Supplemental Digital Content

Python Code to Retrieve the Google Driving Times

The Python v3.4.4 code used to prospectively determine the Google Distance Matrix driving times is located at https://FDshort.com/SurgeonClinic

Modifications to the code are required for the following fields:

# rename the output.csv files with more descriptive names
filename1 = 'c:/output1.csv'
filename2 = 'c:/output2.csv'
filename3 = 'c:/output3.csv'
filename4 = 'c:/output4.csv'

# enter your Google API Distance Matrix api_key here
# this can be obtained from
# https://developers.google.com/maps/documentation/distance-matrix/get-api-key
api_key = '{enter api key}'

# enter the gps coordinates of up to 4 locations
gps1 = '34.155668,-118.471960'   # location 1
gps2 = '34.177514,-118.865022'   # location 2
gps3 = '34.065972,-118.446519'   # location 3
gps4 = '34.027418,-118.486156'   # location 4

# describe routes; modify text as appropriate
route1 = 'Location1 to Location 3'
route2 = 'Location2 to Location 3'
route3 = 'Location1 to Location 2'
route4 = 'Location1 to Location 2'

# local start and end time in hours
startdriving_hour = 9       # 9 = 9 AM local time where the driving occurs; modify as desired
enddriving_hour = 16  # 16 = 4 PM local time where the driving occurs; modify as desired

# interval between checking the driving times
check_time_interval = 300   # of seconds between checking the driving time

# In each of the 4 sections calling the distance matrix api, adjust the test for the locations to match the routes above.

# driving time from gps1 to gps3. modify if another pair is to be considered here
url="https://maps.googleapis.com/maps/api/distancematrix/json?units=imperial&origins="+gps1+'&destinations="+gps3+'&mode=driving&traffic_model=best_guess&departure_time=now&key="+api_key
Application of the Median Driving Time between 12:00 PM and 13:55 PM + 10 minutes over a 4-week period to estimate the maximum time to allow for timely arrival when driving between a clinic and a facility with operating rooms.

Supplemental Figure. Maximum driving times according to the hour of departure between the origin-destination pairs listed. UI = University of Iowa Hospitals and Clinics; CR = Mercy Medical Center Cedar Rapids; UCLA = Ronald Reagan UCLA Medical Center; SM = UCLA Medical Center, Santa Monica; E = UCLA Specialty Clinic, Encino; TO = UCLA Specialty Clinic, Thousand Oaks. Driving times listed are the maximum driving times recorded during each 15 minute epoch among all days of the week over a 4-week period from May 9, 2018, through June 6, 2018.
**Supplemental Digital Content**

**Supplemental Table A. Fraction of days when median driving time between 12:00 PM and 12:55 PM was less than the maximum driving time between 10:00 AM and 13:55 PM**

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Median Driving Time</th>
<th># Days Where Median + 10 Minutes &lt; Maximum Driving Time from 10:00 AM to 13:55 PM</th>
<th>Total Days Evaluated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa City Hospitals and Clinics</td>
<td>Mercy Medical Center Cedar Rapids</td>
<td>35.6</td>
<td>0 / 20</td>
<td></td>
</tr>
<tr>
<td>Mercy Medical Center Cedar Rapids</td>
<td>Iowa City Hospitals and Clinics</td>
<td>36.8</td>
<td>0 / 20</td>
<td></td>
</tr>
<tr>
<td>UCLA Specialty Clinic, Encino</td>
<td>Ronald Reagan UCLA Medical Center</td>
<td>30.8</td>
<td>0 / 20</td>
<td></td>
</tr>
<tr>
<td>UCLA Specialty Clinic, Encino</td>
<td>UCLA Medical Center, Santa Monica</td>
<td>38.7</td>
<td>0 / 20</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: UCLA, University of California, Los Angeles;
Distribution Fits from Plantation to UMH: Fri 10AM

Distribution Fits from Plantation to UMH: Fri 11AM

Distribution Fits from Plantation to UMH: Fri 12pm

Distribution Fits from Plantation to UMH: Fri 1PM

CDF

Travel Time (min)

Burr

lognormal

CDF

Travel Time (min)

Burr

lognormal

CDF

Travel Time (min)

Burr

lognormal

CDF

Travel Time (min)

Burr

lognormal
Distribution Fits from Plantation to UMH: Mon 10AM

Distribution Fits from Plantation to UMH: Mon 11AM

Distribution Fits from Plantation to UMH: Mon 12pm

Distribution Fits from Plantation to UMH: Mon 1PM
Distribution Fits from Plantation to UMH:

- **Thursday 10AM**
  - The plots show the cumulative distribution function (CDF) of travel times, with black solid line representing the Burr distribution and the green dashed line representing the lognormal distribution.

- **Thursday 11AM**
  - Similar to 10AM, with black solid line for Burr and green dashed line for lognormal.

- **Thursday 12PM**
  - Travel times are again represented with black solid line for Burr and green dashed line for lognormal.

- **Thursday 1PM**
  - The plots continue to display travel times with black solid line for Burr and green dashed line for lognormal.
Distribution Fits from UMH to Lennar: Mon 10AM

Distribution Fits from UMH to Lennar: Mon 11AM

Distribution Fits from UMH to Lennar: Mon 12pm

Distribution Fits from UMH to Lennar: Mon 1PM
Distribution Fits from UMH to Lennar: Fri 10AM

Distribution Fits from UMH to Lennar: Fri 11AM

Distribution Fits from UMH to Lennar: Fri 12pm

Distribution Fits from UMH to Lennar: Fri 1PM
CDF

Travel Time (min)

Distribution Fits from Lennar to UMH: Thu 10AM

Distribution Fits from Lennar to UMH: Thu 11AM

Distribution Fits from Lennar to UMH: Thu 12pm

Distribution Fits from Lennar to UMH: Thu 1PM

- Burr
- lognormal

Travel Time (min)