R Notebook

Getting Postcode and Parish from Police Data lat/lon (locations), using postcodes API

Getting packages ready ...

```
#install.packages("rio")
library("rio")
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("jsonlite")
```

Loading the CSV file

```
df <- rio::import("2020-08-derbyshire-stop-and-search.csv")
```

Poking around, getting column names and a glimple at the datas

```
names(df)
```

```
##  [1] "Type"
##  [2] "Date"
##  [3] "Part of a policing operation"
##  [4] "Policing operation"
##  [5] "Latitude"
##  [6] "Longitude"
##  [7] "Gender"
##  [8] "Age range"
##  [9] "Self-defined ethnicity"
## [10] "Officer-defined ethnicity"
## [11] "Legislation"
## [12] "Object of search"
## [13] "Outcome"
## [14] "Outcome linked to object of search"
## [15] "Removal of more than just outer clothing"
```

```
head(df)
```

```
##                         Type               Date Part of a policing operation
## 1             Person search 2020-08-01 02:15:00                           NA
```

```
## 2 Person and Vehicle search 2020-08-01 13:26:00                          NA
## 3             Person search 2020-08-01 16:08:00                          NA
## 4             Person search 2020-08-01 22:00:00                          NA
## 5             Person search 2020-08-01 22:00:00                          NA
## 6             Person search 2020-08-02 14:55:00                          NA
##   Policing operation Latitude Longitude Gender Age range
## 1                 NA 52.91919 -1.465285   Male   over 34
## 2                 NA 53.46335 -1.967683   Male     25-34
## 3                 NA 52.92196 -1.475678   Male   over 34
## 4                 NA 52.89447 -1.413371   Male     10-17
## 5                 NA 52.89447 -1.413371 Female     10-17
## 6                 NA 52.92196 -1.475678   Male   over 34
##                                 Self-defined ethnicity
## 1 White - English/Welsh/Scottish/Northern Irish/British
## 2 White - English/Welsh/Scottish/Northern Irish/British
## 3                       Other ethnic group - Not stated
## 4 White - English/Welsh/Scottish/Northern Irish/British
## 5 White - English/Welsh/Scottish/Northern Irish/British
## 6                       Other ethnic group - Not stated
##   Officer-defined ethnicity                                    Legislation
## 1                     White Police and Criminal Evidence Act 1984 (section 1)
## 2                     White            Misuse of Drugs Act 1971 (section 23)
## 3                     White            Misuse of Drugs Act 1971 (section 23)
## 4                     White            Misuse of Drugs Act 1971 (section 23)
## 5                     White            Misuse of Drugs Act 1971 (section 23)
## 6                     White            Misuse of Drugs Act 1971 (section 23)
##           Object of search                      Outcome
## 1 Article for use in theft A no further action disposal
## 2         Controlled drugs     Khat or Cannabis warning
## 3         Controlled drugs A no further action disposal
## 4         Controlled drugs A no further action disposal
## 5         Controlled drugs A no further action disposal
## 6         Controlled drugs A no further action disposal
##   Outcome linked to object of search Removal of more than just outer clothing
## 1                               TRUE                                    FALSE
## 2                               TRUE                                    FALSE
## 3                               TRUE                                    FALSE
## 4                               TRUE                                    FALSE
## 5                               TRUE                                    FALSE
## 6                               TRUE                                    FALSE
```

Adding a column of the postcodes api with the lat/lon argument taken from the dataframe (for each row)

```
df$url <- paste("http://api.postcodes.io/postcodes?lat=", df$Latitude, "&lon=", df$Longitude, sep="")
head(df$url)
```

```
## [1] "http://api.postcodes.io/postcodes?lat=52.919189&lon=-1.465285"
## [2] "http://api.postcodes.io/postcodes?lat=53.46335&lon=-1.967683"
## [3] "http://api.postcodes.io/postcodes?lat=52.921959&lon=-1.475678"
## [4] "http://api.postcodes.io/postcodes?lat=52.894466&lon=-1.413371"
## [5] "http://api.postcodes.io/postcodes?lat=52.894466&lon=-1.413371"
## [6] "http://api.postcodes.io/postcodes?lat=52.921959&lon=-1.475678"
```

Some rows have no location ... let's filter them out

```
df <- df %>% filter(!is.na(Latitude))
```

Here is the meat. Loop on the urls, execute the API, extract postcode and parish and integrate back into dataframe as new columns

```
postcodes = c()
parishes = c()
for ( url in df$url ) {
  json = read_json(url)
  postcode = json$result[[1]]$postcode
  parish = json$result[[1]]$parish
  if ( (json$status == 200) && !is.null(postcode) ) {
    postcodes <- append(postcodes, postcode)
    parishes = append(parishes, parish)
  } else {
    postcodes <- append(postcodes, "unknown")
    parishes <- append(parishes, "unknown")
  }
}
df$postcode = postcodes
df$parish = parishes
```

Some basic analysis, say how many rows (incedents) were there for each parish

```
df %>% count(parish)
```

```
##                                parish  n
## 1                              Belper  3
## 2                            Breaston  1
## 3      Chesterfield, unparished area  5
## 4                              Clowne  2
## 5             Derby, unparished area 66
## 6          Draycott and Church Wilne  6
## 7                             Duffield  1
## 8           Erewash, unparished area 11
## 9                   Heanor and Loscoe  5
## 10        High Peak, unparished area  5
## 11                         Killamarsh  1
## 12                       Matlock Town  3
## 13                           Overseal  1
## 14                             Sawley  1
## 15                          Scarcliffe  1
## 16          Shardlow and Great Wilne  1
## 17               Shirland and Higham  2
## 18 South Derbyshire, unparished area  2
## 19                            unknown 11
## 20                         Wingerworth  2
## 21                            Winshill  1
```