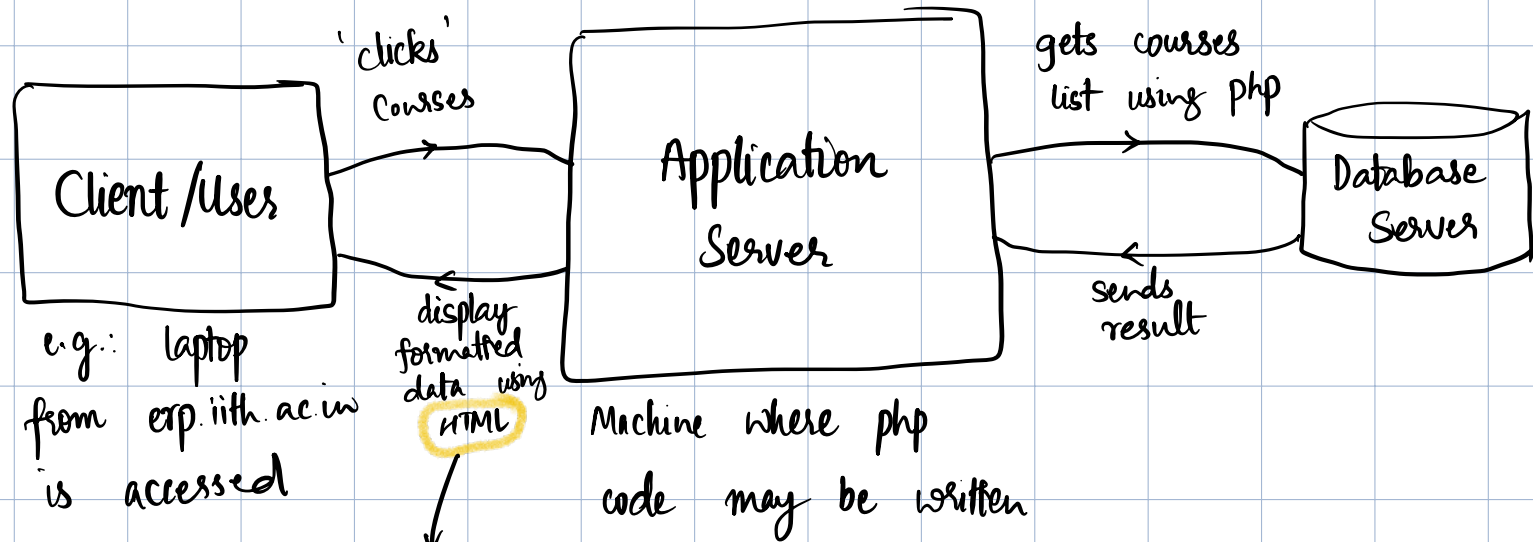


8 Jan 2025 - DBMS-II - Week 02

Database Architecture: Web-based application



different framework for desktop app

Why?

- security. (data can be accessed thru APIs)

e.g: customer entity :

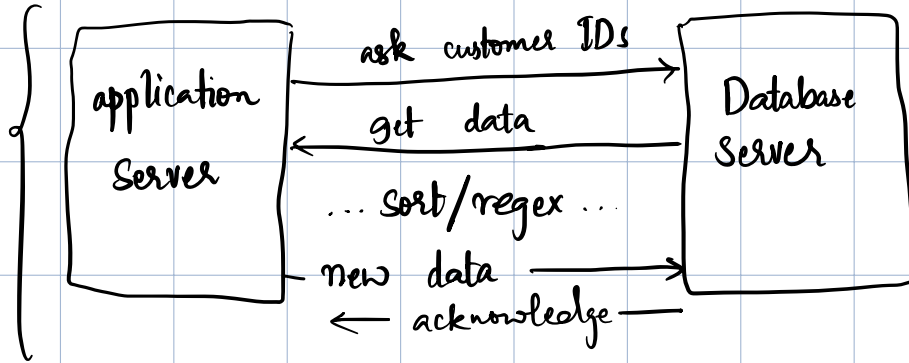
customer :

delivery address :

requirements: What should be the customer ID?

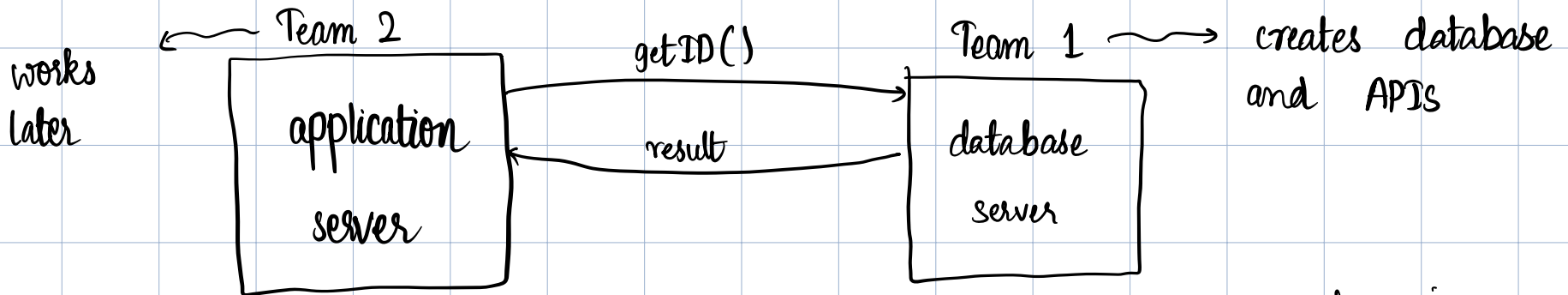
} other data is submitted by user through a form

time-consuming process if servers are at different locations



DBMS - I knowledge is not enough. We need:

* functions other than the existing functions like min, max, etc.



→ SQL injection (can be prevented by server-side form validation)
 can change in transit

→ syntax: know basic syntax → cannot be void

* stored procedure: may not return a single value

→ superset of functions

validate
getID ()
insert customer
insert address

→ query optimization (like compiler optimization)

$$\frac{A \bowtie B \bowtie C}{\quad ? \quad ?}$$

$x * 2$ as $x + x$
expensive

→ values can be returned

IN ~ call by value

OUT ~ return value

INOUT ~ call by reference

→ Advantages : performance, productivity, ease of use, scalability, maintainability, security

→ disadvantages : testing, debugging, versioning, cost

* Triggers : automatic execution by the DB when a specific event occurs in that table.

Doubts

* can we use mysql documentation in quizzes?

~~* What does MySQL lack for it to not be used by popular companies? What do popular companies use?~~

10 Jan 2025

Triggers :

* syntax

```
CREATE TRIGGER upd-check BEFORE UPDATE ON account
FOR EACH ROW
BEGIN
  IF NEW.amount < 0 THEN
    SET NEW.amount = 0;
  ELSEIF NEW.amount > 100 THEN
    SET NEW.amount = 100;
  END IF;
END; // delimiter;
```

trigger name

table name

OLD
NEW

may or may not be inserted

- combination of

* database event: INSERT, UPDATE, DELETE statements
are run on a table

* event time: BEFORE or AFTER the statement

* OLD vs. NEW

- not recommended to be used when not required

- separate functions for data replications

- validation → triggers not necessary

- UNIQUE and primary key

needed when one
server crashes
replication & recovery

* Advantages

* Disadvantages: - triggers can only provide extended validation

- may increase the overhead of the database (chain of triggers)
- can be difficult to troubleshoot

Common Table Expression (CTE)

eid	salary	dept
		CSE
		CSE
		EE
		⋮

- temporary table \equiv local variable

WITH \rightsquigarrow useful for complex requirements

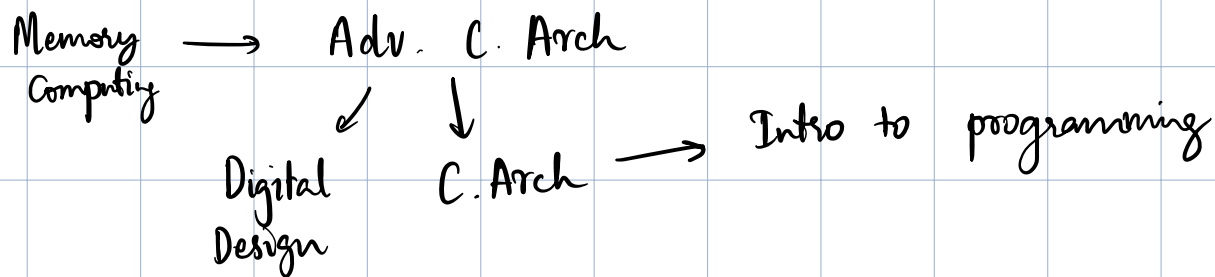
Display total salary of each department where each salary is greater than 60,000

- gfg, mysql

↓
having statement can be used here

- don't worry about performance ; query engine will optimize your queries

* Recursive CTEs: e.g.: prerequisites for a course



Find list of all prerequisites for Memory computing

```
WITH RECURSIVE cte(n) as
{
  select 1 } -- ~ base case
  union ALL
  SELECT n+1 FROM cte where n < 5
} select * FROM cte;
```

- Cursors