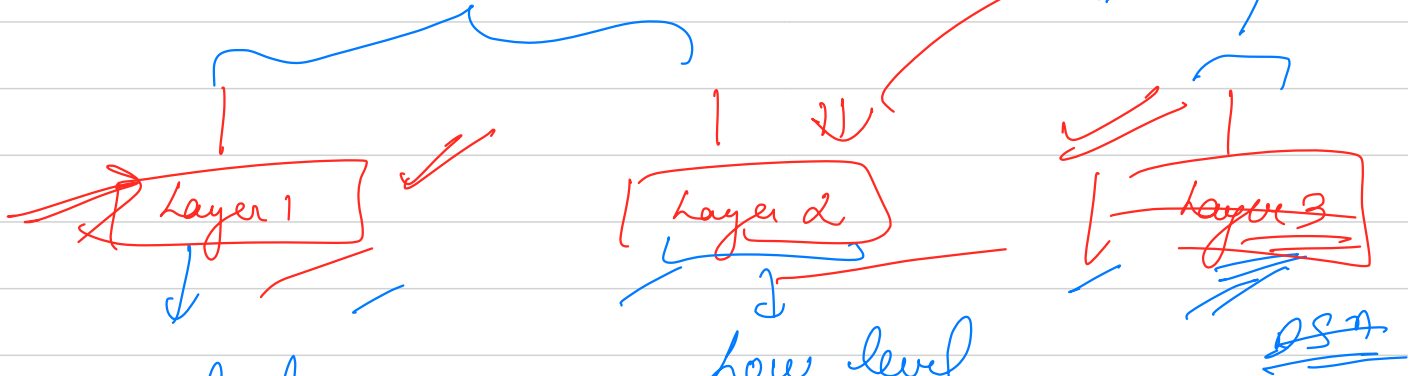



→ Development Task

URL Shorten

Coding part



HCD

High level
design architecture
of the project

Low level
design architecture
of the project

LCD

Class Structure

Design pattern

Machine
Code part

Designing a URL shortener

→ functional

→ URL → short url

→ short url → URL

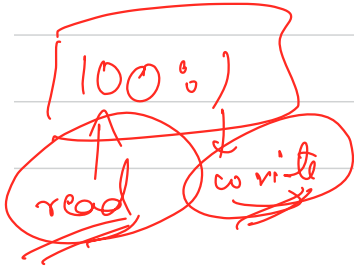
→ expiry time of short URL

Non functional requirement
highly available
minimum latency
shorts → original non guessable

Estimation

→ Traffic ✓

→ Storage ✓



Traffic \rightarrow (1 month) \rightarrow 100 M new URL

(QPS)

Query per second

$$\frac{100 \text{ million}}{30 \times 24 \times 3600}$$

$$= \frac{10^8}{28 \times 10^5}$$

$$\Rightarrow \frac{10^3}{28}$$

$$\Rightarrow \frac{10^3 \times 10^2}{28}$$

$$\Rightarrow \frac{10^5}{28} \text{ req/sec}$$

5 year

string

8 hrs ago

100 byte

$$100 M \times 5 \times 12 = 60 \times 100 M$$

$$1024 MB = 1 GB$$

6 B

$$6 B \times 100 \text{ bytes} = 600 B$$

$$1 GB = 10^9 \text{ bytes}$$

Caety

1 TB

DB design

Counter

2 2 ✓

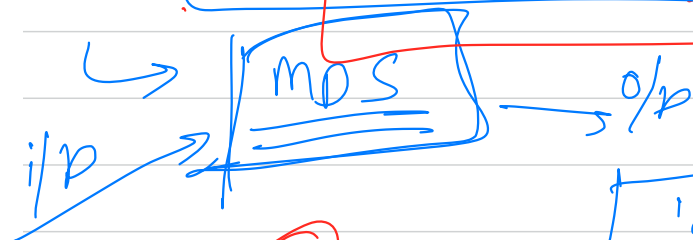
URL	shortcode	<u>PK</u> <u>ID</u>	created at	has expired

NO SQL ✓

#Algorithm

<https://www.unacademy.com/learn/cp>

??
😊



Chal

128 bit strip

shared url??

120

1 char

1 char



encode
Base 64

$$2^6 = 64$$

any 6 bits
can form 1 char
< 32 char

128 Bits

$$\frac{128}{6} = 21$$

21 char

128 bit

16

hexadecimal

16 base

1 byte = 8 bit
8 bit →

2⁸

binary 256

Hexa → 16 char

4 bit

1 hexadecimal

2⁴ = 16

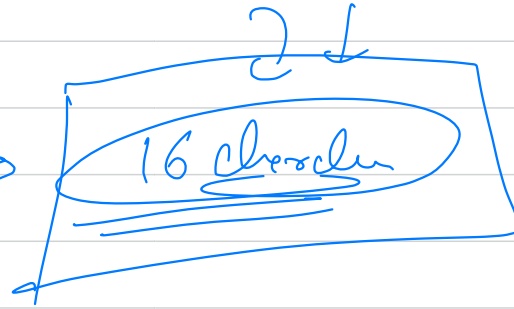
Base 16

1 byte → 2 char

16 x 2 = 32 by

Band 56 $\rightarrow 2^8$

$$\frac{128}{8} \Rightarrow \underline{16} \rightarrow$$



6 \rightarrow 8 character

take 6 character from the prefix & random shuffle

with rest of the 10 char

abc|def xyz|233

collis

create URL

POST

Req body

URL →

userid →

authid →

api-key →

...

Respon body

shorten-url

code

message →

copy detail →

delete URL

copy logic

CRON ??

JOB

