Database Query Optimization

QA: The query is slow.

Engineers: Let's scale up the database.

Tech Lead & CTO: 😱

What can go wrong

```sql
SELECT *
FROM crm
WHERE register_date > '2020-01-01'
    AND is_priority=true
    AND (
      segment LIKE 'foo'
      OR segment LIKE 'bar'
    )
ORDER BY register_date
LIMIT 10;
```

What can go wrong - JOIN edition

```sql
SELECT *
FROM products as p
JOIN stock as s
    ON p.product_id=s.product_id
LIMIT 10;
```

Index types

B-Tree

- default index
- also works with partial string matching
- can also add sort order for `ORDER BY` clause

BRIN

- suited for date range filters

GIST

- suited for spatial data

GIN

- suited for full text search operations

What can be improved?

- Select only required columns
- Don't use `ORDER BY` when not necessary
- If it's exact matching, do not use `LIKE`, since this is partial matching, which is more taxing
- Always filter before performing `JOIN`
- Add indexes
  - Use appropriate index type per column data type / query pattern