

Experiment No. 9 - Spatial and Temporal Data Handling

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Date	

ADBMS Experiment 9

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Subject : ADBMS

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Aim : Processing of spatial & temporal data

Theory :

Temporal Database

Database that store information which is time dependent in one or the other way, are called as temporal db databases

Temporal DB store information about states of real world across time.

It is a database with built-in support for handling data involving time

It stores information relating to past, present & future time

Examples :

(1) Health Care Systems

History of patients health is required

Here, past records & current condition both have equal significance.

(2) Insurance Systems

We need to keep a track of claims, accident history &

many more

Also, the time when policies are in effect

Spatial Database

A spatial database is a db that deals with information associated with geographical locations such as cities, towns, etc

It is optimized to store & query data representing objects

These are the objects which are defined in geometric space

It offers spatial data types in its data model & query language.

It supports spatial datatype in its implementation providing atleast spatial indexing & efficient algorithm for spatial join

They are majorly of 3 types

(1) Vector data

(2) Raster data

(3) Image data

Conclusion : Thus, we studied & implemented spatial & temporal data

Code:

```
const data = {"type": "FeatureCollection", "features": [{"type": "Feature", "geometry": {"type": "Point", "coordinates": [[122.0, 10.0], [113.0, 2.0], [14.0, 0.0], [235.0, 1.0]]}]}
```

```

"properties" : {"Name" : "Redwood City", "time" : 14.0}},
{"type" : "Feature",
"geometry" : {"type" : "LineString",
"coordinates" : [[102.0, 0.0],
[103.0, 1.0],
[104.0, 0.0],
[105.0, 1.0]]},
"properties" : {"Name" : "USA", "time" : 24.0}},
{"type" : "Feature",
"geometry" : {"type" : "Polygon",
"coordinates" : [[[100.0, 0.0],
[101.0, 0.0],
[101.0, 1.0],
[100.0, 1.0],
[100.0, 0.0]]]},
"properties" : {"Name" : "Ghatkopar", "prop1" : {"this" :

```

```

"that"}}}} const features = data["features"] features.map(feature =>
{
const coordindates = feature.geometry.coordinates; if(coordindates[0][0] > 100 &&
coordindates[0][1] < 102 && feature.properties.time > 20){
console.log(feature.properties)
}
})

```

Screenshots :

START_DATE	START_TIME	DISTANCE	MODE	CONFIDENCE	PLACES
2022-06-03	04:26:00	1665	IN_PASSENGER_VEHICLE	LOW	Oberoi Mall
2022-06-03	03:02:00	1149	IN_PASSENGER_VEHICLE	LOW	Malad
2022-06-06	03:12:00	1041	IN_PASSENGER_VEHICLE	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	03:31:00	9680	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	07:19:00	1146	IN_PASSENGER_VEHICLE	LOW	Malad Station
2022-06-06	07:29:00	1338	IN_PASSENGER_VEHICLE	LOW	Vile Parle
2022-06-06	07:49:00	9571	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	02:38:00	911	MOTORCYCLING	LOW	Vile Parle Station
2022-06-07	02:49:00	1034	MOTORCYCLING	LOW	McDonald's
2022-06-07	03:03:00	9641	IN_TRAIN	LOW	Union Bank Of India
2022-06-07	07:21:00	1305	MOTORCYCLING	LOW	Rekha Steel Centre
2022-06-07	07:35:00	1231	IN_PASSENGER_VEHICLE	LOW	Bikaji Retail Store Malad East
2022-06-07	07:53:00	9442	IN_TRAIN	LOW	Surbhi Sweets and Snacks
2022-06-07	02:18:00	928	MOTORCYCLING	LOW	Union Bank Of India
2022-06-08	02:43:00	9966	IN_TRAIN	LOW	Bikaji Retail Store Malad East
2022-06-08	06:30:00	1141	MOTORCYCLING	LOW	M R Boutique
2022-06-08	06:54:00	1159	WALKING	HIGH	Ashoka General Hospital
2022-06-08	07:11:00	9111	IN_TRAIN	MEDIUM	Union Bank Of India
2022-06-08	11:56:00	874	MOTORCYCLING	LOW	Monica Mall
2022-06-09	11:56:00	230	MOTORCYCLING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-09	12:17:00	140	MOTORCYCLING	LOW	Bikaji Retail Store Malad East
2022-06-09	12:48:00	483	MOTORCYCLING	LOW	Manjeewan School
2022-06-09	13:06:00	250	MOTORCYCLING	MEDIUM	Rekha Steel Centre
2022-06-09	08:50:00	544	MOTORCYCLING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-10	09:30:00	359	MOTORCYCLING	LOW	Ashoka General Hospital
2022-06-10	09:42:00	530	IN_PASSENGER_VEHICLE	LOW	Malad
2022-06-10	10:18:00	450	WALKING	LOW	Surbhi Sweets and Snacks
2022-06-10	11:20:00	501	WALKING	LOW	Vile Parle
2022-06-11	11:38:00	322	WALKING	MEDIUM	McDonald's
2022-06-11	11:50:00	176	WALKING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-11	11:50:00	4413	MOTORCYCLING	LOW	Surbhi Sweets and Snacks
2022-06-14	12:38:00	806	MOTORCYCLING	MEDIUM	McDonald's
2022-06-14	12:51:00	557	MOTORCYCLING	MEDIUM	Union Bank Of India
2022-06-14	04:03:00	287	MOTORCYCLING	LOW	Vile Parle
2022-06-15	04:16:00	1030	CYCLING	LOW	Monica Mall
2022-06-15	04:39:00	9661	IN_TRAIN	HIGH	Bandra Station
2022-06-15	08:10:00	1133	MOTORCYCLING	LOW	Malad Station
2022-06-15	08:27:00	838	IN_PASSENGER_VEHICLE	LOW	Oberoi Mall
2022-06-15	08:38:00	122	WALKING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-15	09:00:00	5003	IN_TRAIN	LOW	Malad Station
2022-06-15	10:11:00	660	IN_PASSENGER_VEHICLE	LOW	Vile Parle Station
2022-06-15	10:22:00	770	WALKING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-15	05:25:00	15342	IN_TRAIN	LOW	Ashoka General Hospital

MySQL 8.0 Command Line Client

```
mysql> select *from 2022_JUNE WHERE START_TIME < "10:00:00";
```

START_DATE	START_TIME	DISTANCE	MODE	CONFIDENCE	PLACES
2022-06-03	04:26:00	1665	IN_PASSENGER_VEHICLE	LOW	Oberoil Mall
2022-06-03	03:02:00	1149	IN_PASSENGER_VEHICLE	LOW	Malad
2022-06-06	03:12:00	1041	IN_PASSENGER_VEHICLE	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	03:31:00	9680	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	07:19:00	1146	IN_PASSENGER_VEHICLE	LOW	Malad Station
2022-06-06	07:29:00	1338	IN_PASSENGER_VEHICLE	LOW	Vile Parle
2022-06-06	07:49:00	9571	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	02:38:00	911	MOTORCYCLING	LOW	Vile Parle Station
2022-06-07	02:49:00	1034	MOTORCYCLING	LOW	McDonald's
2022-06-07	03:03:00	9641	IN_TRAIN	LOW	Union Bank Of India
2022-06-07	07:21:00	1305	MOTORCYCLING	LOW	Rekha Steel Centre
2022-06-07	07:35:00	1231	IN_PASSENGER_VEHICLE	LOW	Bikaji Retail Store Malad East
2022-06-07	07:53:00	9442	IN_TRAIN	LOW	Surbhi Sweets and Snacks
2022-06-07	02:18:00	928	MOTORCYCLING	LOW	Union Bank Of India
2022-06-08	02:43:00	9966	IN_TRAIN	LOW	Bikaji Retail Store Malad East
2022-06-08	06:30:00	1141	MOTORCYCLING	LOW	M R Boutique
2022-06-08	06:54:00	1159	WALKING	HIGH	Ashoka General Hospital
2022-06-08	07:11:00	9111	IN_TRAIN	MEDIUM	Union Bank Of India
2022-06-09	08:50:00	544	MOTORCYCLING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-10	09:30:00	359	MOTORCYCLING	LOW	Ashoka General Hospital
2022-06-10	09:42:00	530	IN_PASSENGER_VEHICLE	LOW	Malad
2022-06-14	04:03:00	287	MOTORCYCLING	LOW	Vile Parle
2022-06-15	04:16:00	1030	CYCLING	LOW	Monica Hall
2022-06-15	04:39:00	9661	IN_TRAIN	HIGH	Bandra Station
2022-06-15	08:10:00	1133	MOTORCYCLING	LOW	Malad Station
2022-06-15	08:27:00	838	IN_PASSENGER_VEHICLE	LOW	Oberoil Mall
2022-06-15	08:38:00	122	WALKING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-15	09:00:00	5003	IN_TRAIN	LOW	Malad Station
2022-06-15	05:25:00	15342	IN_TRAIN	LOW	Ashoka General Hospital

29 rows in set (0.00 sec)

```
mysql> select *from 2022_JUNE WHERE CONFIDENCE="MEDIUM";
```

START_DATE	START_TIME	DISTANCE	MODE	CONFIDENCE	PLACES
2022-06-06	03:31:00	9680	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	07:49:00	9571	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-08	07:11:00	9111	IN_TRAIN	MEDIUM	Union Bank Of India
2022-06-09	13:06:00	250	MOTORCYCLING	MEDIUM	Rekha Steel Centre
2022-06-09	08:50:00	544	MOTORCYCLING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-11	11:38:00	322	WALKING	MEDIUM	McDonald's
2022-06-11	11:50:00	176	WALKING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-14	12:38:00	806	MOTORCYCLING	MEDIUM	McDonald's
2022-06-14	12:51:00	557	MOTORCYCLING	MEDIUM	Union Bank Of India

9 rows in set (0.00 sec)

```
mysql> select *from 2022_JUNE WHERE PLACES = "SVKM's Dwarkadas J. Sanghvi College of Engineering";
```

START_DATE	START_TIME	DISTANCE	MODE	CONFIDENCE	PLACES
2022-06-06	03:12:00	1041	IN_PASSENGER_VEHICLE	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	03:31:00	9680	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	07:49:00	9571	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-09	11:56:00	230	MOTORCYCLING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-09	08:50:00	544	MOTORCYCLING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-11	11:50:00	176	WALKING	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-15	08:38:00	122	WALKING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-15	10:22:00	770	WALKING	LOW	SVKM's Dwarkadas J. Sanghvi College of Engineering

8 rows in set (0.00 sec)


```
mysql> select *from 2022_JUNE WHERE DISTANCE > 2000;
```

START_DATE	START_TIME	DISTANCE	MODE	CONFIDENCE	PLACES
2022-06-06	03:31:00	9680	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-06	07:49:00	9571	IN_TRAIN	MEDIUM	SVKM's Dwarkadas J. Sanghvi College of Engineering
2022-06-07	03:03:00	9641	IN_TRAIN	LOW	Union Bank Of India
2022-06-07	07:53:00	9442	IN_TRAIN	LOW	Surbhi Sweets and Snacks
2022-06-08	02:43:00	9966	IN_TRAIN	LOW	Bikaji Retail Store Malad East
2022-06-08	07:11:00	9111	IN_TRAIN	MEDIUM	Union Bank Of India
2022-06-11	11:50:00	4413	MOTORCYCLING	LOW	Surbhi Sweets and Snacks
2022-06-15	04:39:00	9661	IN_TRAIN	HIGH	Bandra Station
2022-06-15	09:00:00	5003	IN_TRAIN	LOW	Malad Station
2022-06-15	05:25:00	15342	IN_TRAIN	LOW	Ashoka General Hospital

```
10 rows in set (0.00 sec)
```

```
mysql>
```