```
install.packages("data.table")
```

```
## Installing package into '/usr/local/lib/R/site-library'
## (as 'lib' is unspecified)
```

```
install.packages("dtplyr")
```

```
## Installing package into '/usr/local/lib/R/site-library'
## (as 'lib' is unspecified)
```

```
install.packages("dplyr")
```

```
## Installing package into '/usr/local/lib/R/site-library'
## (as 'lib' is unspecified)
```

```
install.packages('R.utils')
```

```
## Installing package into '/usr/local/lib/R/site-library'
## (as 'lib' is unspecified)
```

```
library(data.table)
library(dtplyr)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:data.table':
##
##     between, first, last
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
download.file("https://raw.githubusercontent.com/JSC370/JSC370-2025/main/data/met/met_all.gz", destfile
met <- fread("met_all.gz")

stations <- fread("ftp://ftp.ncdc.noaa.gov/pub/data/noaa/isd-history.csv")

stations[, USAF := as.integer(USAF)]
```

```
## Warning in eval(jsub, SDenv, parent.frame()): NAs introduced by coercion
```

```
# Dealing with NAs and 999999
stations[, USAF   := fifelse(USAF == 999999, NA_integer_, USAF)]
stations[, CTRY   := fifelse(CTRY == "", NA_character_, CTRY)]
stations[, STATE  := fifelse(STATE == "", NA_character_, STATE)]

# Selecting the three relevant columns, and keeping unique records
stations <- unique(stations[, list(USAF, CTRY, STATE)])

# Dropping NAs
stations <- stations[!is.na(USAF)]
```

```r
# Removing duplicates
stations[, n := 1:.N, by = .(USAF)]
stations <- stations[n == 1,][, n := NULL]
```

```r
# Rename USAFID in 'met' to USAF
setnames(met, "USAFID", "USAF")

merged_data <- met %>%
  left_join(stations, by = "USAF")
```

```r
head(met)
```

```
##      USAF  WBAN  year month   day  hour   min   lat      lon  elev wind.dir
##     <int> <int> <int> <int> <int> <int> <int> <num>    <num> <int>    <int>
## 1: 690150 93121  2019     8     1     0    56  34.3 -116.166   696      220
## 2: 690150 93121  2019     8     1     1    56  34.3 -116.166   696      230
## 3: 690150 93121  2019     8     1     2    56  34.3 -116.166   696      230
## 4: 690150 93121  2019     8     1     3    56  34.3 -116.166   696      210
## 5: 690150 93121  2019     8     1     4    56  34.3 -116.166   696      120
## 6: 690150 93121  2019     8     1     5    56  34.3 -116.166   696       NA
##    wind.dir.qc wind.type.code wind.sp wind.sp.qc ceiling.ht ceiling.ht.qc
##         <char>         <char>   <num>     <char>      <int>         <int>
## 1:           5              N     5.7          5      22000             5
## 2:           5              N     8.2          5      22000             5
## 3:           5              N     6.7          5      22000             5
## 4:           5              N     5.1          5      22000             5
## 5:           5              N     2.1          5      22000             5
## 6:           9              C     0.0          5      22000             5
##    ceiling.ht.method sky.cond vis.dist vis.dist.qc vis.var vis.var.qc  temp
##                <char>   <char>    <int>      <char>  <char>     <char> <num>
## 1:                 9        N    16093           5       N          5  37.2
## 2:                 9        N    16093           5       N          5  35.6
## 3:                 9        N    16093           5       N          5  34.4
## 4:                 9        N    16093           5       N          5  33.3
## 5:                 9        N    16093           5       N          5  32.8
## 6:                 9        N    16093           5       N          5  31.1
##    temp.qc dew.point dew.point.qc atm.press atm.press.qc       rh
##     <char>     <num>       <char>     <num>        <int>    <num>
## 1:       5      10.6            5    1009.9            5 19.88127
## 2:       5      10.6            5    1010.3            5 21.76098
## 3:       5       7.2            5    1010.6            5 18.48212
## 4:       5       5.0            5    1011.6            5 16.88862
## 5:       5       5.0            5    1012.7            5 17.38410
## 6:       5       5.6            5    1012.7            5 20.01540
```

```r
# Calculate the median of temperature, wind speed, and atmospheric pressure
median_temp <- quantile(merged_data$temp, 0.5, na.rm = TRUE)
median_wind <- quantile(merged_data$wind.sp, 0.5, na.rm = TRUE)
median_pressure <- quantile(merged_data$atm.press, 0.5, na.rm = TRUE)

# Find stations with the median temperature, wind speed, and atmospheric pressure
station_median_temp <- merged_data[abs(merged_data$temp - median_temp) < 0.01, .(USAF, temp)]
station_median_wind <- merged_data[abs(merged_data$wind.sp - median_wind) < 0.01, .(USAF, wind.sp)]
station_median_pressure <- merged_data[abs(merged_data$atm.press - median_pressure) < 0.01, .(USAF, atm
```

```r
# Print the stations with median values
print(station_median_temp)
```

```
##         USAF  temp
##        <int> <num>
##    1: 720113  23.5
##    2: 720113  23.5
##    3: 720113  23.5
##    4: 720113  23.5
##    5: 720113  23.5
##   ---
## 7357: 726679  23.5
## 7358: 726679  23.5
## 7359: 726679  23.5
## 7360: 726679  23.5
## 7361: 726679  23.5
```

```r
print(station_median_wind)
```

```
##           USAF wind.sp
##          <int>   <num>
##      1: 690150     2.1
##      2: 690150     2.1
##      3: 690150     2.1
##      4: 690150     2.1
##      5: 690150     2.1
##     ---
## 264798: 726813     2.1
## 264799: 726813     2.1
## 264800: 726813     2.1
## 264801: 726813     2.1
## 264802: 726813     2.1
```

```r
print(station_median_pressure)
```

```
##         USAF atm.press
##        <int>     <num>
##    1: 690150    1014.1
##    2: 690150    1014.1
##    3: 690150    1014.1
##    4: 720175    1014.1
##    5: 720175    1014.1
##   ---
## 8783: 726813    1014.1
## 8784: 726813    1014.1
## 8785: 726813    1014.1
## 8786: 726813    1014.1
## 8787: 726813    1014.1
```

```r
# Check if the stations with median values coincide
coincide_stations_temp_wind <- intersect(station_median_temp$USAF, station_median_wind$USAF)
coincide_stations_all <- intersect(coincide_stations_temp_wind, station_median_pressure$USAF)

# Print the stations that coincide across all three
print(coincide_stations_all)
```

```
##  [1] 720965 722090 722093 722175 722210 722238 722246 722250 722269 722270
## [11] 722390 722570 722576 722686 722730 722817 722860 722975 723034 723066
## [21] 723231 723405 723520 723535 723540 723550 723810 724037 724090 724096
## [31] 724338 724457 724467 724505 724550 724680 724695 724837 725144 725335
## [41] 725377 725755 726055 726436 726625
```

Yes, some of them coincide.