~
## $ arr_delay <int> 13, 13, 9, -26, 1, 0, -18, -14, -17, -14, -17, -5, 1, 133, -~
## $ carrier
                                                                                <chr> "AA", "AAA", "
                                                                                <chr> "JFK", "JFK", "JFK", "LGA", "JFK", "EWR", "JFK", "JF
## $ origin
                                                                                <chr> "LAX", "LAX", "LAX", "PBI", "LAX", "LAX", "LAX", "LAX", "MIA~
## $ dest
## $ air_time <int> 359, 363, 351, 157, 350, 339, 338, 356, 161, 349, 161, 365, ~
## $ distance
                                                                              <int> 2475, 2475, 2475, 1035, 2475, 2454, 2475, 2475, 1089, 2422, ~
                                                                               <int> 9, 11, 19, 7, 13, 18, 21, 15, 15, 18, 16, 17, 12, 19, 17, 17~
## $ hour
```

Use and show data.table code to select the variables year, month, day, and hour from the imported flights data

```
nycdata[, .(year,month,day,hour)]
```

##		year	month	day	hour
##		<int></int>	<int></int>	<int></int>	<int></int>
##	1:	2014	1	1	9
##	2:	2014	1	1	11
##	3:	2014	1	1	19
##	4:	2014	1	1	7
##	5:	2014	1	1	13
##					
##	253312:	2014	10	31	14
##	253313:	2014	10	31	8
##	253314:	2014	10	31	11
##	253315:	2014	10	31	11
##	253316:	2014	10	31	8

### Problem 2

Use and show data. table code to produce a table that shows a carrier of DL, an origin of JFK and a destination of SEA

```
nycdata[carrier == "DL" & origin == "JFK" & dest == "SEA"]
```

##		year	month	day	<pre>dep_delay</pre>	arr_delay	carrier	origin	dest	air_time
##		<int></int>	<int></int>	<int></int>	<int></int>	<int></int>	<char></char>	<char></char>	<char></char>	<int></int>
##	1:	2014	1	1	86	79	DL	JFK	SEA	347
##	2:	2014	1	1	-2	-4	DL	JFK	SEA	347
##	3:	2014	1	2	0	11	DL	JFK	SEA	339
##	4:	2014	1	2	-3	9	DL	JFK	SEA	337
##	5:	2014	1	2	21	19	DL	JFK	SEA	337
##										
##	1074:	2014	10	30	-3	-15	DL	JFK	SEA	339
##	1075:	2014	10	31	-6	-26	DL	JFK	SEA	317
##	1076:	2014	10	31	-1	-8	DL	JFK	SEA	338

```
## 1077: 2014
                                               -23
                                                                                  326
                    10
                          31
                                     -1
                                                         DL
                                                                JFK
                                                                        SEA
## 1078:
         2014
                   10
                          31
                                      4
                                                -27
                                                         DL
                                                                JFK
                                                                        SEA
                                                                                  318
##
          distance hour
##
             <int> <int>
##
      1:
              2422
                        9
##
      2:
              2422
                       18
##
      3:
              2422
                       15
              2422
##
      4:
                        7
##
      5:
              2422
                       18
##
## 1074:
              2422
                       18
## 1075:
              2422
                        9
## 1076:
              2422
                        6
## 1077:
              2422
                       15
## 1078:
              2422
                       18
```

## 3789:

719

6

Use and show data.table code to produce a table that shows a carrier of UA, a month of March, and an airtime that is below 330.

```
nycdata[carrier == "UA" & month == 3 & air_time < 330]</pre>
##
                          day dep_delay arr_delay carrier origin
           year month
                                                                        dest air_time
##
          <int> <int> <int>
                                   <int>
                                              <int>
                                                      <char> <char> <char>
                                                                                 <int>
##
           2014
                     3
                            1
                                      11
                                                 43
                                                          UA
                                                                 EWR
                                                                         STT
                                                                                    209
      1:
##
           2014
                     3
                            1
                                      47
                                                 13
                                                          UA
                                                                 EWR
                                                                         PBI
                                                                                   133
      2:
           2014
                     3
                                      39
##
      3:
                            1
                                                 10
                                                          UA
                                                                 EWR
                                                                         MIA
                                                                                   139
##
      4:
           2014
                     3
                            1
                                      -2
                                                -12
                                                          UA
                                                                 EWR
                                                                         IAH
                                                                                   197
##
      5:
           2014
                     3
                            1
                                      34
                                                 36
                                                          UA
                                                                 EWR
                                                                         DEN
                                                                                   256
##
     ___
## 3785:
           2014
                     3
                           31
                                       6
                                                 -8
                                                          UA
                                                                 EWR
                                                                         FLL
                                                                                   155
                                                 -9
## 3786:
           2014
                     3
                           31
                                       7
                                                          UA
                                                                 EWR
                                                                         PBI
                                                                                   135
## 3787:
           2014
                     3
                           31
                                       1
                                                -21
                                                          UA
                                                                 EWR
                                                                         RSW
                                                                                   145
## 3788:
           2014
                                       0
                                                -19
                                                                                   196
                     3
                           31
                                                          UA
                                                                 EWR
                                                                         IAH
   3789:
           2014
                     3
                           31
                                      18
                                                 -7
                                                                 EWR
                                                                         ORD
                                                                                   108
##
                                                          UA
##
          distance
                    hour
##
             <int> <int>
##
      1:
              1634
##
      2:
              1023
                       19
      3:
              1085
##
                       17
##
      4:
              1400
                        5
##
      5:
              1605
                       16
##
## 3785:
              1065
                       16
## 3786:
              1023
                       10
## 3787:
              1068
                       14
                       16
## 3788:
              1400
```

Use and show tidyverse code to produce a table that shows a carrier of UA, a month of March, and an airtime that is below 330.

```
nycdata_4 <- nycdata |>
  filter(carrier == "UA", month == 3, air_time < 330)</pre>
nycdata 4
## Index: <dest__origin__carrier>
##
           year month
                         day dep_delay arr_delay carrier origin
                                                                       dest air_time
##
          <int> <int> <int>
                                  <int>
                                             <int>
                                                     <char> <char> <char>
                                                                                <int>
##
          2014
                     3
                                                 43
                                                          UA
                                                                EWR
                                                                        STT
                                                                                  209
                           1
                                      11
      1:
##
      2:
          2014
                     3
                           1
                                      47
                                                 13
                                                          UA
                                                                EWR
                                                                        PBI
                                                                                  133
           2014
                     3
                           1
                                      39
                                                 10
                                                                        MIA
                                                                                  139
##
      3:
                                                          UA
                                                                EWR
                     3
                                      -2
##
      4:
           2014
                           1
                                                -12
                                                          UA
                                                                 EWR
                                                                        IAH
                                                                                  197
##
      5:
          2014
                     3
                           1
                                      34
                                                 36
                                                                EWR
                                                                        DEN
                                                                                  256
                                                          UA
##
## 3785:
                                                 -8
          2014
                     3
                          31
                                       6
                                                          UA
                                                                EWR
                                                                        FLL
                                                                                  155
   3786:
           2014
                     3
                          31
                                       7
                                                 -9
                                                          UA
                                                                 EWR
                                                                        PBI
                                                                                  135
          2014
                                                -21
                                                                        RSW
                                                                                  145
## 3787:
                     3
                          31
                                       1
                                                          UA
                                                                 EWR
  3788:
           2014
                     3
                          31
                                       0
                                                -19
                                                                        IAH
                                                                                  196
                                                          UA
                                                                 EWR
##
  3789:
          2014
                     3
                                      18
                                                 -7
                                                          UA
                                                                 EWR
                                                                        ORD
                                                                                  108
                          31
##
          distance hour
##
             <int> <int>
##
      1:
              1634
                        9
      2:
              1023
                       19
##
##
      3:
              1085
                       17
##
      4:
              1400
                       5
##
      5:
              1605
                       16
##
## 3785:
              1065
                       16
## 3786:
              1023
                       10
## 3787:
              1068
                       14
## 3788:
              1400
                       16
## 3789:
               719
                        6
```

### Problem 5

##

2014

5:

Use the data.table method to add a variable called speed that is the average air speed of the plane in miles per hour.

```
nycdata_5 <- nycdata
nycdata_5[, speed := (distance / air_time * 60)]
nycdata_5
##
  Index: <dest__origin__carrier>
##
             year month
                          day dep_delay arr_delay carrier origin
                                                                       dest air time
##
            <int> <int> <int>
                                   <int>
                                              <int>
                                                      <char> <char> <char>
                                                                                <int>
##
            2014
                                                 13
                                                                                  359
        1:
                      1
                             1
                                      14
                                                          AA
                                                                JFK
                                                                        LAX
##
        2:
            2014
                      1
                             1
                                       -3
                                                 13
                                                          AA
                                                                JFK
                                                                        LAX
                                                                                  363
            2014
                                       2
                                                  9
##
        3:
                      1
                             1
                                                          AA
                                                                JFK
                                                                        LAX
                                                                                  351
##
        4:
            2014
                      1
                             1
                                       -8
                                                -26
                                                          AA
                                                                LGA
                                                                        PBI
                                                                                  157
```

1

JFK

AA

LAX

350

2

1

1

```
##
## 253312:
             2014
                      10
                             31
                                                   -30
                                                             UA
                                                                   LGA
                                                                           IAH
                                                                                      201
                                         1
## 253313:
             2014
                      10
                             31
                                        -5
                                                   -14
                                                             UA
                                                                   EWR
                                                                            IAH
                                                                                      189
  253314:
             2014
                                        -8
                                                                           RDU
                                                                                       83
                      10
                             31
                                                    16
                                                             MQ
                                                                   LGA
##
   253315:
             2014
                      10
                             31
                                        -4
                                                    15
                                                             MQ
                                                                   LGA
                                                                           DTW
                                                                                       75
   253316:
             2014
                      10
                             31
                                        -5
                                                     1
                                                             MQ
                                                                   LGA
                                                                           SDF
                                                                                      110
##
##
            distance hour
                                speed
               <int> <int>
##
                                <num>
##
         1:
                 2475
                           9 413.6490
##
         2:
                 2475
                         11 409.0909
##
         3:
                 2475
                         19 423.0769
##
         4:
                 1035
                           7 395.5414
         5:
                          13 424.2857
##
                 2475
##
## 253312:
                 1416
                          14 422.6866
## 253313:
                 1400
                           8 444.4444
## 253314:
                  431
                          11 311.5663
## 253315:
                  502
                          11 401.6000
## 253316:
                  659
                           8 359.4545
```

Use the tidyverse method to add a variable called speed that is the average air speed of the plane in miles per hour.

```
day dep_delay arr_delay carrier origin
##
             year month
                                                                           dest air time
            <int> <int> <int>
##
                                     <int>
                                                 <int>
                                                         <char> <char> <char>
                                                                                    <int>
##
         1:
             2014
                       1
                              1
                                         14
                                                    13
                                                             AA
                                                                    JFK
                                                                            LAX
                                                                                       359
##
         2:
             2014
                        1
                              1
                                         -3
                                                    13
                                                             AA
                                                                    JFK
                                                                            LAX
                                                                                       363
                                          2
                                                     9
                                                                    JFK
                                                                                       351
##
         3:
             2014
                              1
                                                                            LAX
                        1
                                                             AA
             2014
                                                                            PBI
                                                                                       157
##
         4:
                       1
                              1
                                         -8
                                                   -26
                                                             AA
                                                                    LGA
                                          2
##
         5:
             2014
                        1
                              1
                                                                    JFK
                                                                                       350
                                                     1
                                                             AA
                                                                            LAX
##
## 253312:
             2014
                      10
                             31
                                          1
                                                   -30
                                                             UA
                                                                    LGA
                                                                            IAH
                                                                                       201
##
   253313:
             2014
                      10
                             31
                                         -5
                                                   -14
                                                             UA
                                                                    EWR
                                                                                       189
                                                                            IAH
## 253314:
             2014
                      10
                             31
                                         -8
                                                             MQ
                                                                            RDU
                                                                                        83
                                                    16
                                                                    LGA
## 253315:
             2014
                      10
                             31
                                         -4
                                                    15
                                                             MQ
                                                                    LGA
                                                                            DTW
                                                                                        75
   253316:
             2014
                             31
                                                                            SDF
##
                      10
                                         -5
                                                     1
                                                             MQ
                                                                    LGA
                                                                                       110
##
            distance
                      hour
                                 speed
##
                <int> <int>
                                 <num>
##
                 2475
                           9 413.6490
         1:
##
         2:
                 2475
                          11 409.0909
##
                          19 423.0769
         3:
                 2475
##
         4:
                 1035
                           7 395.5414
##
         5:
                 2475
                          13 424.2857
##
## 253312:
                          14 422.6866
                 1416
## 253313:
                           8 444.4444
                 1400
```

```
## 253314: 431 11 311.5663
## 253315: 502 11 401.6000
## 253316: 659 8 359.4545
```

### Problem 7a

Show and use coding to change the carrier abbreviation of UA to UniitedAir (sic), 7a. data.table method

```
nycdata 7a <- nycdata
nycdata_7a[carrier == "UA", carrier := "UnitedAir"]
unique(nycdata_7a$carrier) # list all carriers
                                                                             "F9"
##
    [1] "AA"
                      "AS"
                                    "B6"
                                                  "DL"
                                                               "EV"
##
    [7] "FL"
                      "HA"
                                    "MQ"
                                                  "VX"
                                                               "WN"
                                                                             "UnitedAir"
## [13] "US"
                      "00"
nycdata_7a
##
                            day dep_delay arr_delay
                                                         carrier origin
                                                                             dest air_time
             year month
##
            <int> <int>
                          <int>
                                     <int>
                                                 <int>
                                                           <char>
                                                                  <char>
                                                                           <char>
                                                                                      <int>
##
         1:
             2014
                       1
                              1
                                         14
                                                    13
                                                               AA
                                                                      JFK
                                                                              LAX
                                                                                        359
##
         2:
             2014
                       1
                              1
                                         -3
                                                    13
                                                               AA
                                                                      JFK
                                                                              LAX
                                                                                        363
##
         3:
             2014
                                          2
                                                     9
                                                               AA
                                                                      JFK
                                                                              LAX
                                                                                        351
                       1
                              1
             2014
##
         4:
                       1
                              1
                                         -8
                                                   -26
                                                               AA
                                                                      LGA
                                                                              PBI
                                                                                        157
##
         5:
             2014
                       1
                              1
                                          2
                                                     1
                                                               AA
                                                                      JFK
                                                                              LAX
                                                                                        350
##
## 253312:
             2014
                      10
                             31
                                          1
                                                  -30 UnitedAir
                                                                      LGA
                                                                              IAH
                                                                                        201
   253313:
             2014
                      10
                             31
                                         -5
                                                   -14 UnitedAir
                                                                      EWR
                                                                              IAH
                                                                                        189
##
  253314:
             2014
                      10
                             31
                                         -8
                                                    16
                                                                      LGA
                                                                              RDU
                                                                                         83
##
                                                               MQ
## 253315:
             2014
                      10
                             31
                                         -4
                                                    15
                                                               MQ
                                                                      LGA
                                                                              DTW
                                                                                         75
## 253316:
                                         -5
             2014
                      10
                             31
                                                     1
                                                               MQ
                                                                      LGA
                                                                              SDF
                                                                                        110
##
            distance
                       hour
                                 speed
##
               <int> <int>
                                 <num>
##
                 2475
         1:
                           9 413.6490
##
         2:
                 2475
                          11 409.0909
##
         3:
                 2475
                          19 423.0769
##
         4:
                 1035
                           7 395.5414
##
         5:
                 2475
                          13 424.2857
##
## 253312:
                 1416
                          14 422.6866
## 253313:
                 1400
                           8 444.4444
## 253314:
                  431
                          11 311.5663
## 253315:
                  502
                          11 401.6000
## 253316:
                  659
                           8 359.4545
```

### Problem 7b

Show and use coding to change the carrier abbreviation of UA to UniitedAir (sic), 7b. tidyverse method (Use a sequence of dplyr commands so that you can see the change in your table)

```
nycdata_7b <- nycdata |>
  mutate(carrier = case_when(carrier == "UA" ~ "UnitedAir", TRUE ~ carrier))
unique(nycdata_7b$carrier) # list all carriers
```

##	[1] "A	A"	" A	S"	"B6"	"DL"	"E	٧"	"F9"	
##	[7] "F	L"	"Н	Α"	"MQ"	"VX"	"WI	N"	"Uni	tedAir"
##	[13] "U	IS"	"0	0"						
nyo	nycdata_7b									
J	-									
##		year	month	day	dep_delay	arr_delay	carrier	origin	dest	air_time
##		<int></int>	<int></int>	<int></int>	<int></int>	<int></int>	<char></char>	<char></char>	<char></char>	<int></int>
##	1:	2014	1	1	. 14	13	AA	JFK	LAX	359
##	2:	2014	1	1	. –3	13	AA	JFK	LAX	363
##	3:	2014	1	1	. 2	9	AA	JFK	LAX	351
##	4:	2014	1	1			AA	LGA	PBI	157
##	5:	2014	1	1	. 2	1	AA	JFK	LAX	350
##		-								
##	253312:	2014	10	31	. 1	-30	UnitedAir	LGA	IAH	201
##	253313:	2014	10	31	. –5	-14	UnitedAir	EWR	IAH	189
	253314:		10	31	8	16	MQ	LGA	RDU	83
	253315:		10	31	. –4	15	MQ	LGA	DTW	75
##	253316:	2014	10	31	. –5	1	MQ	LGA	SDF	110
##		dista		our	speed					
##			nt> <i< th=""><th></th><th><num></num></th><th></th><th></th><th></th><th></th><th></th></i<>		<num></num>					
##	1:		475		.3.6490					
##	2:		475		9.0909					
##	3:		475		23.0769					
##	4:		035		5.5414					
##	5:	2	475	13 42	24.2857					
##										
	253312:		416		22.6866					
	253313:		400		4.4444					
	253314:		431		1.5663					
	253315:		502		01.6000					
##	253316:	(	659	8 35	9.4545					