Database Assignment answers

Q1)

```
select con.content_id,con.title,cat.category_name
from content as con
join category as cat
on con.category_id=cat.category_id;
```

```
mysql>  select con.content_id,con.title,cat.category_name
    ->  from content as con
    ->  join category as cat
    ->  on con.category_id=cat.category_id;
+------------+----------------------+---------------+
| content_id | title                | category_name |
+------------+----------------------+---------------+
|          2 | The Cosmic Heist     | Movies        |
|          6 | The Algorithm        | Movies        |
|          1 | Stranger Adventures  | Series        |
|          4 | Code Warriors        | Series        |
|          3 | Planet Earth: Oceans | Documentaries |
|          7 | Wildlife Mysteries   | Documentaries |
|          5 | Attack on Mars       | Anime         |
|          8 | Cyberpunk Chronicles | Anime         |
+------------+----------------------+---------------+
8 rows in set (0.06 sec)
```

Q2)select * from content order by rating desc;

```
mysql> select * from content order by rating desc;
+------------+----------------------+--------+------------------+--------------+-------------+
| content_id | title                | rating | views_in_millions | release_year | category_id |
+------------+----------------------+--------+------------------+--------------+-------------+
|          3 | Planet Earth: Oceans |    9.2 |           201.75 |         2023 |           3 |
|          5 | Attack on Mars       |    9.0 |           156.80 |         2023 |           4 |
|          7 | Wildlife Mysteries   |    8.8 |           178.90 |         2024 |           3 |
|          1 | Stranger Adventures  |    8.7 |           142.50 |         2023 |           2 |
|          8 | Cyberpunk Chronicles |    8.4 |           123.45 |         2023 |           4 |
|          4 | Code Warriors        |    8.1 |            67.20 |         2024 |           2 |
|          2 | The Cosmic Heist     |    7.9 |            89.30 |         2024 |           1 |
|          6 | The Algorithm        |    7.5 |            45.60 |         2024 |           1 |
+------------+----------------------+--------+------------------+--------------+-------------+
8 rows in set (0.02 sec)
```

Q3)

```
select cat.category_name,avg(rating)
from content as con
join category as cat
on con.category_id=cat.category_id
group by cat.category_name;
```

```
mysql> select cat.category_name,avg(rating)
    -> from content as con
    -> join category as cat
    -> on con.category_id=cat.category_id
    -> group by cat.category_name;
+---------------+-------------+
| category_name | avg(rating) |
+---------------+-------------+
| Movies        |     7.70000 |
| Series        |     8.40000 |
| Documentaries |     9.00000 |
| Anime         |     8.70000 |
+---------------+-------------+
4 rows in set (0.07 sec)
```

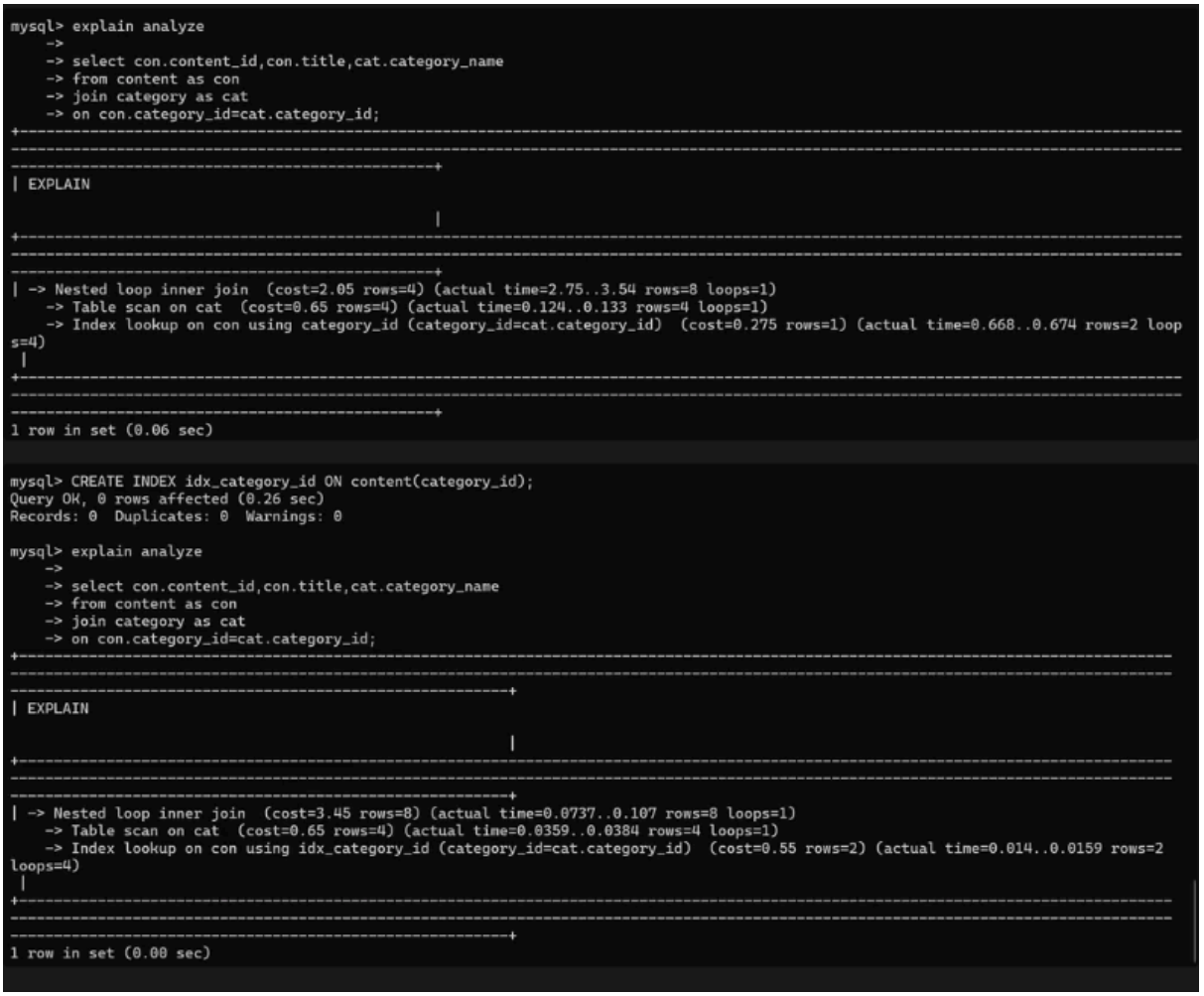
Q4)

```
select con.title,con.rating,con.views_in_millions,cat.category_name
from content as con
join category as cat
on con.category_id=cat.category_id
where (con.rating>8.5 and con.views_in_millions>100);
```

```
mysql>  select con.title,con.rating,con.views_in_millions,cat.category_na
    ->  from content as con
    ->  join category as cat
    ->  on con.category_id=cat.category_id
    ->  where (con.rating>8.5 and con.views_in_millions>100);
+---------------------+--------+-------------------+---------------+
| title               | rating | views_in_millions | category_name |
+---------------------+--------+-------------------+---------------+
| Stranger Adventures |    8.7 |            142.50 | Series        |
| Planet Earth: Oceans |    9.2 |            201.75 | Documentaries |
| Attack on Mars      |    9.0 |            156.80 | Anime         |
| Wildlife Mysteries  |    8.8 |            178.90 | Documentaries |
+---------------------+--------+-------------------+---------------+
4 rows in set (0.02 sec)

mysql>
```

Q5)



After creating the index the query became faster as we can see instead of scanning the entire table it now uses the index created to find the matching rows faster.

Why #1: Why do we use Foreign Keys?

We use foreign keys to make sure the referencing table cannot add invalid data.Say user_id in table B is a foreign key referencing the user_id (primary key) in table A.Adding a user_id in table B which is not present in table A would not make sense and lead to inconsistency.Therefore, we use foreign keys.

Why #2: Why is ACID important for this database?

If 1000 users watch “Stranger Adventures” at the same time and the system keeps updating the view count, if we do not use ACID properties the view count might become incorrect as some updates might be lost (lack of consistency and atomicity) or overwritten(lack of isolation).Apart from that the entire data might get lost if the database is not durable.Thus,we need to make sure that the database follows ACID properties so the final view count is accurate, consistent, and never corrupted, even under heavy traffic.

Why #3: Why would we create an index on category_id?

When StreamFlix homepage loads, it runs hundreds of queries filtering by category.This means that speed of fetching this data is important.. If the StreamFlix database was small then scanning the entire table would not take a lot of time but for huge databases this would be very slow.By creating an index on category_id, the database no longer needs to scan the whole table. It can directly find the matching records, which makes the site faster and more efficient.