Homework 4

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Textbook Problems

Q7.2

Syntactic heterogeneity occurs when two or more information systems use incompatible encoding or formats for information. Semantic heterogeneity occurs when two or more information systems use different or in some way incompatible meanings. The distinction between synaptic and semantic heterogeneity mirrors the distinction between data and information. Syntactic heterogeneity is concerned with the properties of data, namely format and syntax of data. Semantic heterogeneity is concerned with the properties of information, primarily the context and meaning that we associate with data to form information. Syntactic heterogeneity is addressed by standards and transfer formats.

Q7,6

Active-proximity: rfid, GSM, mobile phone tracting,
Active-triangulation: global positioning system, distress radiobeacon, Active Bat
Passive-motion-tracking: flight data recorder
Passive-scene-analysis: matitme distress safety system

Q8.2

Interactive feedback, dynamic query (zooming, panning, focusing, and brushing),
three-dimensional are widely used in popular web-based mapping services. Animated interfaces are also used in Google Earth. Non-visual displays could be used for people have visual impairments. Assume a person with visual impairment want to find the direction to the nearest food market. Once he open the web-based map application, it will auto-locate the position of the person, and will prompt the user to enter the destination by realistic sound. After the person enter the name of store, the map application will calculate the route and read out the route turn by turn.

Q8.4

LineDrive maps provide the user a non-uniform scaling route map and only keep the minimum useful information, while common web-services provide user a uniform route map and all the information along with the route.
Under normal conditions, the LineDrive will provide user a more simplicity route map since users don’t need to worry to change routes. All the roads is visible and all ramps and intersections are maintained.
Under unusual conditions, common web-services would be better since user may need to change route frequently. The map needs to be able to provide as much details as possible. In this situation, non-uniform scaling may also make users confusing about choosing routes.

Lab 4

--2.How many nodes are in the network?

```
SELECT SDO_NET.GET_NO_OF_NODES('hennepin') FROM DUAL;
```

--3.What is the degree of node 40358?

```
SELECT SDO_NET.GET_NODE_DEGREE('hennepin', 40358) FROM DUAL;
```

--4.Find all nodes with an in degree of at least 4

```
SELECT n.NODE_ID FROM DUAL, hennepin_node$ n WHERE
SDO_NET.GET_NODE_IN_DEGREE('hennepin', n.NODE_ID) >= 4;
```

--5.What is the average out degree of all nodes in the network?

```
SELECT AVG(SDO_NET.GET_NODE_OUT_DEGREE('hennepin',n.NODE_ID)) AS avg_out_degree
FROM DUAL,hennepin_node$ n;
```

--6.Retrieve the travel times (TRANSIT_TIME) for link 300 with start time and end time occuring between 630 and 1020

```
SELECT TRANSIT_TIME from F12C5980G24.hennepin_transit_time where START_TIME >= 620
AND END_TIME <= 1020 AND TRANSIT_ID = 300;
```

--retrieve the travel times (TRANSIT_TIME) for link 300 with start time and end time occuring between 1230 and 1440

```
SELECT TRANSIT_TIME from F12C5980G24.hennepin_transit_time WHERE START_TIME >= 1230
AND END_TIME <= 1440 AND TRANSIT_ID = 300;
```

--7.What are the minimum and maximum travel times for link 1000

```
SELECT MIN(TRANSIT_TIME) as minimum_travel_time, MAX(TRANSIT_TIME) as
maximum_travel_time from F12C5980G24.hennepin_transit_time WHERE TRANSIT_ID = 1000;
```

--8.What is the travel time of the route consisting of links 130, 1476, 1478 and 738 between 705 and 930?

```
WITH route as (SELECT * from F12C5980G24.hennepin_transit_time WHERE (TRANSIT_ID = 130
or TRANSIT_ID = 1476 or
TRANSIT_ID = 1478 or TRANSIT_ID = 738) and START_TIME >=705 and END_TIME <= 930)
SELECT a.START_TIME as Start_130, a.END_TIME as End_130, b.START_TIME as Start_1476,
b.END_TIME as End_1476,
  c.START_TIME as Start_1478, c.END_TIME as End_1478, d.START_TIME as Start_738,
```

```
d.END_TIME as End_738,
  a.TRANSIT_TIME+b.TRANSIT_TIME+c.TRANSIT_TIME+d.TRANSIT_TIME as TOTAL_TRAVEL_TIME
  from route a, route b, route c, route d
  WHERE a.TRANSIT_ID = 130 and b.TRANSIT_ID = 1476 and c.TRANSIT_ID = 1478 and
d.TRANSIT_ID = 738
  and d.START_TIME >= c.END_TIME and c.START_TIME >= b.END_TIME and b.START_TIME >=
a.END_TIME;

--What is the travel time on the same route between 0 and 330?

  WITH route as (SELECT * from F12C5980G24.hennepin_transit_time WHERE (TRANSIT_ID = 130
or TRANSIT_ID = 1476 or
TRANSIT_ID = 1478 or TRANSIT_ID = 738) and START_TIME >=0 and END_TIME <= 300)
SELECT a.START_TIME as Start_130, a.END_TIME as End_130, b.START_TIME as Start_1476,
b.END_TIME as End_1476,
  c.START_TIME as Start_1478, c.END_TIME as End_1478, d.START_TIME as Start_738,
d.END_TIME as End_738,
  a.TRANSIT_TIME+b.TRANSIT_TIME+c.TRANSIT_TIME+d.TRANSIT_TIME as TOTAL_TRAVEL_TIME
  from route a, route b, route c, route d
  WHERE a.TRANSIT_ID = 130 and b.TRANSIT_ID = 1476 and c.TRANSIT_ID = 1478 and
d.TRANSIT_ID = 738
  and d.START_TIME >= c.END_TIME and c.START_TIME >= b.END_TIME and b.START_TIME >=
a.END_TIME;
```

Web Lab 4

1. Data recorded while driving on highway
   https://www.google.com/fusiontables/DataSource?snapid=S780001WJ7b
2. Data recorded while driving on local
   https://www.google.com/fusiontables/DataSource?snapid=S780002Wpgp
3. Data recorded while riding a bike
   https://www.google.com/fusiontables/DataSource?snapid=S7800044u26

Project 4

Group 1 Project Review

Project Summary:

An adaptive maps will be created along with adaptive user interfaces and presenting the most relevant information to the user. Google Maps API and Google Calendar API will be used in order to get user's location and daily schedule. Color and shading will indicate user's next destinations.

Novel Information:

Google OAuth2 Documentation: Access a user's private Google data.
Geocoding with the Google Maps API: Geocode the events into location coordinates.
Google Directions API: Get routing information.
Google Styled Maps Documentation: Create styled maps.

Suggestion:

Since the calendar's location filed is not spatially aware in any way, maybe it's a good idea to ignore the exact coordinates. Try to use a place name like street name and house number instead, because string value is accepted in Google Calendar and it's also more user friendly than make user to enter the exact coordinates.

Group 9 Project Review

This project is looking at the use of crowdsourcing pedestrians to generate trajectories that can be used to better understand the behavior. The team is looking at the creation of pedestrian probe trajectories. The trajectories have been used to understand vehicular traffic. There are two main categories of approaches when modeling the behavior of travelers. One is the microscopic modeling and the other is focusing on the large scale. In order to use gather data easily, prevalence of smartphones will be utilizing. And, the easiest way to tract the trajectory of a pedestrian is to use Global Positioning System (GPS). But within the GPS data, there will be some additional related data. These additional related data would be a problem and they should be consideration.