

## Ass2

### Q1

```
SELECT line_id,
       Chinese_name
FROM (SELECT DISTINCT ld.line_id,
                     s.chinese_name AS Chinese_name,
                     ld.station_id
      FROM line_detail ld
      JOIN stations s ON ld.station_id = s.station_id::integer
      JOIN bus_lines bl ON ld.station_id = bl.station_id
      WHERE bl.bus_line = '2') AS subquery
ORDER BY line_id ASC,
       station_id ASC;
```

	line_id	chinese_name
1	1	罗湖
2	1	国贸
3	2	湖贝
4	3	翠竹
5	3	田贝
6	5	太安
7	7	田贝
8	7	太安

### Q2

```
with max_count as (select count(*) as max_count
                    from line_detail
                    group by line_id
                    order by count(*) DESC
                    limit 1)
select distinct on (ld.line_id) ld.line_id,
                          st.chinese_name as chinese_name
from line_detail ld
  join stations st on ld.station_id = st.station_id
where ld.line_id in (select line_id
                    from line_detail
                    group by line_id
                    having count(*) = (select max_count from max_count))
order by ld.line_id, ld.num;
```

	line_id	chinese_name
1	9	航海路

### Q3

```
select station_id,
       chinese_name
from stations
where station_id in (select station_id
                    from line_detail
                    where line_id = 1)
and station_id in (select station_id
                  from line_detail
                  where line_id = 5)
and station_id not in (select station_id
                      from line_detail
                      where line_id = 2)
order by station_id;
```

	station_id	chinese_name
1	22	前海湾
2	24	宝安中心

### Q4

```
select distinct on (ld1.line_id , ld2.line_id , station_id) s.station_id,
                  s.chinese_name,
                  ld1.line_id as line_id,
                  ld2.line_id as line_id
from line_detail ld1
      inner join line_detail ld2 on ld1.station_id = ld2.station_id
      left join stations s on ld1.station_id = s.station_id
where ld1.line_id > ld2.line_id
order by ld1.line_id DESC, ld2.line_id DESC, station_id;
```

	station_id	chinese_name	line_id	line_id
1	11	车公庙	11	9
2	45	红树湾南	11	9
3	11	车公庙	11	7
4	22	前海湾	11	5
5	46	福田	11	3
6	4	大剧院	11	2
7	44	后海	11	2
8	46	福田	11	2
9	47	岗厦北	11	2
10	4	大剧院	11	1
11	11	车公庙	11	1
12	22	前海湾	11	1
13	11	车公庙	9	7
14	158	红岭北	9	7
15	103	上梅林	9	4
16	79	红岭	9	3
17	65	景田	9	2
18	11	车公庙	9	1
19	127	西丽	7	5
20	140	太安	7	5
21	101	福民	7	4
22	74	石厦	7	3
23	77	华新	7	3
24	82	田贝	7	3
25	61	安托山	7	2
26	68	华强北	7	2
27	11	车公庙	7	1
28	106	深圳北站	5	4
29	85	布吉	5	3
30	71	黄贝岭	5	2

31	22	前海湾	5	1
32	24	宝安中心	5	1
33	75	少年宫	4	3
34	67	市民中心	4	2
35	8	会展中心	4	1
36	46	福田	3	2
37	3	老街	3	1
38	9	购物公园	3	1
39	4	大剧院	2	1
40	15	世界之窗	2	1

## Q5

```

WITH ranked_stations AS (SELECT Id.line_id,
                                Id.station_id,
                                Id.num,
                                s.chinese_name,
                                l.line_color,
                                cn.hex,
                                FIRST_VALUE(s.chinese_name)
                                over(PARTITION BY Id.line_id ORDER BY Id.num)      as
start_name,

                                FIRST_VALUE(s.chinese_name)
                                over (PARTITION BY Id.line_id ORDER BY Id.num DESC) as
terminal_name

                                from line_detail Id
                                left join stations s ON Id.station_id = s.station_id
                                left join lines l ON Id.line_id = l.line_id
                                left join color_names cn ON cn.name = l.line_color)

select distinct start_name      as start,
                terminal_name as terminal,
                line_id,
                line_color,
                hex
from ranked_stations
order by line_id;

```

	start	terminal	line_id	line_color	hex
1	罗湖	机场东	1	Green	#008000
2	赤湾	新秀	2	Orange	#FFA500
3	益田	双龙	3	DeepSkyBlue	#00BFFF
4	福田口岸	牛湖	4	Red	#FF0000
5	前海湾	黄贝岭	5	DarkOrchid	#9932CC
6	西丽湖	文体公园	7	MediumBlue	#0000CD
7	航海路	文锦	9	DimGray	#696969
8	碧头	大剧院	11	Purple	#800080

**Q6**

```

with warmcolor_lines as (select distinct ld.line_id,
                                l.line_color,
                                cn.hex
                        from line_detail ld
                        left join lines l on (ld.line_id = l.line_id)
                        left join color_names cn on (cn.name = l.line_color)
                        WHERE SUBSTRING(cn.hex FROM 6 FOR 2) < '80')

select wl.line_id
from warmcolor_lines wl
    left join line_detail ld on (wl.line_id = ld.line_id)
    left join stations s on (ld.station_id = s.station_id)
where s.latitude is NOT NULL
group by wl.line_id
order by (MAX(s.latitude) - MIN(s.latitude)) DESC
LIMIT 1;

```

	line_id	
1		4

**Q7**

```

with first_words as (select split_part(english_name, ' ', 1) as first_word,
                                count(*) as count
                    from stations
                    where english_name is not NULL
                    group by first_word)

select first_word as prefix, count
from first_words
order by count DESC
limit 1;

```

	prefix	count
1	Shenzhen	4

**Q8**

```

select distinct station_id
from connections
where connection like '%MTR%'
or connection like '%Railway%'

```

	station_id
1	46
2	1
3	85
4	106
5	100
6	20

**Q9**

```

select distinct s.station_id,
               s.chinese_name,
               ld1.line_id as ld1id,
               ld2.line_id as ld2id
from line_detail ld1
     inner join line_detail ld2 on (ld1.station_id = ld2.station_id)
     left join stations s on (ld1.station_id = s.station_id)
where ld1.line_id < ld2.line_id
     and (ld1.line_id = 1 or ld1.line_id = 5 or ld1.line_id = 11)
     and (ld2.line_id = 1 or ld2.line_id = 5 or ld2.line_id = 11)
order by station_id;

```

	station_id	chinese_name	ld1id	ld2id
1	4	大剧院	1	11
2	11	车公庙	1	11
3	22	前海湾	1	5
4	22	前海湾	1	11
5	22	前海湾	5	11
6	24	宝安中心	1	5

**Q10**

```
select opening                as year,  
       'line ' || line_id || ' opened' as event  
from lines  
where opening is NOT NULL  
       and opening between 2008 and 2021  
  
union all  
  
select latest_extension       as year,  
       'line ' || line_id || ' extended' as event  
from lines  
where latest_extension is NOT NULL  
       and latest_extension between 2008 and 2021  
  
order by year
```

	year	event
1	2010	line 3 opened
2	2010	line 2 opened
3	2011	line 4 extended
4	2011	line 5 opened
5	2011	line 1 extended
6	2011	line 2 extended
7	2011	line 3 extended
8	2016	line 7 opened
9	2016	line 9 opened
10	2016	line 11 opened
11	2018	line 20 opened
12	2019	line 6 opened
13	2019	line 10 opened
14	2020	line 8 opened