

1. כמה אלבומים הוקלטו בין תאריך Y1 לתאריך Y2

```
select Albu_Name from Album where Album_Rec_Start > Y1 and Album_Rec_End < Y2;
```

π Albu_Name σ Album (Album_Rec_Start > Y1 and Album_Rec_End < Y2)

2. כמה שירים שונים הקליט מוסיקאי X בין תאריך Y1 לתאריך Y2

```
select count(Track_Musicians.Track_ID) from Track_Musicians
join Track on Track.Track_ID = Track_Musicians.Track_ID
join Musician on Track_Musicians.Musician_ID = Musician.Musician_ID
where Track.Track_Date between Y1 and Y2 and Musician.Musician_Name = X
group by Track_Musicians.Track_ID;
```

π count(Track_Musicians.Track_ID) σ ((Track_Musicians) \bowtie Track.Track_ID = Track_Musicians.Track_ID (Track) \bowtie Track_Musicians.Musician_ID = Musician.Musician_ID (Musician)) ? Album_Rec_Start > Y1 and Album_Rec_End < Y2)

3. בכמה אלבומים שונים השתתף מוסיקאי X בין תאריך Y1 לתאריך Y2

```
select count(Album_Tracks.Albu_ID) from Track_Musicians
join Track on Track.Track_ID = Track_Musicians.Track_ID
join Musician on Track_Musicians.Musician_ID = Musician.Musician_ID
join Album_Tracks on Album_Tracks.Track_ID = Track.Track_ID
where Track.Track_Date between Y1 and Y2 and Musician.Musician_Name = X
group by Album_Tracks.Track_ID;
```

π count(Album_Tracks.Albu_ID) σ ((Track_Musicians) \bowtie Track.Track_ID = Track_Musicians.Track_ID (Track) \bowtie Track_Musicians.Musician_ID = Musician.Musician_ID (Musician) \bowtie Album_Tracks.Track_ID = Track.Track_ID (Album_Tracks)) ? Track.Track_Date \cup Y1 and Y2 and Musician.Musician_Name = X

4. כלי הנגינה הפופולרי ביותר

```
select Instrument.Instrument_type from Musician_Instruments left join Instrument on
Musician_Instruments.Instrument_ID = Instrument.Instrument_ID left join
Track_Musicians on Musician_Instruments.Musician_ID = Track_Musicians.Musician_ID
group by Instrument.Instrument_type order by count(Instrument.Instrument_type) desc
limit 1;
```

π Instrument.Instrument_type σ ((Musician_Instruments) \bowtie
 Musician_Instruments.Instrument_ID = Instrument.Instrument_ID (Instrument) \bowtie
 Musician_Instruments.Musician_ID = Track_Musicians.Musician_ID (Track_Musicians)
 order by count(Instrument.Instrument_type) desc limit 1

5. רשימת כלי הנגינה באלבום A

select distinct Instrument_type
 from Album_Tracks
 left join Track_Musicians on Album_Tracks.Track_ID = Track_Musicians.Track_ID
 left join Musician_Instruments on Track_Musicians.Musician_ID =
 Musician_Instruments.Musician_ID
 left join Instrument on Musician_Instruments.Instrument_ID = Instrument.Instrument_ID
 left join Album on Album_Tracks.Album_ID = Album.Album_ID
 where Album_Name = A;

π distinct Instrument_type σ ((Album_Tracks) \bowtie Album_Tracks.Track_ID =
 Track_Musicians.Track_ID (Track_Musicians) \bowtie Musician_Instruments on
 Track_Musicians.Musician_ID = Musician_Instruments.Musician_ID
 (Musician_Instruments) \bowtie Musician_Instruments.Instrument_ID =
 Instrument.Instrument_ID (Instrument) \bowtie Album_Tracks.Album_ID = Album.Album_ID
 (Album) ? Album_Name = A

6. המפיק הפורה ביותר בין תאריך Y1 לתאריך Y2

select Producer_Name
 from
 (
 Select Album_Producers.Producer_ID, Producer_Name
 from Album_Producers
 left join Album on Album_Producers.Album_ID = Album.Album_ID
 left join Producer on Album_Producers.Producer_ID = Producer.Producer_ID
 where Album_Rec_Start > Y1 and Album_Rec_End < Y2
) as b
 group by Producer_ID order by count(Producer_ID) limit 1;

π distinct Producer_Name σ
 (π Album_Producers.Producer_ID, Producer_Name σ (Album) \bowtie
 Album_Producers.Album_ID = Album.Album_ID (Album) \bowtie
 Album_Producers.Producer_ID = Producer.Producer_ID (Producer)
) ? Album_Rec_Start > Y1 and Album_Rec_End < Y2 order by count(Producer_ID) limit
 1

7. היצורן הפופולרי ביותר

```
select Instrument.Instrument_Manufacturer from Musician_Instruments left join
Instrument on Musician_Instruments.Instrument_ID = Instrument.Instrument_ID left join
Track_Musicians on Musician_Instruments.Musician_ID = Track_Musicians.Musician_ID
group by Instrument.Instrument_Manufacturer order by
count(Instrument.Instrument_Manufacturer) desc limit 1;
```

```
 $\pi$  distinct Instrument.Instrument_Manufacturer  $\sigma$  ((Musician_Instruments)  $\bowtie$ 
Musician_Instruments.Instrument_ID = Instrument.Instrument_ID (Instrument)  $\bowtie$ 
Musician_Instruments.Musician_ID = Track_Musicians.Musician_ID (Track_Musicians) )
order by count(Instrument.Instrument_Manufacturer) desc limit 1
```

8. כמה מוסיקאים הקליטו לאורך כל השנים

```
select count(distinct (Track_Musicians.Musician_ID)) from Track_Musicians right join
Track on Track_Musicians.Track_ID = Track.Track_ID;
```

```
 $\pi$  count(distinct (Track_Musicians.Musician_ID))  $\sigma$  ((Track_Musicians)  $\bowtie$ 
Track_Musicians.Track_ID = Track.Track_ID (Track))
```

9. המוסיקאי ששיתף פעולה עם המספר הגדול ביותר של מוסיקאים אחרים

```
select * from (select Track_ID from Track_Musicians group by Track_ID order by
count(Track_ID) desc limit 1 ) as b left join Track_Musicians on
Track_Musicians.Track_ID = b.Track_ID left join Musician on
Track_Musicians.Musician_ID = Musician.Musician_ID limit 1;
```

```
 $\sigma$  ((Musician_Instruments) ( $\pi$  Track_ID  $\sigma$  (Track_Musicians) order by count(Track_ID)
desc limit 1 ) as b  $\bowtie$  Track_Musicians.Track_ID = b.Track_ID (Track_Musicians)  $\bowtie$ 
Track_Musicians.Musician_ID = Musician.Musician_ID (Musician) limit 1
```

10. ז'אנר השירים הפופולרי ביותר

```
select Genre_Name
from
(select * from Track left join Genre on Track.Genre = Genre.Genre_ID)
as b
group by Genre_ID order by count(Genre_ID) desc limit 1;
```

```
 $\pi$  Genre_Name  $\sigma$  ( $\sigma$  (Track)  $\bowtie$  Track.Genre = Genre.Genre_ID (Genre)) as b order by
count(Genre_ID) desc limit 1
```

11. מיהו טכנאי ההקלטה שהקליט המספר הגדול ביותר של שירים בין תאריך Y1 לתאריך Y2

```
select Technition.Techntion_Name from Technition join Track on
Technition.Techntion_ID = Track.Techntion_ID
where Track_Date between Y1 and Y2
group by Technition.Techntion_ID order by count(Technition.Techntion_ID) desc limit 1;
```

π Technition.Techntion_Name σ ((Technition) \bowtie Technition.Techntion_ID = Track.Techntion_ID (Track) ? Track_Date between Y1 and Y2 order by count(Technition.Techntion_ID) desc limit 1

12. מהו האלבום הראשון שהוקלט באולפן

```
select Albun_Name from Album order by Album_Rec_End asc limit 1;
```

π Albun_Name σ (Album) asc limit 1

13. רשימת כל השירים הנכללים ב- 2 אלבומים או יותר

```
select Track.Track_Name, count(Album_tracks.Track_ID) as 'Track_ID_count' from
Album_Tracks join Track on Track.Track_ID = Album_Tracks.Track_ID where
'Track_ID_count' >= '2' group by Album_Tracks.Track_ID;
```

π Track.Track_Name, count(Album_tracks.Track_ID) σ (Album_Tracks) \bowtie Track.Track_ID = Album_Tracks.Track_ID (Track) ? 'Track_ID_count' >= '2'

14. רשימת הטכנאים שהשתתפו בהקלטה של אלבום שלם

```
Select Technition_Name from (Select distinct count(Albun_ID), Technition_ID,
Number_Of_tracks, Technition_Name from (select distinct Track.Track_ID,
Track.Techntion_ID, Album_Tracks.Albun_ID, Number_Of_tracks, Technition_Name
from Track left join Album_Tracks on Track.Track_ID = Album_Tracks.Track_ID left join
Album on Album_Tracks.Albun_ID = Album.Albun_ID left join Technition on
Track.Techntion_ID = Technition.Techntion_ID) as b group by Albun_ID, Technition_ID
Having count(Albun_ID) = Number_Of_tracks limit 1) as c;
```

π Technition_Name σ (π distinct count(Albun_ID), Technition_ID, Number_Of_tracks, Technition_Name σ (π distinct Track.Track_ID, Track.Techntion_ID, Album_Tracks.Albun_ID, Number_Of_tracks, Technition_Name σ (Track) \bowtie Track.Track_ID = Album_Tracks.Track_ID (Album_Tracks) \bowtie Album_Tracks.Albun_ID = Album.Albun_ID (Album) \bowtie Track.Techntion_ID = Technition.Techntion_ID (Technition))

as b
group by Album_ID, Technician_ID
Having count(Album_ID) = Number_Of_tracks
limit 1) as c

15. מי הוא המוסיקאי שהקליט שירים במגוון הרחב ביותר של ז'אנרים

```
select Musician_Name  
from  
(select distinct Genre_ID, Track_Musicians.Musician_ID, Musician.Musician_Name  
from Track  
left join Genre on Track.Genre = Genre.Genre_ID  
left join Track_Musicians on Track.Track_ID = Track_Musicians.Track_ID  
left join Musician on Track_Musicians.Musician_ID = Musician.Musician_ID)  
as b  
group by Musician_ID order by Musician_ID desc limit 1;
```

```
 $\pi$  Musician_Name  $\sigma$  ( $\pi$  distinct Genre_ID, Track_Musicians.Musician_ID,  
Musician.Musician_Name  $\sigma$  (Track)  $\bowtie$  Track.Genre = Genre.Genre_ID (Genre)  $\bowtie$   
Track.Track_ID = Track_Musicians.Track_ID (Track_Musicians)  $\bowtie$   
Track_Musicians.Musician_ID = Musician.Musician_ID (Musician) as b) order by  
Musician_ID desc limit 1
```