

Technical Report

```
library(tidygeocoder)
library(tidyverse)
library(sf)
library(spData)
library(tmap)
library(USAboundaries)
library(leaflet)
library(USAboundariesData)
library(devtools)
library(ggplot2)
library(ggmap)
library(osrm)
```

```
# Downloaded individual county data from this website https://www.ncsbe.gov/results-data/voter-registra
```

```
# Wake County, NC largest county (1.11M, 887K observations in data)
```

```
# I manually collected addresses of jails, supervisor of elections offices, prisons, and homeless shelters
```

```
WakeCounty <- read.delim(file.choose())
```

```
Wake1 <- filter(WakeCounty, mail_addr1 == "3301 HAMMOND RD" )
Wake2 <- filter(WakeCounty, mail_addr1 == "330 S SALISBURY ST")
Wake3 <- filter(WakeCounty, mail_addr1 == "1300 WESTERN BLVD")
Wake4 <- filter(WakeCounty, mail_addr1 == "1000 ROCK QUARRY RD")
Wake5 <- filter(WakeCounty, mail_addr1 == "1200 N NEW HOPE RD")
WakeHomeless1 <- filter(WakeCounty, mail_addr1 == "903 METHOD RD")
WakeHomeless2 <- filter(WakeCounty, mail_addr1 == "908 W MORGAN ST")
WakeHomeless3 <- filter(WakeCounty, mail_addr1 == "314 E HARGETT ST")
WakeHomeless4 <- filter(WakeCounty, mail_addr1 == "1420 S WILMINGTON ST" )
WakeHomeless5 <- filter(WakeCounty, mail_addr1 == "400 S WEST ST")
WakeHomeless6 <- filter(WakeCounty, mail_addr1 == "1216 N ROXBORO ST")
WakeHomeless7 <- filter(WakeCounty, mail_addr1 == "491 JAMES JACKSON AVE")
WakeHomeless8 <- filter(WakeCounty, mail_addr1 == "215 S PERSON ST")
WakeHomeless9 <- filter(WakeCounty, mail_addr1 == "919 KILDAIRE FARM RD" )
WakeHomeless10 <- filter(WakeCounty, mail_addr1 == "1201 E MAIN ST")
WakeHomeless11 <- filter(WakeCounty, mail_addr1 == "507 E KNOX ST")
WakeHomeless12 <- filter(WakeCounty, mail_addr1 == "1200 CORPORATION PKWY")
WakeHomeless13 <- filter(WakeCounty, mail_addr1 == "220 SNOW AVE")
WakeHomeless14 <- filter(WakeCounty, mail_addr1 == "1600 OLIVE CHAPEL RD")
WakeHomeless15 <- filter(WakeCounty, mail_addr1 == "5800 FARINGDON PL")
WakeHomeless16 <- filter(WakeCounty, mail_addr1 == "3603 BASTION LN")
WakeHomeless17 <- filter(WakeCounty, mail_addr1 == "300 GLENN FALL LN")
WakeHomeless18 <- filter(WakeCounty, mail_addr1 == "1863 CAPITAL BLVD")
WakeHomeless19 <- filter(WakeCounty, mail_addr1 == "1345 CRABTREE BLVD")
```

Observations found

Wake1 (jail) - 29 obs

Wake2 (sheriffs office) - 7 obs

Wake3 (Prison) - 0 obs

Wake4 (Prison) - 3 obs

Wake5 (SOE) - 3 obs

homeless1 - 24 obs

homeless2 - 0 obs

homeless3 - 94 obs

homeless4 - 725 obs!!

homeless5 - 4 obs

homeless6 - 0 obs

homeless7 - 0 obs

homeless8 - 8obs

homeless9 - 0 obs

homeless10 - 0 obs

homeless11 - 0 obs

homeless12 - 0 obs

homeless13 - 403 obs!

homeless14 - 0 obs

homeless15 - 0 obs

homeless16 - 0 obs

homeless17 - 0 obs

homeless18 - 42 obs

homeless 19 - 5 obs

```
# Downloaded individual county data from this website https://www.ncsbe.gov/results-data/voter-registration
```

```
# Mecklenburg County, NC second largest county (1.11M, 878K observations in data)
```

```
# I manually collected addresses of jails, supervisor of elections offices, prisons, and homeless shelters
```

```
Mecklenburg <- read.delim(file.choose())
```

```
Mecklenburg1 <- filter(Mecklenburg, mail_addr1 == "801 E 4TH ST")
```

```
Mecklenburg2 <- filter(Mecklenburg, mail_addr1 == "5235 SPECTOR DR")
```

```
MecklenburgHomeless1 <- filter(Mecklenburg, mail_addr1 == "618 COLLEGE ST")
```

```
MecklenburgHomeless2 <- filter(Mecklenburg, mail_addr1 == "300 HAWTHORNE LN")
MecklenburgHomeless3 <- filter(Mecklenburg, mail_addr1 == "2410 THE PLAZA")
MecklenburgHomeless4 <- filter(Mecklenburg, mail_addr1 == "945 N COLLEGE ST")
MecklenburgHomeless5 <- filter(Mecklenburg, mail_addr1 == "1210 N TRYON ST")
MecklenburgHomeless6 <- filter(Mecklenburg, mail_addr1 == "534 SPRATT ST")
MecklenburgHomeless7 <- filter(Mecklenburg, mail_addr1 == "3410 STATESVILLE AVE")
MecklenburgHomeless8 <- filter(Mecklenburg, mail_addr1 == "107 CROMER ST")
```

Observations found

Mecklenburg1 (jail) - 14 obs

Mecklenburg2 (SOE) - 0

MecklenburgHomeless1 - 0

MecklenburgHomeless2 - 5 obs

MecklenburgHomeless3 - 4 obs

MecklenburgHomeless4 - 469 obs

MecklenburgHomeless5 - 391 obs

MecklenburgHomeless6 - 406 obs

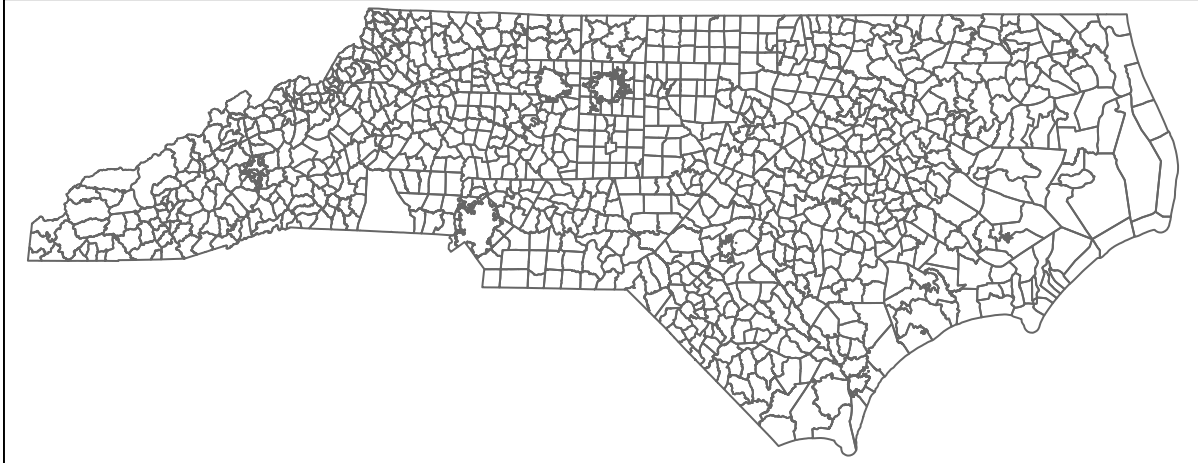
MecklenburgHomeless7 - 61 obs

MecklenburgHomeless8 - 19 obs

```
# downloaded a shapefile from https://catalog.data.gov/dataset/tiger-line-shapefile-2019-state-north-ca
Wake_precincts <- st_read("C:/Users/Spot/Documents/1. Sonia/School/FALL 20/DATA/Project/tl_2019_37_cousub")
```

```
## Reading layer 'tl_2019_37_cousub' from data source
##   'C:\Users\Spot\Documents\1. Sonia\School\FALL 20\DATA\Project\tl_2019_37_cousub'
##   using driver 'ESRI Shapefile'
## Simple feature collection with 1041 features and 18 fields
## Geometry type: MULTIPOLYGON
## Dimension:      XY
## Bounding box:   xmin: -84.32182 ymin: 33.75288 xmax: -75.40012 ymax: 36.58814
## Geodetic CRS:   NAD83
```

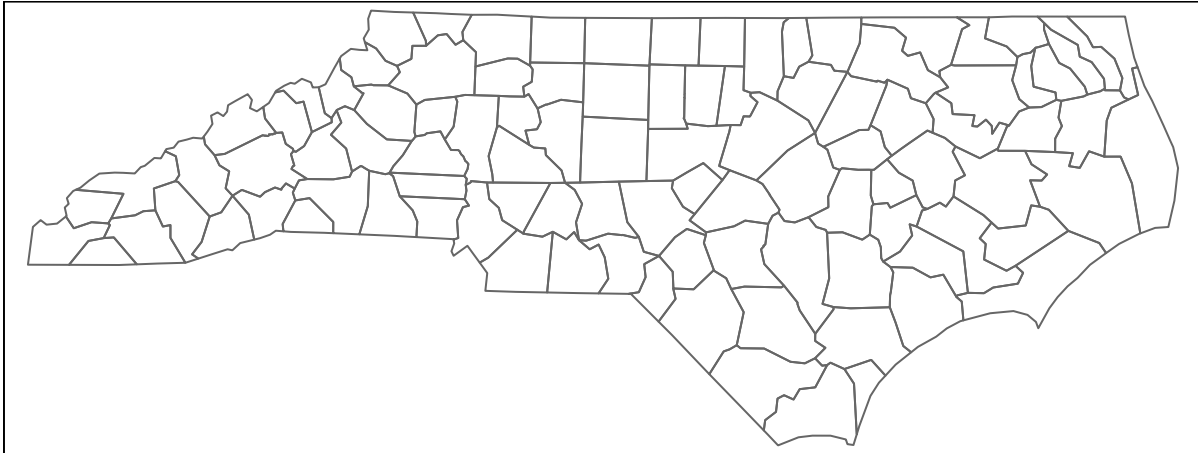
```
tm_shape(Wake_precincts)+tm_borders()
```



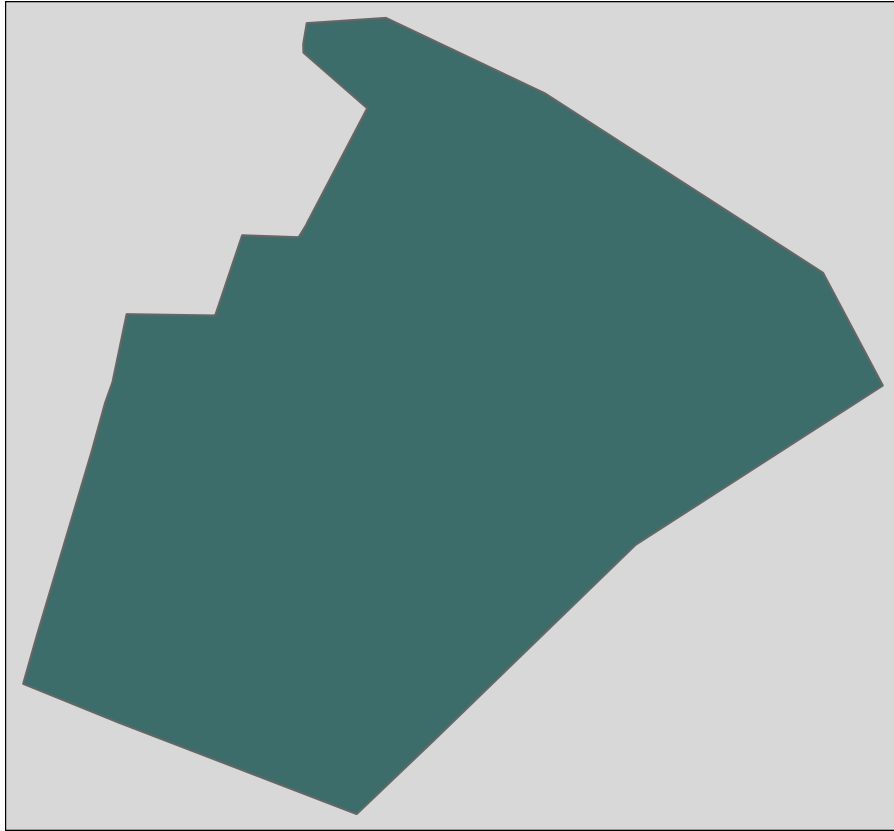
```
counties <- USAboundaries::us_counties(states = "North Carolina")
filter(counties, name == "Wake")
```

```
## Simple feature collection with 1 feature and 12 fields
## Geometry type: MULTIPOLYGON
## Dimension:      XY
## Bounding box:  xmin: -78.99506 ymin: 35.5193 xmax: -78.25597 ymax: 36.07448
## Geodetic CRS:  WGS 84
##   statefp countyfp countyns      affgeoid geoid name lsad      aland  awater
## 1      37      183 01008592 05000000US37183 37183 Wake   06 2162149712 58100780
##      state_name state_abbr jurisdiction_type      geometry
## 1 North Carolina      NC      state MULTIPOLYGON (((-78.98312 3...
```

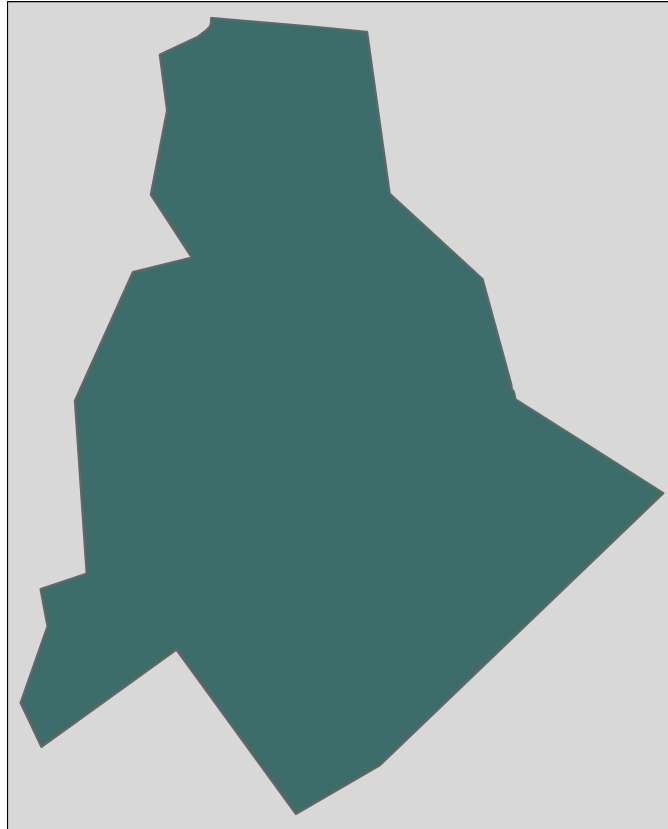
```
tm_shape(counties)+tm_borders()
```



```
Wakemap <- us_counties(states = "North Carolina") %>%  
  filter(name == "Wake")  
tm_shape(Wakemap)+tm_borders()+tm_fill(col = "#3D6D6A")+  
  tm_layout(bg.color = "#D8D8D8")
```



```
Meckmap <- us_counties(states = "North Carolina") %>%  
  filter(name == "Mecklenburg")  
  
tm_shape(Meckmap)+tm_borders()+tm_fill(col = "#3D6D6A")+  
  tm_layout(bg.color = "#D8D8D8")
```



```
# only the addresses that had at least one observation
```

```
Wakeall <- combine(Wake1, Wake2, Wake4, Wake5, WakeHomeless1, WakeHomeless3, WakeHomeless4, WakeHomeless5)  
select(voter_status_desc, voter_status_reason_desc, last_name, first_name, race_code, res_street_address)
```

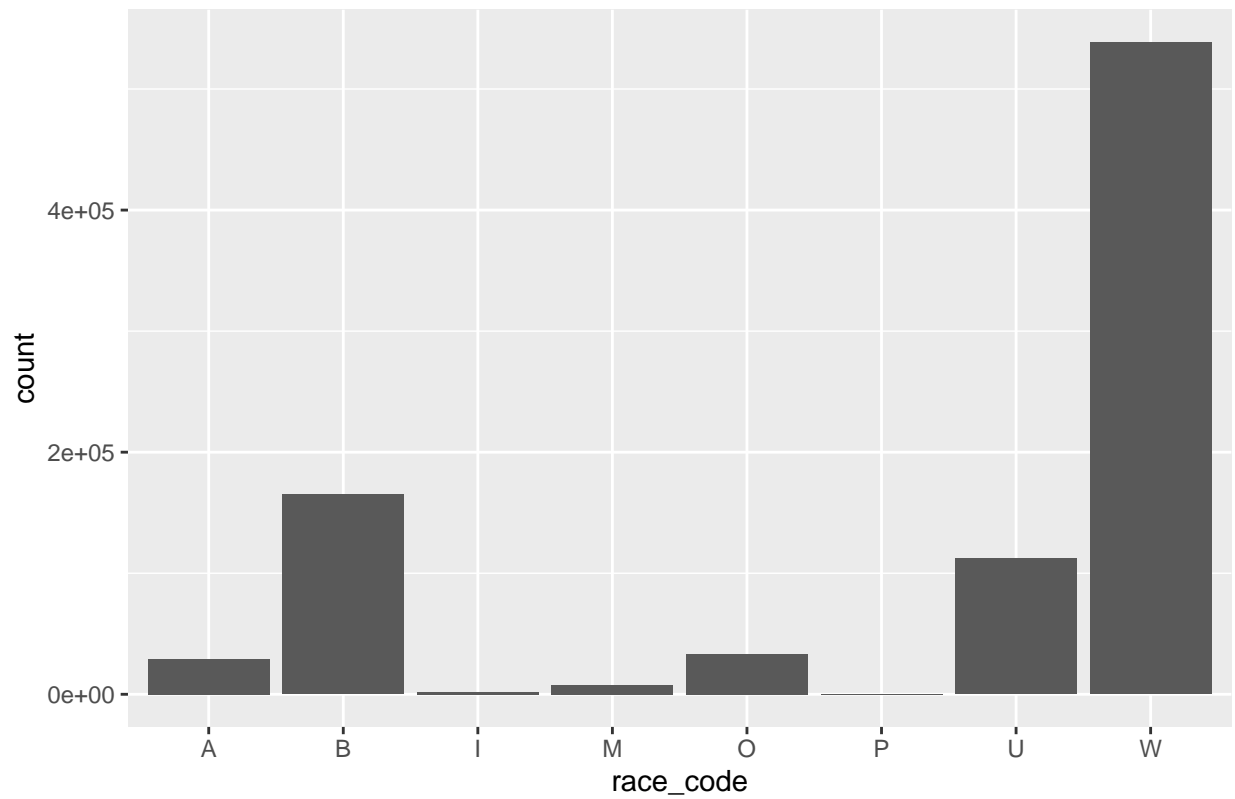
```
## Warning: 'combine()' was deprecated in dplyr 1.0.0.  
## Please use 'vctrs::vec_c()' instead.
```

```
Wake_demographics <- WakeCounty %>%  
  select(voter_status_desc, voter_status_reason_desc, last_name, first_name, race_code, res_street_address)
```

```
# Whole Wake county race composition
```

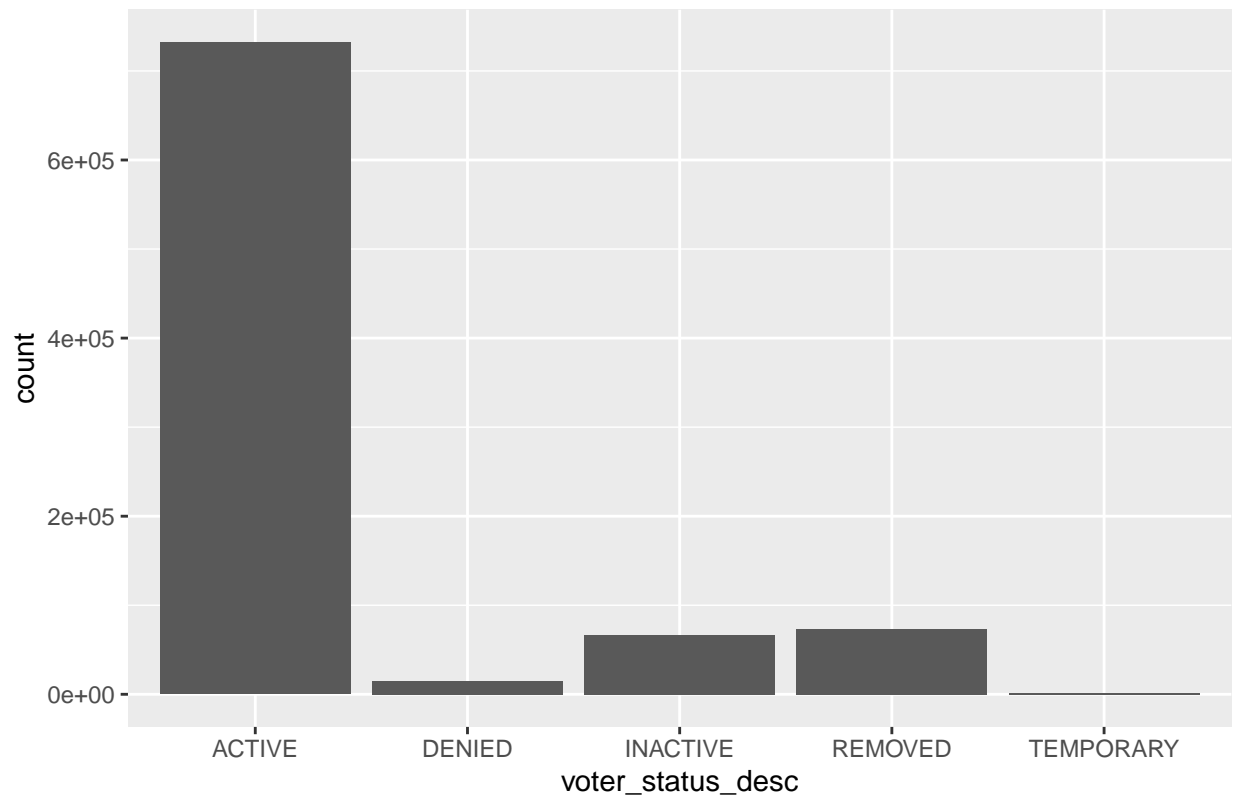
```
ggplot(data = Wake_demographics, mapping = aes(x = race_code)) +  
  geom_bar() +  
  ggtitle("Wake's Racial Composition")
```

Wake's Racial Composition



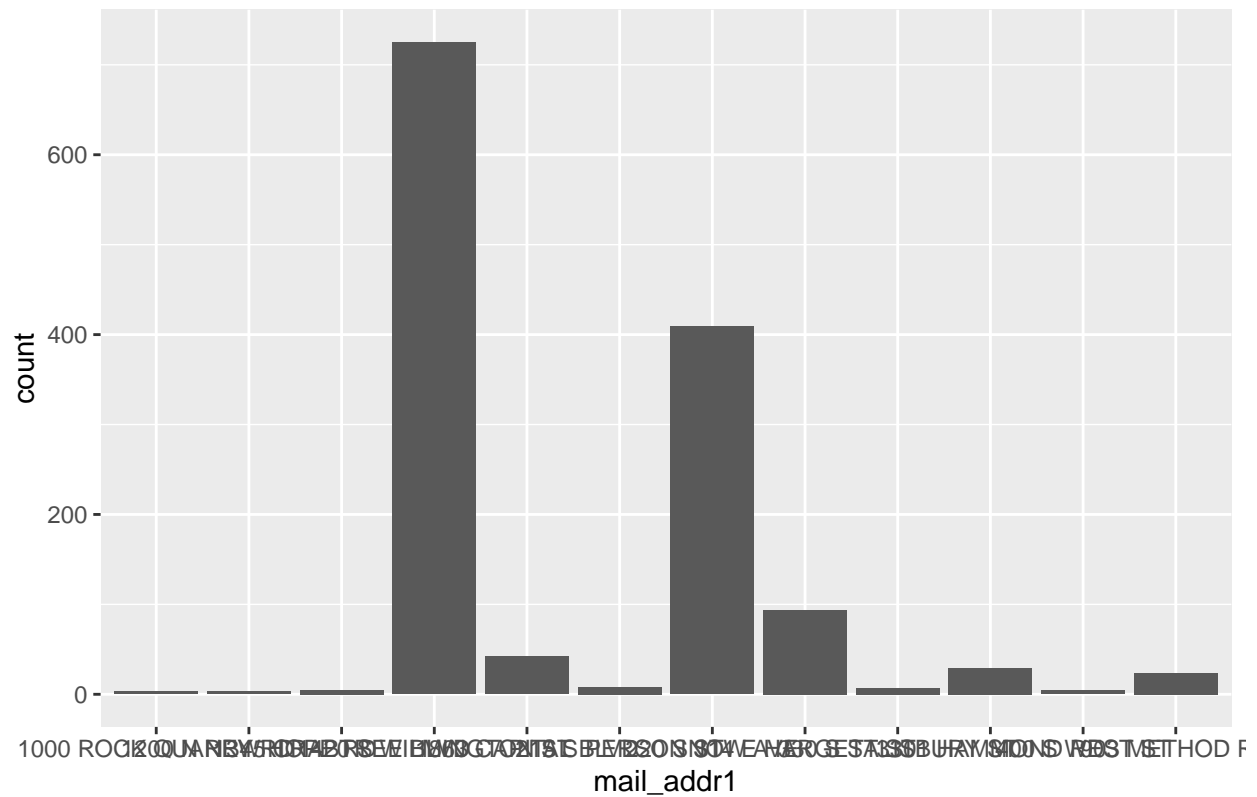
```
# Whole Wake county voter statuses
ggplot(data = Wake_demographics, mapping = aes(x = voter_status_desc)) +
  geom_bar() +
  ggtitle("Wake's Voter Statuses")
```


Wake's Voter Statuses



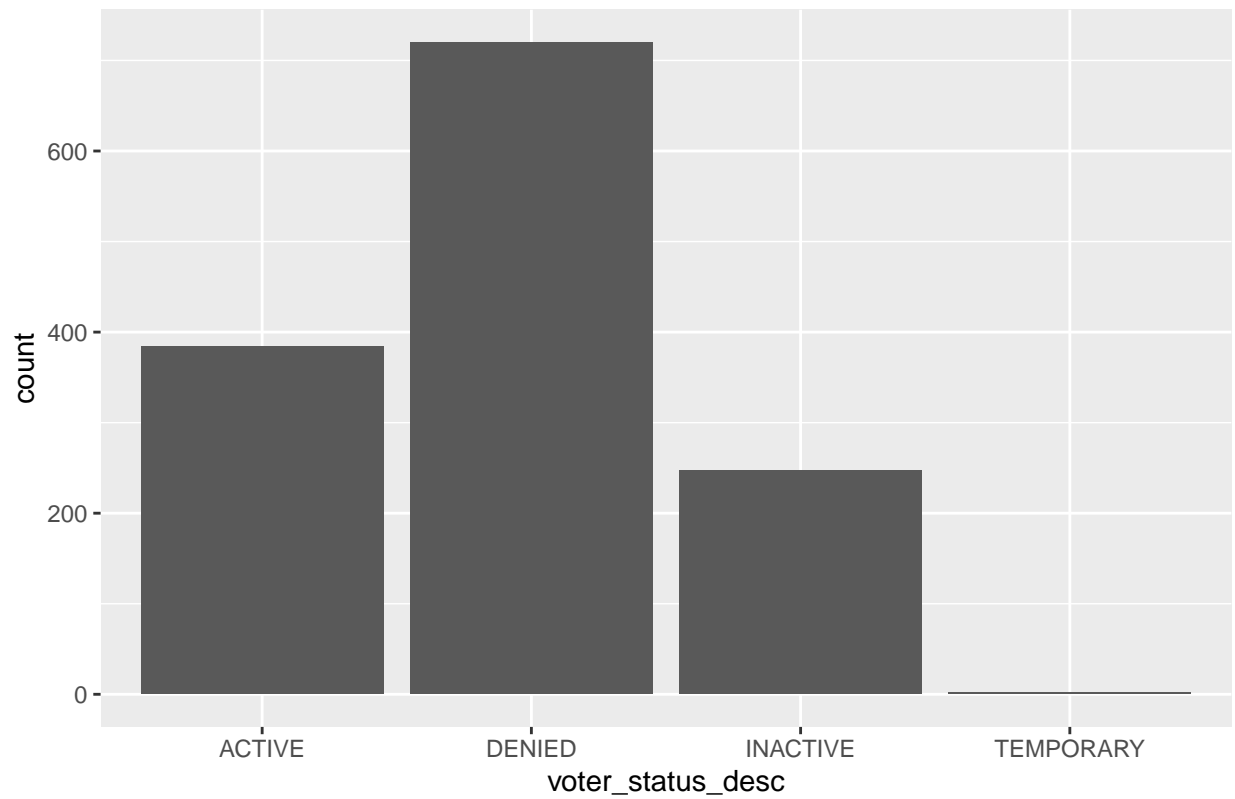
```
# Wake county jails and shelters registration occurrences  
ggplot(data = Wakeall, mapping = aes(x = mail_addr1)) +  
  geom_bar() +  
  ggtitle("Jail and Shelter Registrations")
```

Jail and Shelter Registrations



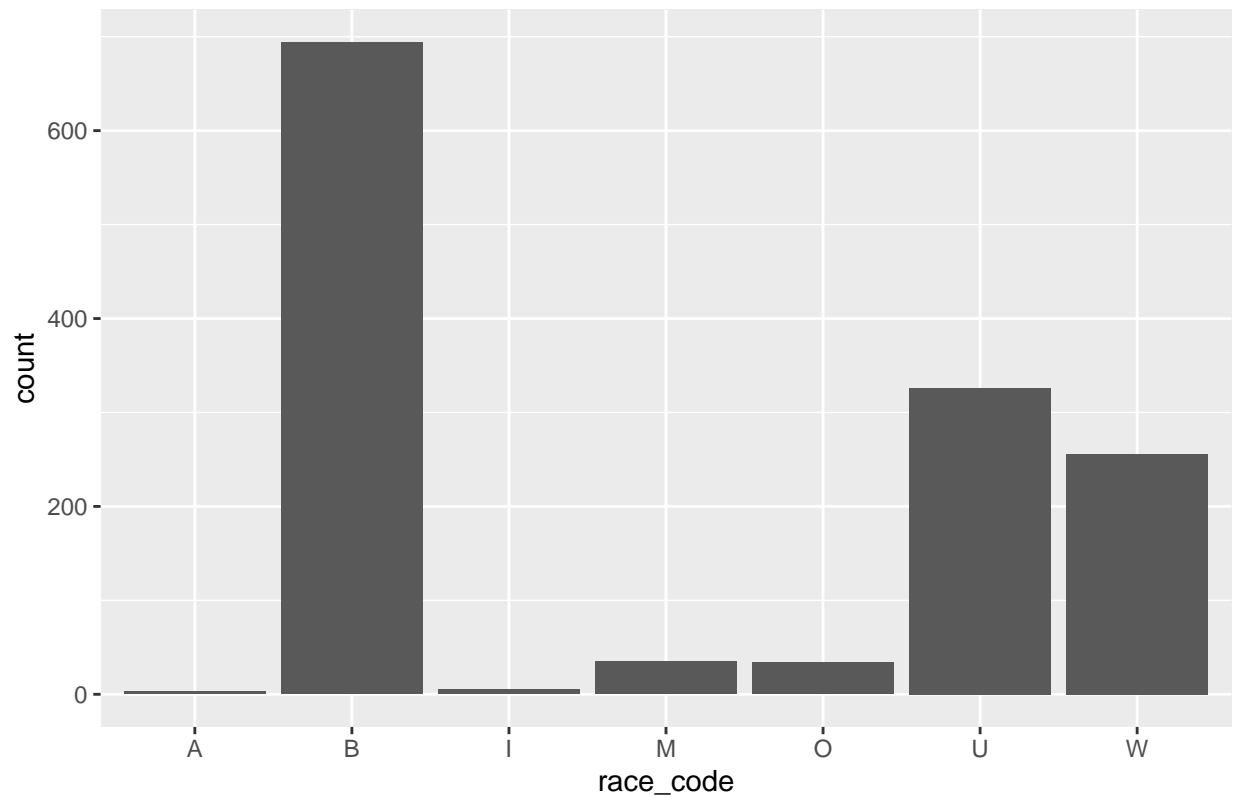
```
# Homeless and Jail voter statuses
ggplot(data = Wakeall, mapping = aes(x = voter_status_desc)) +
  geom_bar() +
  ggtitle("Transient Voter Statuses")
```

Transient Voter Statuses



```
# Homeless and Jail voter race composition  
ggplot(data = Wakeall, mapping = aes(x = race_code)) +  
  geom_bar() +  
  ggtitle("Transient Voter Racial Composition")
```

Transient Voter Racial Composition

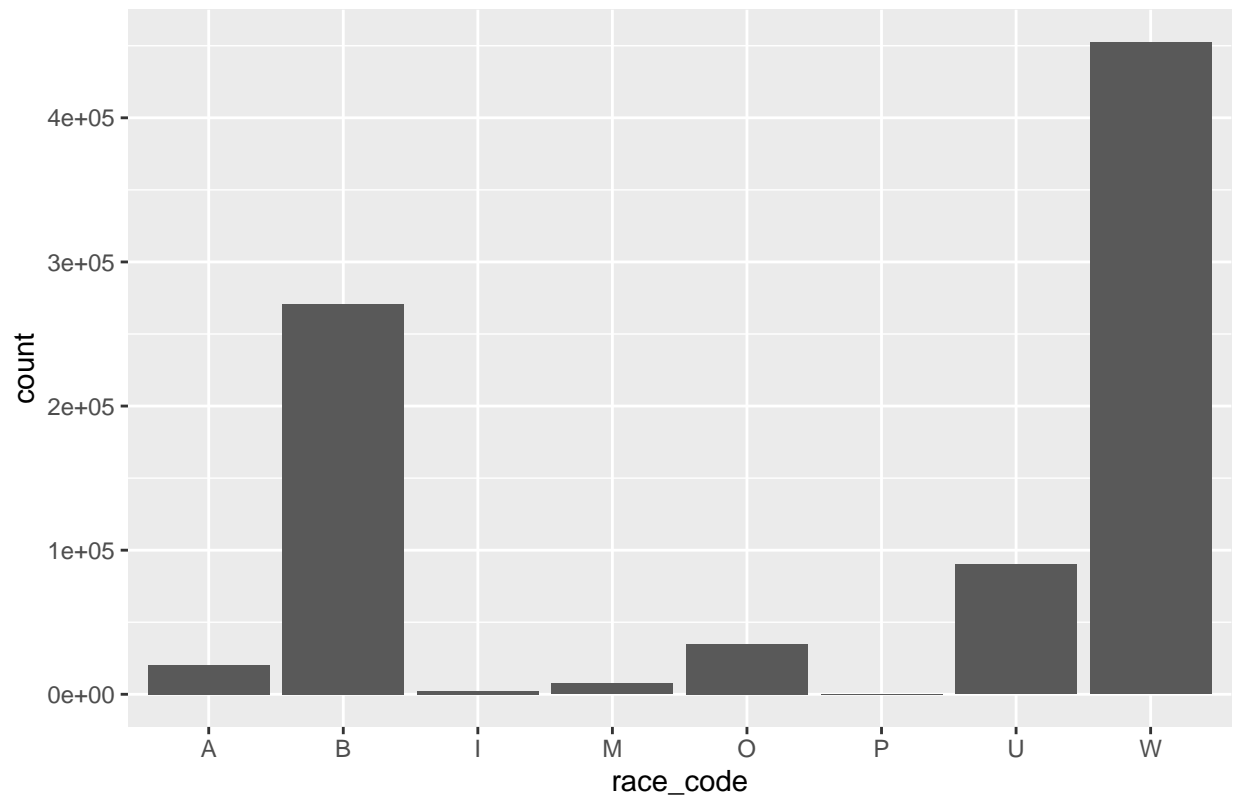


```
# only the addresses that had at least one observation
Mecklenburgall <- combine(Mecklenburg1, Mecklenburg2, MecklenburgHomeless2, MecklenburgHomeless3, MecklenburgHomeless4)
select(voter_status_desc, voter_status_reason_desc, last_name, first_name, race_code, res_street_address)

Mecklenburg_demographics <- Mecklenburgall %>%
  select(voter_status_desc, voter_status_reason_desc, last_name, first_name, race_code, res_street_address)

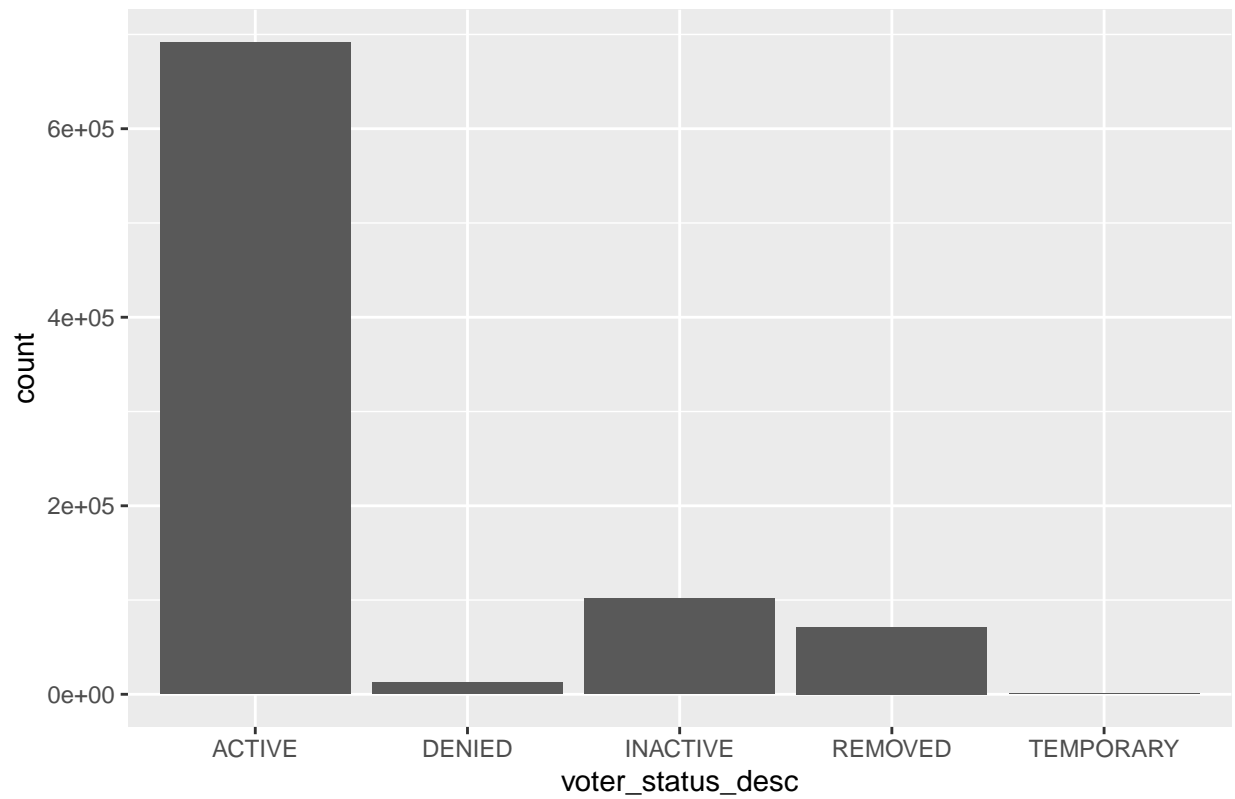
# Whole Mecklenburg county race composition
ggplot(data = Mecklenburg_demographics, mapping = aes(x = race_code)) +
  geom_bar() +
  ggtitle("Mecklenburg Racial Composition")
```

Mecklenburg Racial Composition



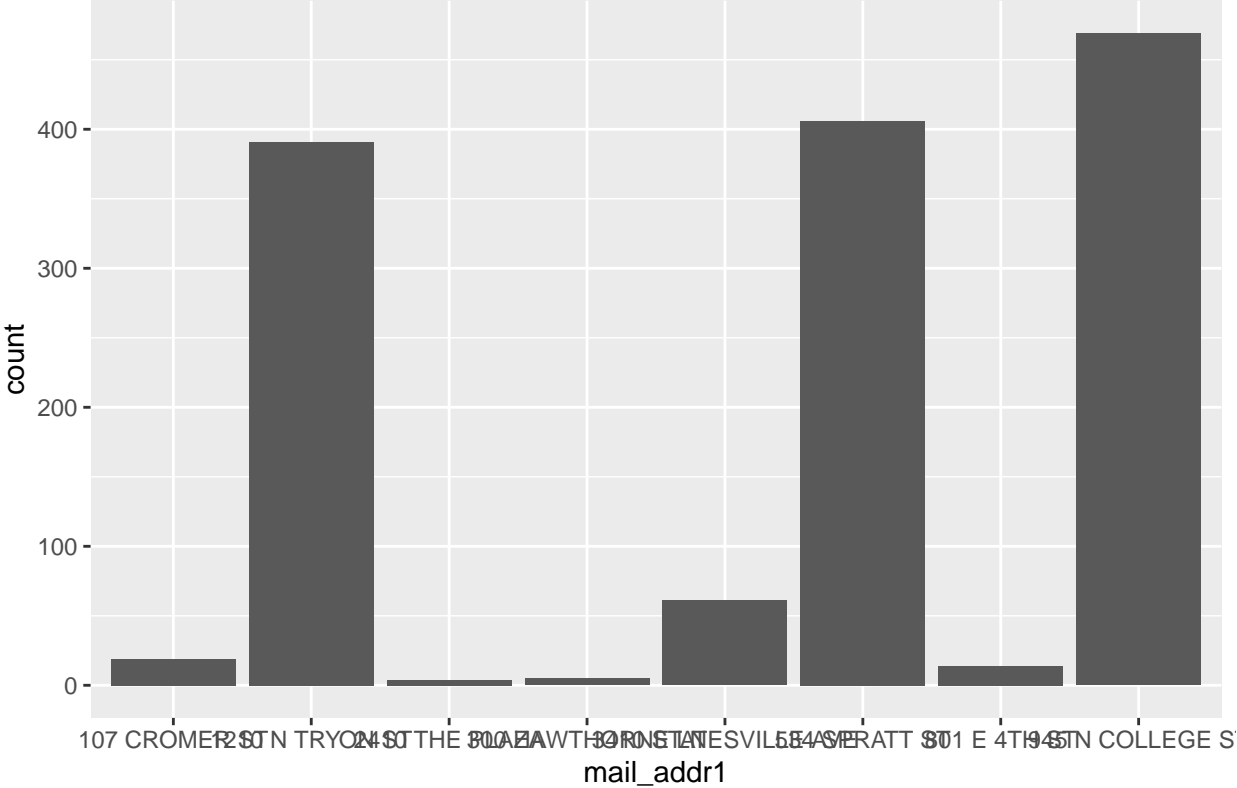
```
# Whole Mecklenburg county voter statuses
ggplot(data = Mecklenburg_demographics, mapping = aes(x = voter_status_desc)) +
  geom_bar() +
  ggtitle("Mecklenburg Voter Statuses")
```

Mecklenburg Voter Statuses



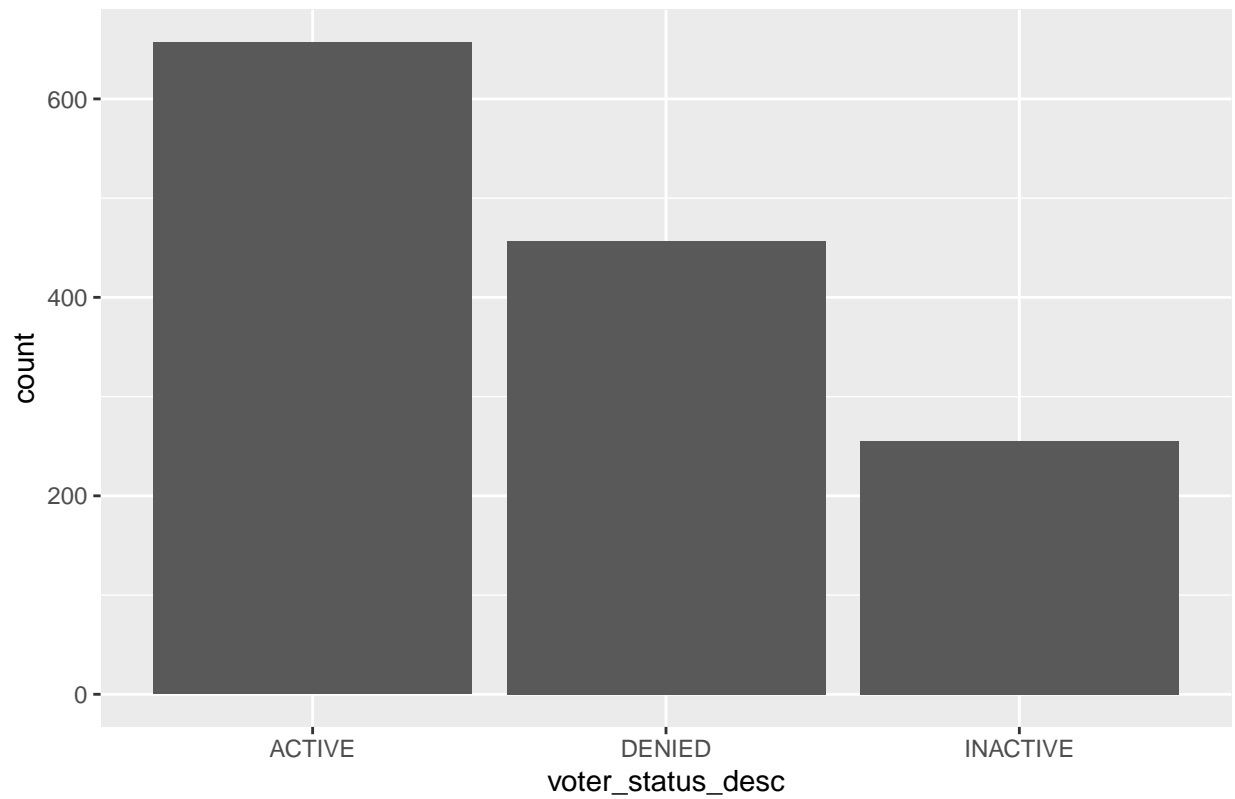
```
# Mecklenburg county jails and shelters registration occurrences
ggplot(data = Mecklenburgall, mapping = aes(x = mail_addr1)) +
  geom_bar() +
  ggtitle("Jail and Shelter Registrations")
```

Jail and Shelter Registrations



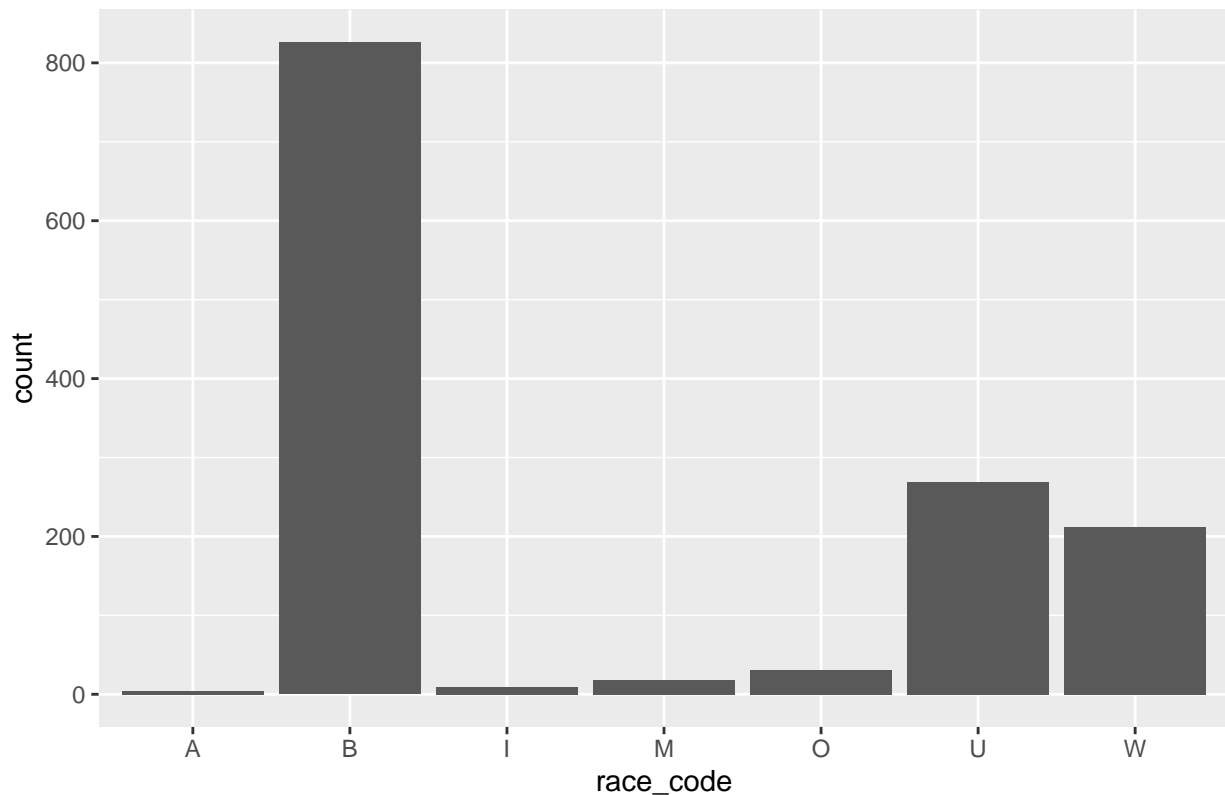
```
# Homeless and Jail voter statuses
ggplot(data = Mecklenburgall, mapping = aes(x = voter_status_desc)) +
  geom_bar() +
  ggtitle("Transient Voter Statuses")
```

Transient Voter Statuses



```
# Homeless and Jail voter race composition  
ggplot(data = Mecklenburgall, mapping = aes(x = race_code)) +  
  geom_bar() +  
  ggtitle("Transient Racial Composition")
```


Transient Racial Composition



Comparing the ratios of race, and voter status from county wide and then transient registrations

```
Wakerace <- Wake_demographics %>%
  filter(race_code == "B")
WakeTRace <- Wakeall %>%
  filter(race_code == "B")
# WakeRace, 165k out of 887k registrations are Black = 18%
# Wake Transient Race, 694 out of 1353 registrations are Black = 51%

Mecklenburgrace <- Mecklenburg_demographics %>%
  filter(race_code == "B")
MecklenburgTRace <- Mecklenburgall %>%
  filter(race_code == "B")
# Meckrace, 271k out of 878k registrations are Black = 30%
# Meck Transient Race, 826 out of 1369 registrations are Black = 60%

Wakedenied <- Wake_demographics %>%
  filter(voter_status_desc == "DENIED")
WakeTDenied <- Wakeall %>%
  filter(voter_status_desc == "DENIED")
# Wakedenied, 15k out of 887k registrations were denied = 1.6%
# Wake Transient Denied, 720 out of 1353 registrations denied = 53%

Mecklenburgdenied <- Mecklenburg_demographics %>%
  filter(voter_status_desc == "DENIED")
MecklenburgTDenied <- Mecklenburgall %>%
```

```
filter(voter_status_desc == "DENIED")  
# Meck Denied, 12.5k out of 878k registrations denied = 1.5%  
# Meck Transient Denied, 457 out of 1369 registrations = 33%
```

In this project I aim to expand on transient voter registration. Transient voters are often victims of poverty and or the criminal justice system. I attempt to observe their registration by checking registrations under jail, prison, elections offices, and homeless shelter addresses. I expect that these populations will be composed majorly of minority voters that suffer from a history of systemic oppression. Their position in society will disadvantage them and in turn lower their voting turnout. Observing transient registrations can show how communities are mobilizing these disadvantaged populations.

I have an interest in minorities and how they are impacted by the political institutions surrounding them. Because of institutionalized racism, many minorities and especially Blacks are caught in a cycle of poverty and incarceration. These cycles cause decreased voting participation, representation, and mobilization. My own honors thesis looks into this realm of voter participation in Alachua county, Florida. Poverty is a frequent cause for homelessness. In North Carolina, unless a person is serving a prison sentence for a felony they are able to vote. Homeless, incarcerated, and former felon registrations are interesting statistics I want to look at to further develop my understanding of how affected communities get civically engaged. I chose North Carolina because of its accessible data and previous work with state data in the class. I chose to focus on Wake and Mecklenburg data because they are the largest two counties in the state, with over 2 million residents across both.

I used public data from the North Carolina elections website. The state-wide data file was too large to load into R, so I changed my focus from state-wide to county level data. Wake county's data included about 887k observations, and Mecklenburg county's data had 878 observations. Both of these files included non-active voters that may potentially have been or will be purged from the system. The data is potentially non-conclusive of who is registered and may change every so often when the state does its regular purges of inactive voters.

I use the same theory that I am using for my honors thesis, about mobilization and voter turnout. The sense of trust that individuals have with the government rely on experiences of personal and proximal contact, terms coined by Dr. Hannah Walker in her book *Mobilized by Injustice*. Personal contact encompasses personal experiences with the criminal justice system. Proximal contact includes vicarious experiences with the system including knowing people who have had personal contact or having a community impacted by the system. These experiences shape how a person will view the system, their trust, and if or how they mobilize. Those that have been incarcerated or are homeless are more likely to not mobilize and have a lower turnout. With registration efforts made by political campaigns or community organizers, homeless and jail registrations increase. I wanted to observe how many, if any, registrations occur at county property or homeless shelters. This can be a measure for what kind of mobilization efforts currently exist in these counties. Walker argues that personal and proximal contact is necessary for political trust and choices to mobilize. She describes that those who mobilize are likely doing so because of their previous experiences inspiring them to take action to create change in their communities. Dr. Traci Burch in her book *Trading Democracy for Justice* argues that overall, incarceration and disadvantaged communities suffer from an overall decrease in participation and demobilization.

The first challenge I faced was obtaining and choosing the correct data files. I wanted registration data that included the addresses of those registering. At first I attempted to read in a file for statewide registration that was too large for my R. I chose to observe county data instead. By switching to county data, I was able to observe a significant amount of North Carolina voters from some of the most populated areas. I originally wanted to create a map visualizing the different points of the shelters and jails in these counties. I was able to create maps showing what the counties look like, but not more detailed than that. Another challenge I have faced is that something with my R does not like to work with me half the time. There are two address columns in the North Carolina data, `res_street_address` and `mail_addr1`, and they both have the same entries the majority of the time. Sometimes when filtering the data for one column there are no observations that come up but when I switch to the other column it works. So far there has been no consistency for which one will work when I face this issue. By recognizing when it was odd to have no observations, I was able

to switch my filter to the second address column. It was hard to recognize what the issue was at first, but now that I have had experience with. When filtering for data in Mecklenburg county, there were no results and I concluded at first that there were no jail or homeless registrations in that county. receiving desired results from tweaking the filter I know what to look for. With another attempt at looking for shelter and jail addresses in the Mecklenburg data, something did come up and it made me ecstatic. Another issue I have faced is the failure of my tidyverse package to load. I attempted to search up solutions, and nothing worked. I updated all of my packages, I restarted my R, I restarted my computer and it still refused to work. After taking a break and attempting again the next day I thought of uninstalling and reinstalling tidyverse. This seemed to work and I was able to continue working on my project.

By manually filtering for registered addresses of jails, prisons, Supervisor of Elections offices, and homeless shelters I received over 2700 registrations. I refer to these registrations as transient voters, since they are not registering in a personal residence. In Wake county, there were 1353 registrations that fit what I looked for, and 1369 in Mecklenburg county. In Wake county, the bulk of registrations came from two homeless shelters with 725 from one shelter and 409 registrations from the other. This shows a clear mobilization effort to register homeless citizens of Wake county residing in these shelters. In Mecklenburg there were three shelters that made up the bulk of the registrations with 469, 391, and 406, respectively. While These people were able to get registered, North Carolina practices strict voter registration upkeep. This includes purging inactive or unverified voters from the system, requiring voters to reregister if purged. Most transient voters most likely have backgrounds with poverty, housing instability, and are more likely to be minorities.

In Wake county out of all registrations on the file 18% are Black, and 1.6% were denied registration. Of just the transient population in Wake county 51% are Black and 53% were denied registration. This shows that there is a disproportionate amount of transient voters are Black, and that transient voters are denied registration at a much higher rate than the county average. The transient population in Wake county is majority Black and their registrations are denied a majority of the time. The denial of registrations can be caused by transient voters not being able to be kept track of by the county for verification. In Mecklenburg county out of all registrations on the file 30% are Black, and 1.5% were denied registration. Of just the transient population in Mecklenburg 60% are Black and 33% were denied registration. This again shows the disproportionate amount of transient voters are Black, and that their registrations are also denied at a much higher rate than the county average.

I was able to observe transient voter registration in North Carolina counties Wake and Mecklenburg by searching for specific addresses in the voter file. There are over three thousand individuals that have registered under county addresses or shelters. These individuals fit my expectation of being majority minorities. With expected decreased voter engagement from these populations, they are also prevented from participating because their registrations are denied at a significantly high rate. A third or even more than half of transient registrations are denied. These populations often suffer from poverty and systemic oppression which are demotivators for political participation. These oppressors are forms of voter suppression as many are forced to jump through hoops to be able to register and participate.