TEMPERATURE MODELS

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```
knitr::opts_chunk$set(echo = TRUE)
```

!!!!!!!!!!!!!!!!!!! LOADING THE PACKAGES !!!!!!!!!!!!!!!!!!!

```
library("tidyr")
#library("feasts")
library("MMWRweek")
#library("data.table")
#library("caret")
library("purrr")
#library("skimr")
#library("ggcorrplot")
#library("DataExplorer")
#library("cdcfluview")
library("dplyr")
```

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

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

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

```
library("tseries")
```

```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
```

```
library("forecast")
#library("tsibble")
#library("berryFunctions")
library("scoringutils")
```

```
## Note: scoringutils is currently undergoing major development changes (with an update planned for the
```

```
library("covidHubUtils")
#library("gtools")
library("parallel")
#library("doParallel")
#library("foreach")
library("future")#https://cran.r-project.org/web/packages/future/vignettes/future-4-issues.html
```

```
##
## Attaching package: 'future'

## The following object is masked from 'package:tseries':
##
##     value
```

```
library("listenv")
```

```
##
## Attaching package: 'listenv'

## The following object is masked from 'package:purrr':
##
##     map
```

```
#library("lubridate")
#library("corrplot")
#library("sf")
#library("ggrepel")
#library("Metrics")
library("epitools")
```

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! LOADING DATASET AND FUNCTIONS !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

```
##############################################
#       LOADING AND CLEANING THE DATASET
##############################################
source("ES_TEMPERATURE.r", local = TRUE, chdir = TRUE)
temperature_data = read.csv("temperature_data.csv")
temperature_data <- temperature_data %>% select(-Dates)

my_data = read.csv("ILINet.csv")
state_codes<-read.csv("State_Codes.csv")

list_of_states <- combining_states_data(my_data, state_codes) %>%
  setNames(state_codes$location_name)%>%
  .[c(-48,-49,-50,-51,-52,-53)]
```

EXAMPLE FOR A SINGLE STATE

```
source("ES_TEMPERATURE.r", local = TRUE, chdir = TRUE)

#one_state<-list(list_of_states[['Alabama']])

#single_state_example <- mclapply(one_state, ES_TEMPERATURE, auto=TRUE, n_weeks_ahead=1,temperature_dat
```

AUTO TEMPERATURE WEEK1

```
# RUN MODEL
AUTO_TEMPERATURE_WEEK1_list <- mclapply(list_of_states, ES_TEMPERATURE, auto=TRUE, n_weeks_ahead=1,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, auto = TRUE, n_weeks_ahead
## = 1, : all scheduled cores encountered errors in user code
```

```
# FINAL DATAFRAME
AUTO_TEMPERATURE_WEEK1 <- bind_rows(AUTO_TEMPERATURE_WEEK1_list, .id = "State")
```

AUTO TEMPERATURE WEEK2

```
# RUN MODEL
AUTO_TEMPERATURE_WEEK2_list <- mclapply(list_of_states, ES_TEMPERATURE, auto=TRUE, n_weeks_ahead=2,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, auto = TRUE, n_weeks_ahead
## = 2, : all scheduled cores encountered errors in user code
```

```
# FINAL DATAFRAME
AUTO_TEMPERATURE_WEEK2 <- bind_rows(AUTO_TEMPERATURE_WEEK2_list, .id = "State")
```

AUTO TEMPERATURE WEEK3

```
AUTO_TEMPERATURE_WEEK3_list <- mclapply(list_of_states, ES_TEMPERATURE, auto=TRUE, n_weeks_ahead=3,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, auto = TRUE, n_weeks_ahead
## = 3, : all scheduled cores encountered errors in user code
```

```
# Combine the list of data frames into a single data frame with names as a column
AUTO_TEMPERATURE_WEEK3 <- bind_rows(AUTO_TEMPERATURE_WEEK3_list, .id = "State")
```

AUTO TEMPERATURE WEEK4

```
AUTO_TEMPERATURE_WEEK4_list <- mclapply(list_of_states, ES_TEMPERATURE, auto=TRUE, n_weeks_ahead=4,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, auto = TRUE, n_weeks_ahead
## = 4, : all scheduled cores encountered errors in user code
```

```
# Combine the list of data frames into a single data frame with names as a column
AUTO_TEMPERATURE_WEEK4 <- bind_rows(AUTO_TEMPERATURE_WEEK4_list, .id = "State")
```

```
save.image("TEMPERATURE_MODELS.Rdata")
```

ES27 TEMPERATURE WEEK1

```
ES27_TEMPERATURE_WEEK1_list <- mclapply(list_of_states, ES_TEMPERATURE, ES27=TRUE, n_weeks_ahead=1,tempe
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES27 = TRUE, n_weeks_ahead
## = 1, : all scheduled cores encountered errors in user code
```

```
# Combine the list of data frames into a single data frame with names as a column
ES27_TEMPERATURE_WEEK1 <- bind_rows(ES27_TEMPERATURE_WEEK1_list, .id = "State")
```

ES27 TEMPERATURE WEEK2

```
ES27_TEMPERATURE_WEEK2_list <- mclapply(list_of_states, ES_TEMPERATURE, ES27=TRUE, n_weeks_ahead=2,tempe
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES27 = TRUE, n_weeks_ahead
## = 2, : all scheduled cores encountered errors in user code
```

```
# Combine the list of data frames into a single data frame with names as a column
ES27_TEMPERATURE_WEEK2 <- bind_rows(ES27_TEMPERATURE_WEEK2_list, .id = "State")
```

ES27 TEMPERATURE WEEK3

```
ES27_TEMPERATURE_WEEK3_list <- mclapply(list_of_states, ES_TEMPERATURE, ES27=TRUE, n_weeks_ahead=3,tempe
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES27 = TRUE, n_weeks_ahead
## = 3, : all scheduled cores encountered errors in user code
```

```
# Combine the list of data frames into a single data frame with names as a column
ES27_TEMPERATURE_WEEK3 <- bind_rows(ES27_TEMPERATURE_WEEK3_list, .id = "State")
```

ES27 TEMPERATURE WEEK4

```
ES27_TEMPERATURE_WEEK4_list <- mclapply(list_of_states, ES_TEMPERATURE, ES27=TRUE, n_weeks_ahead=4,tempe
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES27 = TRUE, n_weeks_ahead
## = 4, : all scheduled cores encountered errors in user code
```

```
# Combine the list of data frames into a single data frame with names as a column
ES27_TEMPERATURE_WEEK4 <- bind_rows(ES27_TEMPERATURE_WEEK4_list, .id = "State")
```

```
save.image("TEMPERATURE_MODELS.Rdata")
```

ES64 TEMPERATURE WEEK1

```
ES64_TEMPERATURE_WEEK1_list <- mclapply(list_of_states, ES_TEMPERATURE, ES64=TRUE, n_weeks_ahead=1,tempe
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES64 = TRUE, n_weeks_ahead
## = 1, : all scheduled cores encountered errors in user code
```

```r
# Combine the list of data frames into a single data frame with names as a column
ES64_TEMPERATURE_WEEK1 <- bind_rows(ES64_TEMPERATURE_WEEK1_list, .id = "State")
```

ES64 TEMPERATURE WEEK2

```r
ES64_TEMPERATURE_WEEK2_list <- mclapply(list_of_states, ES_TEMPERATURE, ES64=TRUE, n_weeks_ahead=2,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES64 = TRUE, n_weeks_ahead
## = 2, : all scheduled cores encountered errors in user code
```

```r
# Combine the list of data frames into a single data frame with names as a column
ES64_TEMPERATURE_WEEK2 <- bind_rows(ES64_TEMPERATURE_WEEK2_list, .id = "State")
```

ES64 TEMPERATURE WEEK3

```r
ES64_TEMPERATURE_WEEK3_list <- mclapply(list_of_states, ES_TEMPERATURE, ES64=TRUE, n_weeks_ahead=3,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES64 = TRUE, n_weeks_ahead
## = 3, : all scheduled cores encountered errors in user code
```

```r
# Combine the list of data frames into a single data frame with names as a column
ES64_TEMPERATURE_WEEK3 <- bind_rows(ES64_TEMPERATURE_WEEK3_list, .id = "State")
```

ES64 TEMPERATURE WEEK4

```r
ES64_TEMPERATURE_WEEK4_list <- mclapply(list_of_states, ES_TEMPERATURE, ES64=TRUE, n_weeks_ahead=4,tempo
  setNames(names(list_of_states))
```

```
## Warning in mclapply(list_of_states, ES_TEMPERATURE, ES64 = TRUE, n_weeks_ahead
## = 4, : all scheduled cores encountered errors in user code
```

```r
# Combine the list of data frames into a single data frame with names as a column
ES64_TEMPERATURE_WEEK4 <- bind_rows(ES64_TEMPERATURE_WEEK4_list, .id = "State")
```

```r
save.image("TEMPERATURE_MODELS.Rdata")
```