```
R version 3.4.1 (2017-06-30) -- "Single Candle"
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Platform: x86_64-w64-mingw32/x64 (64-bit)

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  Natural language support but running in an English locale

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Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

[Previously saved workspace restored]

> #Script Name: dilip.k.lalwani_HW05_Script.R
> #Location: C:\Users\dilip\Google Drive\FALL 2017 CLASSES\STAT 604\HW05
> #Created by Dilip Lalwani
> #Creation Date: 09/18/17
> #Purpose: Practice working with data frames and text files. Analyze Oklahoma school data.
> #Last executed: 09/20/17
>
> Sys.time()
```

```
[1] "2017-09-20 23:47:40 CDT"
>
> #1 housekeeping
> objects()
[1] "OKHS"     "Oklahoma" "zipdata"
> ls()
[1] "OKHS"     "Oklahoma" "zipdata"
> rm(list=ls())
>
> #2 load workspace from previous assignment
> load("C:/Users/dilip/Google Drive/FALL 2017 CLASSES/STAT 604/HW04/HW04.RData")
>
> #show contents of workspace
> ls()
[1] "Oklahoma"
>
> #3 Compute the average of the HSTotal column using various methods
> #3a. Using index numbers
> mean(Oklahoma[,grep("HSTotal", colnames(Oklahoma))], na.rm = TRUE)
[1] 349.757
>
> #3b. Using fully qualified column name
> mean(Oklahoma$HSTotal, na.rm = TRUE)
[1] 349.757
>
> #3c. Using only the column name
> attach(Oklahoma)
> searchpaths()
 [1] ".GlobalEnv"
```

```
 [2] "Oklahoma"
 [3] "C:/Program Files/R/R-3.4.1/library/stats"
 [4] "C:/Program Files/R/R-3.4.1/library/graphics"
 [5] "C:/Program Files/R/R-3.4.1/library/grDevices"
 [6] "C:/Program Files/R/R-3.4.1/library/utils"
 [7] "C:/Program Files/R/R-3.4.1/library/datasets"
 [8] "C:/Program Files/R/R-3.4.1/library/methods"
 [9] "Autoloads"
[10] "C:/PROGRA~1/R/R-34~1.1/library/base"
> mean(HSTotal, na.rm = TRUE)
[1] 349.757
> detach(Oklahoma)
>
> #3d. Compute the mean using the with function
> mean (with(Oklahoma, HSTotal), na.rm = TRUE)
[1] 349.757
>
> #4 Perform a logical test to show which HSTotal values are not missing and are larger than average
> !is.na(Oklahoma$HSTotal) & Oklahoma$HSTotal> mean(Oklahoma$HSTotal, na.rm = TRUE)
  [1] FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE
 [13] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [25] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
 [37] FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE
 [49] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
 [61] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
 [73] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [85]  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [97] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE
[109]  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
```

[121] FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE FALSE

[133] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[145] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[157] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE

[169] TRUE FALSE FALSE FALSE FALSE TRUE TRUE TRUE TRUE FALSE FALSE FALSE

[181] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[193] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE

[205] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[217] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE TRUE FALSE FALSE

[229] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[241] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE

[253] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[265] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[277] TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[289] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE

[301] FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[313] FALSE FALSE TRUE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[325] FALSE TRUE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE

[337] FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE

[349] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[361] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[373] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[385] FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE

[397] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[409] FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

[421] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE

[433] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

[445] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[457] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[469] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[481] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE

[493] FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE

[505] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE

[517] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[529] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[541] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE

[553] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[565] FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[577] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[589] FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE

[601] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[613] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[625] FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[637] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[649] FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE

[661] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[673] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[685] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[697] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE

[709] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[721] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[733] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[745] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE

[757] FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE

[769] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[781] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[793] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE

[805] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[817] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[829] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE

[841] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[853] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[865] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[877] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[889] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[901] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[913] FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE FALSE

[925] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[937] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE

[949] FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE

[961] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[973] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[985] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[997] FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE

[1009] FALSE TRUE TRUE FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE

[1021] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1033] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE

[1045] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1057] TRUE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE FALSE

[1069] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE

[1081] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1093] FALSE FALSE FALSE FALSE FALSE TRUE TRUE TRUE FALSE FALSE TRUE FALSE

[1105] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

[1117] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1129] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1141] FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1153] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[1165] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE

[1177] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1189] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1201] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1213] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1225] FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1237] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE

[1249] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE

[1261] FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1273] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE

[1285] FALSE TRUE TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1297] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1309] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1321] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1333] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1345] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1357] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

[1369] FALSE FALSE FALSE TRUE FALSE TRUE FALSE TRUE FALSE FALSE FALSE FALSE

[1381] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE

[1393] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE

[1405] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

[1417] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[1429] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1441] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE

[1453] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE

[1465] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE TRUE FALSE TRUE

[1477] TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1489] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1501] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1513] FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE

[1525] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE

[1537] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1549] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1561] FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1573] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE TRUE

[1585] FALSE FALSE FALSE FALSE FALSE TRUE TRUE FALSE FALSE FALSE FALSE FALSE

[1597] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE

[1609] FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE FALSE

[1621] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1633] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1645] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1657] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE

[1669] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1681] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE

[1693] FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1705] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1717] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1729] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1741] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1753] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1765] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE

[1777] FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE FALSE

>

> #5 Display school, city and HSTotal of records that meet criteria in previous step

> subset(Oklahoma, (Oklahoma$HSTotal> mean(Oklahoma$HSTotal, na.rm = TRUE)), select = c(School, LocCity, HSTotal))

	School	LocCity	HSTotal
7	ADA HS	ADA	502

33	ALTUS HS	ALTUS	1038
42	ANADARKO HS	ANADARKO	531
58	ARDMORE HS	ARDMORE	780
69	ASTEC CHARTER HS	OKLAHOMA CITY	579
85	BARTLESVILLE HS	BARTLESVILLE	826
86	BARTLESVILLE MHS	BARTLESVILLE	922
107	BERRYHILL HS	TULSA	412
109	BETHANY HS	BETHANY	462
112	BETHEL HS	SHAWNEE	380
122	BIXBY HS	BIXBY	1339
126	BLACKWELL HS	BLACKWELL	396
131	BLANCHARD HS	BLANCHARD	482
145	BOOKER T. WASHINGTON HS	TULSA	1268
165	BRIDGE CREEK HS	BLANCHARD	426
169	BRISTOW HS	BRISTOW	491
174	BROKEN ARROW HS	BROKEN ARROW	2260
175	BROKEN ARROW N INTERMEDIATE HS	BROKEN ARROW	1300
176	BROKEN ARROW S INTERMEDIATE HS	BROKEN ARROW	1141
177	BROKEN BOW HS	BROKEN BOW	569
198	CACHE HS	CACHE	546
225	CAPITOL HILL HS	OKC	1041
226	CARL ALBERT HS	MIDWEST CITY	1057
239	CATOOSA HS	CATOOSA	606
249	CENTRAL 9TH GRADE CTR	SAND SPRINGS	442
263	CENTRAL HS	TULSA	708
277	CHARLES PAGE HS	SAND SPRINGS	1197
280	CHECOTAH HS	CHECOTAH	439
294	CHICKASHA HS	CHICKASHA	740
303	CHOCTAW HS	CHOCTAW	1453

315	CLAREMORE HS	CLAREMORE	1265
317	CLASSEN HS OF ADVANCED STUDIES	OKLAHOMA CITY	547
326	CLEVELAND HS	CLEVELAND	513
331	CLINTON HS	CLINTON	537
344	COLLINSVILLE HS	COLLINSVILLE	711
373	COWETA HS	COWETA	686
392	CUSHING HS	CUSHING	505
400	DANIEL WEBSTER HS	TULSA	604
413	DEER CREEK HS	EDMOND	981
418	DEL CITY HS	DEL CITY	1316
427	DEWEY HS	DEWEY	371
434	DICKSON HS	ARDMORE	406
442	DOUGLASS HS	OKLAHOMA CITY	535
455	DUNCAN HS	DUNCAN	1024
457	DURANT HS	DURANT	843
469	EAST CENTRAL HS	TULSA	1141
487	EISENHOWER HS	LAWTON	1387
490	EL RENO HS	EL RENO	826
495	ELGIN HS	ELGIN	522
498	ELK CITY HS	ELK CITY	365
502	EMERSON ALTERNATIVE ED. (HS)	OKLAHOMA CITY	411
511	ENID HS	ENID	1674
518	EUFAULA HS	EUFAULA	373
549	FORT GIBSON HS	FORT GIBSON	574
569	FRESHMAN ACADEMY	JENKS	781
596	GLENPOOL HS	GLENPOOL	621
629	GROVE HS	GROVE	732
635	GUTHRIE HS	GUTHRIE	900
638	GUYMON HS	GUYMON	730

647	HANNA HS	HANNA	372
650	HARDING CHARTER PREPARATORY HS	OKLAHOMA CITY	462
654	HARRAH HS	HARRAH	477
702	HILLDALE HS	MUSKOGEE	486
751	IDABEL HS	IDABEL	434
764	INOLA HS	INOLA	399
781	JAY HS	JAY	475
794	JENKS HS	JENKS	2181
801	JOHN MARSHALL HS	OKLAHOMA CITY	430
820	KELLYVILLE HS	KELLYVILLE	360
837	KEYS HS	PARK HILL	359
842	KINGFISHER HS	KINGFISHER	357
875	LAWTON HS	LAWTON	1864
915	LITTLE AXE HS	NORMAN	368
918	LOCUST GROVE HS	LOCUST GROVE	472
923	LONE GROVE HS	LONE GROVE	400
943	MACARTHUR HS	LAWTON	1127
948	MADILL HS	MADILL	486
956	MANNFORD HS	MANNFORD	517
971	MARLOW HS	MARLOW	358
988	MCALESTER HS	MCALESTER	893
999	MCLAIN HS FOR SCI./TECHNOLOGY	TULSA	447
1002	MCLOUD HS	MCLOUD	562
1010	MEMORIAL HS	EDMOND	2021
1011	MEMORIAL HS	TULSA	1209
1014	MIAMI HS	MIAMI	726
1018	MIDWEST CITY HS	MIDWEST CITY	1590
1039	MOORE HS	MOORE	2165
1057	MULDROW HS	MULDROW	558

1062	MUSKOGEE HS	MUSKOGEE	1639
1067	MUSTANG HS	MUSTANG	1750
1069	MUSTANG MHS	MUSTANG	685
1077	NATHAN HALE HS	TULSA	999
1084	NEWCASTLE HS	NEWCASTLE	484
1098	NOBLE HS	NOBLE	816
1099	NORMAN HS	NORMAN	1680
1100	NORMAN NORTH HS	NORMAN	2113
1103	NORTH HS	EDMOND	2358
1114	NORTHWEST CLASSEN HS	OKLAHOMA CITY	1068
1145	OKLAHOMA CENTENNIAL HS	OKLAHOMA CITY	351
1153	OKMULGEE HS	OKMULGEE	432
1163	OOLOGAH-TALALA HS	OOLOGAH	587
1176	OWASSO HS	OWASSO	1252
1177	OWASSO MHS	OWASSO	1367
1229	PIEDMONT HS	PIEDMONT	657
1242	PLAINVIEW HS	ARDMORE	364
1255	PONCA CITY HS	PONCA CITY	1561
1263	POTEAU HS	POTEAU	623
1278	PRYOR HS	PRYOR	587
1281	PURCELL HS	PURCELL	399
1286	PUTNAM CITY HS	WARR ACRES	1768
1287	PUTNAM CITY NORTH HS	OKLAHOMA CITY	1987
1288	PUTNAM CITY WEST HS	OKLAHOMA CITY	1582
1366	SALLISAW HS	SALLISAW	650
1372	SANTA FE HS	EDMOND	1878
1374	SANTA FE SOUTH HS	OKLAHOMA CITY	557
1376	SAPULPA HS	SAPULPA	1029
1392	SEMINOLE HS	SEMINOLE	471

1404	SEQUOYAH HS	CLAREMORE	469
1414	SHAWNEE HS	SHAWNEE	1209
1427	SKIATOOK HS	SKIATOOK	720
1447	SOUTHEAST HS	OKLAHOMA CITY	701
1450	SOUTHMOORE HS	MOORE	1983
1458	SPERRY HS	SPERRY	353
1461	SPIRO HS	SPIRO	352
1468	STAR SPENCER HS	SPENCER	428
1474	STIGLER HS	STIGLER	378
1476	STILLWATER HS	STILLWATER	1139
1477	STILLWATER JHS	STILLWATER	353
1480	STILWELL HS	STILWELL	619
1516	TAHLEQUAH HS	TAHLEQUAH	1247
1524	TECUMSEH HS	TECUMSEH	612
1536	THOMAS EDISON PREPARATORY HS	TULSA	1198
1565	TULSA MET./LOMBARD	TULSA	604
1578	TUTTLE HS	TUTTLE	479
1584	U. S. GRANT HS	OKLAHOMA CITY	1563
1590	UNION HS	TULSA	2142
1591	UNION INTERMEDIATE HS	BROKEN ARROW	2216
1607	VERDIGRIS HS	CLAREMORE	352
1614	VINITA HS	VINITA	559
1617	WAGONER HS	WAGONER	663
1668	WEATHERFORD HS	WEATHERFORD	515
1687	WESTERN HEIGHTS HS	OKLAHOMA CITY	860
1691	WESTMOORE HS	OKLAHOMA CITY	1950
1694	WESTVILLE HS	WESTVILLE	352
1729	WILL ROGERS HS	TULSA	1012
1765	WOODWARD HS	WOODWARD	620

```
1783                  YUKON HS        YUKON    2122
>
> #6 Use the apply function to compute the average class size for grades 7 through 12
> apply(cbind(Oklahoma[6:11]), 2, mean, na.rm = TRUE)
   Grade7    Grade8    Grade9   Grade10   Grade11   Grade12
 79.90388  77.21115 102.73077  96.94030  91.06424  85.14655
>
> #7Use the apply function to create a new column called AvgClassSize by computing
> # the average class size of grades 7 through 12 for each school.
> Oklahoma$AvgClassSize <- apply(cbind(Oklahoma[6:11]), 1, mean, na.rm = TRUE)
>
> #8Display the first 25 rows of the modified data frame.
> Oklahoma[1:25,]
             School       LocCity      MailCity          County Teachers
1   7TH & 8TH GRADE CTR      MUSKOGEE      MUSKOGEE   MUSKOGEE COUNTY     47.2
2   8TH & 9TH GRADE CTR      ELK CITY      ELK CITY    BECKHAM COUNTY     31.4
3    ACADEMY CENTRAL ES        TULSA        TULSA      OSAGE COUNTY     21.5
4           ACADEMY ES       GUYMON       GUYMON      TEXAS COUNTY     27.5
5           ACHILLE ES      ACHILLE      ACHILLE      BRYAN COUNTY     15.2
6           ACHILLE HS      ACHILLE      ACHILLE      BRYAN COUNTY      7.6
7              ADA HS          ADA          ADA    PONTOTOC COUNTY     40.5
8             ADA JHS          ADA          ADA    PONTOTOC COUNTY     46.9
9            ADAIR HS        ADAIR        ADAIR      MAYES COUNTY     19.6
10           ADAIR MS        ADAIR        ADAIR      MAYES COUNTY     14.5
11           ADAMS ES         ENID         ENID    GARFIELD COUNTY     23.1
12           ADAMS ES       LAWTON       LAWTON    COMANCHE COUNTY     10.4
13           ADAMS ES       NORMAN       NORMAN  CLEVELAND COUNTY     34.2
14           ADAMS ES OKLAHOMA CITY OKLAHOMA CITY   OKLAHOMA COUNTY     32.8
15          ADDAMS ES        TULSA        TULSA      TULSA COUNTY     15.0
```

16	AFTON ES	AFTON	AFTON	OTTAWA COUNTY	21.7
17	AFTON HS	AFTON	AFTON	OTTAWA COUNTY	10.6
18	AGRA ES	AGRA	AGRA	LINCOLN COUNTY	20.0
19	AGRA HS	AGRA	AGRA	LINCOLN COUNTY	9.0
20	ALBION PUBLIC SCHOOL	ALBION	ALBION	PUSHMATAHA COUNTY	6.3
21	ALCOTT ES	TULSA	TULSA	TULSA COUNTY	18.0
22	ALCOTT MS	NORMAN	NORMAN	CLEVELAND COUNTY	41.2
23	ALEX ES	ALEX	ALEX	GRADY COUNTY	9.2
24	ALEX HS	ALEX	ALEX	GRADY COUNTY	7.6
25	ALEX MS	ALEX	ALEX	GRADY COUNTY	3.3

	Grade7	Grade8	Grade9	Grade10	Grade11	Grade12	Ungraded	PreTotal	ElemTotal
1	337	344	NA	NA	NA	NA	2	NA	681
2	144	157	145	NA	NA	NA	4	NA	301
3	NA	NA	NA	NA	NA	NA	38	64	182
4	NA	NA	NA	NA	NA	NA	NA	NA	418
5	29	26	NA	NA	NA	NA	NA	50	205
6	NA	NA	30	31	31	34	NA	NA	NA
7	NA	NA	NA	168	186	148	NA	NA	NA
8	173	183	183	NA	NA	NA	NA	NA	356
9	NA	NA	82	62	65	76	NA	NA	NA
10	81	77	NA	NA	NA	NA	NA	NA	251
11	NA	NA	NA	NA	NA	NA	NA	105	220
12	NA	NA	NA	NA	NA	NA	NA	39	131
13	NA	NA	NA	NA	NA	NA	NA	135	356
14	NA	NA	NA	NA	NA	NA	NA	130	475
15	NA	NA	NA	NA	NA	NA	NA	53	147
16	31	38	NA	NA	NA	NA	NA	60	278
17	NA	NA	32	30	31	28	NA	NA	NA
18	36	26	NA	NA	NA	NA	NA	63	255

19	NA	NA	25	27	27	19	NA	NA	NA
20	8	9	NA	NA	NA	NA	NA	40	69
21	NA	NA	NA	NA	NA	NA	NA	60	205
22	182	208	NA	NA	NA	NA	NA	NA	618
23	NA	NA	NA	NA	NA	NA	2	36	123
24	NA	NA	38	25	20	23	NA	NA	NA
25	26	20	NA	NA	NA	NA	NA	NA	71

	HSTotal	PTRatio	AvgClassSize
1	NA	14.47	340.5000
2	145	14.33	148.6667
3	NA	13.21	NaN
4	NA	15.20	NaN
5	NA	16.78	27.5000
6	126	16.58	31.5000
7	502	12.40	167.3333
8	183	11.49	179.6667
9	285	14.54	71.2500
10	NA	17.31	79.0000
11	NA	14.07	NaN
12	NA	16.35	NaN
13	NA	14.36	NaN
14	NA	18.45	NaN
15	NA	13.33	NaN
16	NA	15.58	34.5000
17	121	11.42	30.2500
18	NA	15.90	31.0000
19	98	10.89	24.5000
20	NA	17.30	8.5000
21	NA	14.72	NaN

```
22     NA   15.00     195.0000
23     NA   17.50          NaN
24    106   13.95      26.5000
25     NA   21.52      23.0000
>
> #9 Create a new data frame of schools containing HS in the name
> OKHS <- Oklahoma[grepl("\\bHS\\b", Oklahoma$School, ignore.case = FALSE), ]
>
> # show the structure of the new data frame
> str(OKHS[-c(6,7,12:14)])
'data.frame':   462 obs. of  12 variables:
 $ School     : Factor w/ 1636 levels "7TH & 8TH GRADE CTR",..: 6 7 9 14 16 21 25 28 30 33 ...
 $ LocCity    : Factor w/ 442 levels "ACHILLE","ADA",..: 1 2 3 4 5 7 8 9 10 11 ...
 $ MailCity   : Factor w/ 429 levels "ACHILLE","ADA",..: 1 2 3 4 5 7 8 9 10 11 ...
 $ County     : Factor w/ 77 levels "ADAIR COUNTY",..: 7 62 46 58 41 26 2 62 33 76 ...
 $ Teachers   : num  7.6 40.5 19.6 10.6 9 7.6 5 10 66.3 21.8 ...
 $ Grade9     : int  30 NA 82 32 25 38 7 28 269 64 ...
 $ Grade10    : int  31 168 62 30 27 25 14 34 266 69 ...
 $ Grade11    : int  31 186 65 31 27 20 5 40 239 46 ...
 $ Grade12    : int  34 148 76 28 19 23 12 26 264 61 ...
 $ HSTotal    : int  126 502 285 121 98 106 38 128 1038 240 ...
 $ PTRatio    : num  16.6 12.4 14.5 11.4 10.9 ...
 $ AvgClassSize: num  31.5 167.3 71.2 30.2 24.5 ...
>
> #10 Read in zip code database into a data frame for future use
> zipdata <- read.csv(file="C:/Users/dilip/Google Drive/FALL 2017 CLASSES/STAT
604/HW05/zip_codes.csv", header=TRUE, sep=",")
>
> # show the structure of the new data frame
```

```
> str(zipdata)
'data.frame':   42522 obs. of  16 variables:
 $ zip              : int  501 544 601 602 603 604 605 606 610 611 ...
 $ type             : Factor w/ 4 levels "MILITARY","PO BOX",..: 4 4 3 3 3 2 2 3 3 2 ...
 $ primary_city     : Factor w/ 18758 levels "Aaronsburg","Abbeville",..: 7537 7537 73 96 97 97 97
10044 363 388 ...
 $ acceptable_cities   : Factor w/ 7163 levels "","115 Crm Firms",..: 1 1 1 1 5571 5571 1 1 1 1 ...
 $ unacceptable_cities : Factor w/ 10469 levels "","1000 Palms",..: 5694 5804 2921 324 1050 1 1 9849
1849 1 ...
 $ state            : Factor w/ 62 levels "AA","AE","AK",..: 43 43 48 48 48 48 48 48 48 48 ...
 $ county           : Factor w/ 1924 levels "","Abbeville County",..: 1663 1663 9 1 10 1 1 1058 1 1 ...
 $ timezone         : Factor w/ 27 levels "","America/Anchorage",..: 20 20 24 1 24 1 1 24 1 1 ...
 $ area_codes       : Factor w/ 2100 levels "","201","201,212",..: 1219 1219 1597 1596 1596 1 1 1597
1596 1 ...
 $ latitude         : num  40.8 40.8 18.2 18.4 18.4 ...
 $ longitude        : num  -73 -73 -66.7 -67.2 -67.2 ...
 $ world_region     : Factor w/ 8 levels "AF","AS","AU",..: NA NA NA NA NA NA NA NA NA NA ...
 $ country          : Factor w/ 61 levels "AE","AF","AQ",..: 60 60 60 60 60 60 60 60 60 60 ...
 $ decommissioned   : int  0 0 0 0 0 0 0 0 0 0 ...
 $ estimated_population: int  384 0 0 0 0 0 0 0 0 0 ...
 $ notes            : Factor w/ 11 levels "","; Decommisioned, from MPSA Ballot;Country and installation
from  MPSA Ballot",..: 1 1 1 1 1 1 1 1 1 11 ...
>
> #11 Display the contents of the workspace
> ls()
[1] "OKHS"     "Oklahoma" "zipdata"
>
> #12 Save the workspace in a new file
> setwd("C:/Users/dilip/Google Drive/FALL 2017 CLASSES/STAT 604/HW05")
> save.image("HW05.RData")
```

>