

Section 1:

Q.1: What do you think are the possible steps for offline syncing of a file?

Tell us **10 steps**, you think, that services like Dropbox, Google Drive etc. are doing. Tell us **5 things** that they could do, for improving the behaviour of Offline Sync.

Answer:

Step 1 – 10:

Step 1-5:

Q 2: Consider an entity called **"Country"**. Country consists of **"States"**. States are further divided into **"Privileged_States"** and **"General_States"**. Each state has its **"State_Law"** which you can think of as a Text. However for the **"Privileged_States"**, the **"State_Law"** text is preceded by **"Country_Law"**.

Can you create a database architecture for this? More points if you create an architecture for both Relational (MySQL, PostgreSQL etc.) and Non-Relational Database (MongoDB etc.), and compare it.

Section 2: Programming

Q 3: Now since you have created a database architecture, write a program in language of your choice to Sync the **State_Law of each State as a .txt file/.rtf file** on your machine.

Few possible things that you may need to do is:

- i) Write a bash script to initiate the process.
- ii) Install related libraries that connects your script with database server (of your choice).

More points if you can edit the .txt file further to update the changes on the database.

Q 4) Now consider **Privileged_State** has 40 laws (think of them as properties) of its own. It further inherits some x number of laws from Country (x is not a fixed variable).

So, for example: in JavaScript it may be like:

```
var priv_state = "UP";
```

```
priv_state.laws return an array of length 40
```

```
priv_state.getCountry.laws return an array of length x, which is not fixed
```

Now write a program in language of your choice with Time Complexity $< O(n^2)$ which appends all the state_laws and country_laws of each state into priv_state.laws arrays, so that after appending priv_state.laws return an array of length = $(40+x)$

No answers will be accepted for Time Complexity $\geq O(n^2)$
