2020 Black Population-WEB DuBois Visualization

Christie Williams

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Purpose

This work utilizes 2020 US Voting data to analyze the black voting population by state and applies techniques of W.E.B. Dubois to visualize the top 15 most popluated by blacks in the US.

Add Libraries

Packages were previously installed. Calling all libraries used in this work.

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.1.3
```

```
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(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --

## v tibble  3.1.6     v purrr   0.3.4
## v tidyr   1.1.4     v stringr 1.4.0
## v readr   2.1.0     v forcats 0.5.1

## Warning: package 'tibble' was built under R version 4.1.2
```

```
## Warning: package 'readr' was built under R version 4.1.2

## -- Conflicts --------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(openxlsx)
```

```
## Warning: package 'openxlsx' was built under R version 4.1.2
```

Step 1: Import Data

Data is imported from US Census Bureau and saved to "testFrame" dataframe.

Step 2: Clean Data

Add State Names

Currently, state names are listed once for state totals and absent from the breakdown of sex, race, and Hispanic-Origin. The below code adds state names to each of the demographics.

```
testFrame[6:15, 1] <- "US"
testFrame[17:26, 1] <- "ALABAMA"
testFrame[28:37, 1] <- "ALASKA"
testFrame[39:48, 1] <- "ARIZONA"
testFrame[50:59, 1] <- "ARKANSAS"
testFrame[61:70, 1] <- "CALIFORNIA"
testFrame[72:81, 1] <- "COLORADO"
testFrame[83:92, 1] <- "CONNECTICUT"
testFrame[94:103, 1] <- "DELAWARE"
testFrame[105:114, 1] <- "DISTRICT OF COLUMBIA"
testFrame[116:125, 1] <- "FLORIDA"
testFrame[127:136, 1] <- "GEORGIA"
testFrame[138:147, 1] <- "HAWAII"
testFrame[149:158, 1] <- "IDAHO"
testFrame[160:169, 1] <- "ILLINOIS"
testFrame[171:180, 1] <- "INDIANA"
testFrame[182:191, 1] <- "IOWA"
testFrame[193:202, 1] <- "KANSAS"
testFrame[204:213, 1] <- "KENTUCKY"
testFrame[215:224, 1] <- "LOUISIANA"
testFrame[226:235, 1] <- "MAINE"
testFrame[237:246, 1] <- "MARYLAND"
testFrame[248:257, 1] <- "MASSACHUSETTS"
testFrame[259:268, 1] <- "MICHIGAN"
testFrame[270:279, 1] <- "MINNESOTA"
```

```
testFrame[281:290, 1] <- "MISSISSIPPI"
testFrame[292:301, 1] <- "MISSOURI"
testFrame[303:312, 1] <- "MONTANA"
testFrame[314:323, 1] <- "NEBRASKA"
testFrame[325:334, 1] <- "NEVADA"
testFrame[336:345, 1] <- "NEW HAMPSHIRE"
testFrame[347:356, 1] <- "NEW JERSEY"
testFrame[358:367, 1] <- "NEW MEXICO"
testFrame[369:378, 1] <- "NEW YORK"
testFrame[380:389, 1] <- "NORTH CAROLINA"
testFrame[391:400, 1] <- "NORTH DAKOTA"
testFrame[402:411, 1] <- "OHIO"
testFrame[413:422, 1] <- "OKLAHOMA"
testFrame[424:433, 1] <- "OREGON"
testFrame[435:444, 1] <- "PENNSYLVANIA"
testFrame[446:455, 1] <- "RHODE ISLAND"
testFrame[457:466, 1] <- "SOUTH CAROLINA"
testFrame[468:477, 1] <- "SOUTH DAKOTA"
testFrame[479:488, 1] <- "TENNESSEE"
testFrame[490:499, 1] <- "TEXAS"
testFrame[501:510, 1] <- "UTAH"
testFrame[512:521, 1] <- "VERMONT"
testFrame[523:532, 1] <- "VIRGINIA"
testFrame[534:543, 1] <- "WASHINGTON"
testFrame[545:554, 1] <- "WEST VIRGINIA"
testFrame[556:565, 1] <- "WISCONSIN"
testFrame[567:576, 1] <- "WYOMING"
```

Create New Dataframe

Unutilized comments and headers are removed. Data utilized in visualization is extracted into a new dataframe and column headers are added.

```
testFrame <- testFrame[-577:-583, ]
testFrame <- testFrame[-1:-4, ]
testFrame <- testFrame[ , c(1:3, 5, 10)]
colnames(testFrame) <- c("State", "SexRaceHispanic", "Population", "Registered",
                         "Voted")
```

Convert Data Types

Conversion of data types for data manipulation. State names, totals, and demographics are changed to factors. Numbers such as Population, Registered, and Voted are changed from character to numeric. Row names (numbers) are reset.

```
testFrame$State <- as.factor(testFrame$State)
testFrame$SexRaceHispanic <- as.factor(testFrame$SexRaceHispanic)
testFrame$Population <- as.numeric(testFrame$Population)
testFrame$Registered <- as.numeric(testFrame$Registered)
```

```
## Warning: NAs introduced by coercion
```

```
testFrame$Voted <- as.numeric(testFrame$Voted)
```

```
## Warning: NAs introduced by coercion
```

```
rownames(testFrame) = NULL
```

Step 3: Data Manipulation

Filter dataframe

Dataframe is filtered for "Black alone" and state names changed to uppercase, and total US black population removed. to create W.E.B. Dubois's visualization (Plate 3).

```
BlackPopulation <- testFrame %>%
  filter(SexRaceHispanic == "Black alone") %>%
  mutate(State = toupper(State))

BlackPopulation <- BlackPopulation[-1, ]
```

Step 4: Visualization

Create Graph

dplyr and ggplot2 are utilized to plot the top 15 US states with the highest black populations.

Adapted from Ella Hollowood link

```
top_n(BlackPopulation, n = 15, Population) %>%
  ggplot(., aes(x = reorder(State, Population), y = Population)) +
  geom_bar(
    stat = "identity",
    width = 0.5,
    fill = "red3") +
  coord_flip() +
  geom_text(data = subset(BlackPopulation, Population >= 2700),
            aes(y = Population, ymax = Population, label = Population),
            hjust = 13, size = 5) +
  geom_text(data = subset(BlackPopulation, Population == 994),
            aes(y = Population, ymax = Population, label = Population),
```

```
            hjust = 6 , size = 5) +
  theme(text = element_text(),
        panel.background = element_blank(),
        axis.title = element_blank(),
        axis.text.x = element_blank(),
        axis.text.y = element_text(size = 16),
        axis.ticks = element_blank(),
        panel.grid = element_blank(),
        plot.title = element_text(size = 24, hjust = 0.5, margin = margin(0,0,30,0))) +
  labs(title = "2020 THE STATES OF THE UNITED STATES ACCORDING\nTO THEIR BLACK POPULATION.")
```

```
## Warning: Ignoring unknown aesthetics: ymax
```

```
## Warning: Ignoring unknown aesthetics: ymax
```