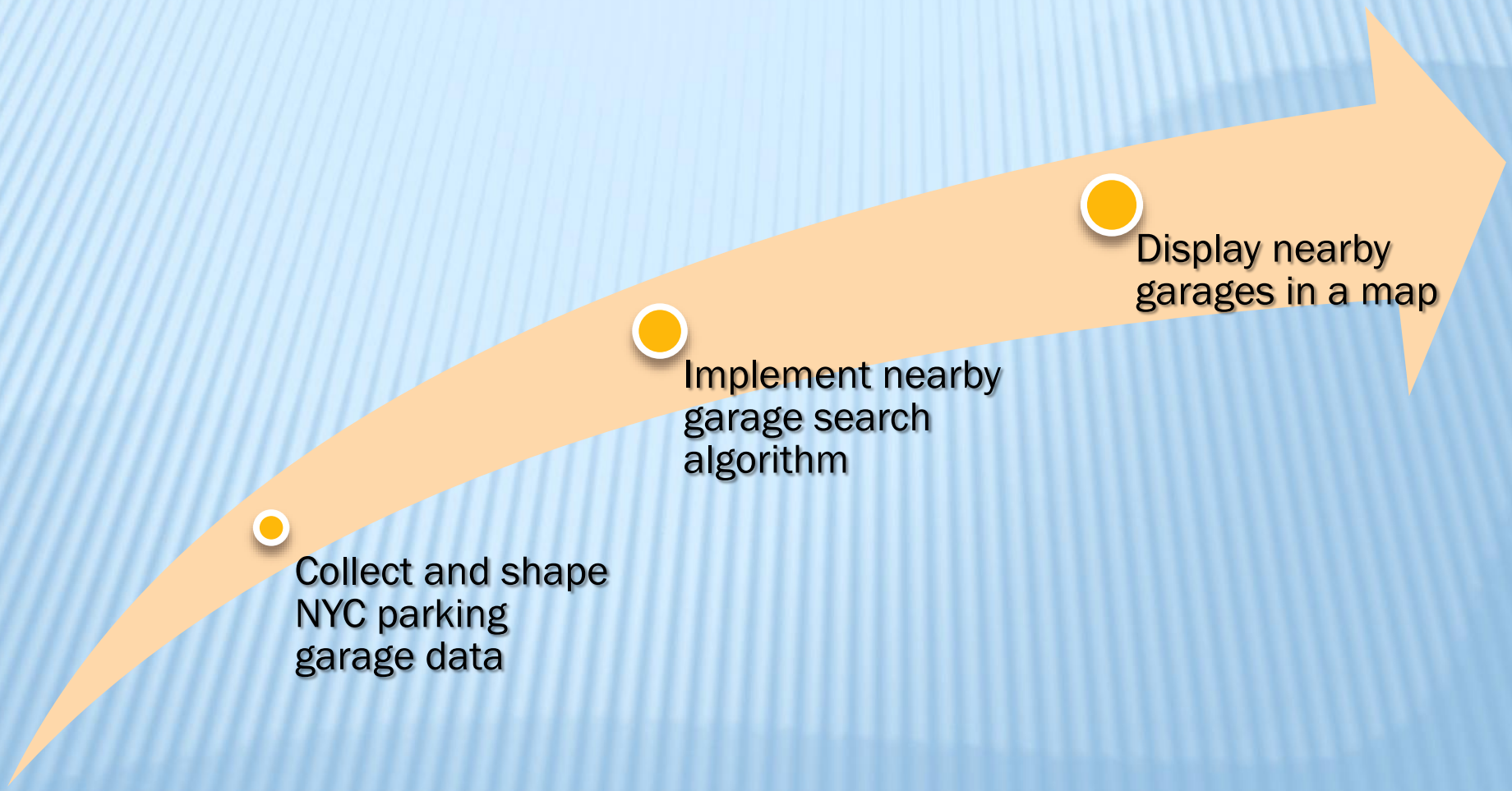
Locating Parking Garages in NYC
CUNY School of Professional Studies
Sharad Gurung

PROJECT OVERVIEW

OVERVIEW

- Demonstration of a simple mash-up technique in R
- Combine NYC Parking Garage data from NYC OpenData with Google Maps
- Implement a simple algorithm to find nearby parking locations
- Display parking locations in a static Google map image
- Packages: plyr, Imap, and RgoogleMaps

PROJECT GOALS



DATA COLLECTION

- NYC Parking Garage data is available at NYC OpenData portal
- CSV format selected for simplicity
- Latitude and Longitude extracted from Address field
- Garage classification depends on Number Of Spaces field
- Cleaned/shaped data saved for later use

For more info . . .
https://data.cityofnewyork.us/Transportation/NYC-Parking-Spots/nxab-ch29

DATA MANAGEMENT

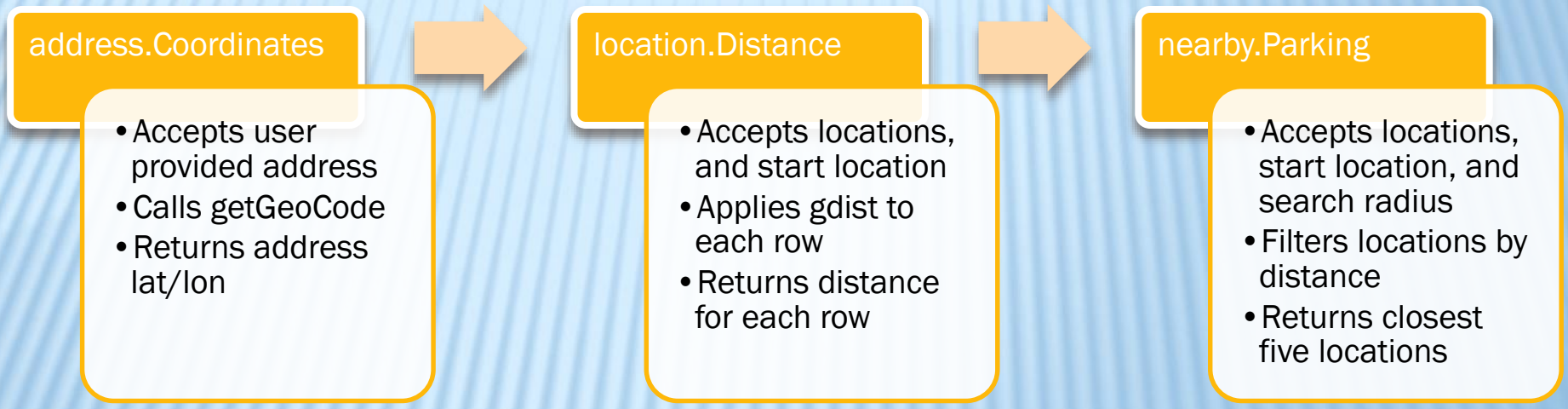
Pros	Cons	Opportunity
• Quality • Accuracy • Uniqueness • Full Address • Number of Spaces	• Missing trade name • Data structure • Poor formatting	• Mash-up rate data • Mash-up vacancy data • Spaces Classification

DATA MANAGEMENT CHALLENGE

CHALLENGE	SOLUTION
Extract latitude and longitude from address field. Example: 511 25 WEST 18 STREET NEW YORK, NY 10011 (40.74471526669623, -74.00460000028977)	ldply(FullAddress, function(address) { split = unlist(strsplit(address, "\n", fixed = TRUE)) coord = split[3] coord = sub("\\(", "", coord) coord = sub("\\)", "", coord) split = unlist(strsplit(coord, ",")) return (data.frame(lon=split[2], lat=split[1])) })
Classify parking locations by number of spaces	y = quantile(nyc$Spaces, c(.8,.6,.4,.2)) nyc$Qtle[nyc$Spaces >= y[1]] = "1" nyc$Qtle[nyc$Spaces < y[1] & nyc$Spaces >= y[2]] = "2" nyc$Qtle[nyc$Spaces < y[2] & nyc$Spaces >= y[3]] = "3" nyc$Qtle[nyc$Spaces < y[3] & nyc$Spaces >= y[4]] = "4" nyc$Qtle[nyc$Spaces < y[4]] = "5"

NOTE: Code was refactored to fit the slide! Please refer to github for complete code.

NEARBY GARAGE ALGORITHM



ALGORITHM CONTINUED

- Location.distance
  - apply(locations, 1, function(location) { gdist(lon.1=longitude, lat.1=latitude, lon.2=as.numeric(location["lon"]), lat.2=as.numeric(location["lat"]), units="miles")})
- Nearby.Parking
  - matches = locations[locations$distance < searchRadius,];
  - matches = matches[order(matches$distance),];
  - return (na.omit(matches[1:max.Locations,]));

DYA: Define your acronyms!

DISPLAY NEARBY GARAGE

GetMap

- Get static map
- Center on destination
- Zoom based on location range
- Size 640 by 640

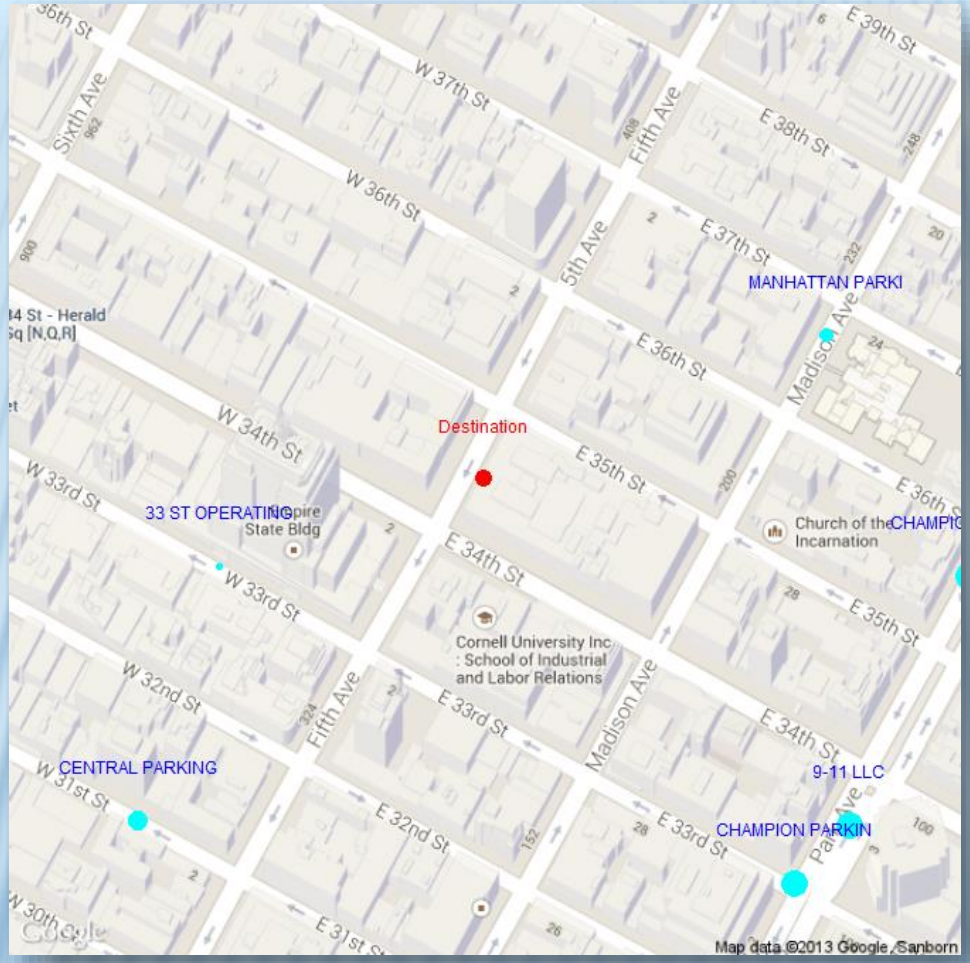
PlotOnStaticMap

- Size: Depends on Number of Spaces
- Color: cyan

TextOnStaticMap

- Size: Customizable
- Location: Above plot image
- Color: Blue
- Text Width: Customizable

FINAL RESULT



FURTHER ENHANCEMENTS

- Mash-up vacancy data
- Mash-up rates data
- Implement web service

REFERENCE

- Complete Code at https://github.com/sharadgit/IS607/Final