

Concurrency (Let's Read a Story ...)

Let's presume Scientist Dr. Einstein owns a poultry farm[¥]. He is the sole proprietor and manages the whole business. Now he is counting how many eggs the hens have laid? He has opened a distribution box and putting eggs to it^ç. As each tray of the distribution box can hold 20 eggs each, he will have no difficulty[¤] in counting the eggs in this manner. When ever a customer comes, he provides personal service. Everything was going fine until one hen named Penthi^Þ decided to lay eggs directly in the distribution boxes. Now he has got a problem. It was just impossible to count and simultaneously keep an eye on Penthi. He appoints a manager M/s Biplab Egg Centre^ß to look after the management of the firm. A counting clerk is also appointed just for the purpose of counting of the eggs.

The main task of Biplab is to manage the farm by providing almost equal level of satisfaction to all workers, hens and also Mr. Rohit Bhujawala^Σ who has opened an omelette's centre just in front of Dr. Einstein's farm.

Now for the problem . . .

To give the users equal satisfaction and also to keep proper record of activities, Biplab opens a record book. He allows all users in simultaneously, and goes round and round^õ seeing and recording activities one after another. Counting clerk is counting the eggs, egg collectors are collecting eggs, Penthi as a special user directly lays eggs in the distribution box and Rohit Bhujawala is directly taking eggs from distribution boxes to prepare omelette. Biplab recorded all the activities but at the end of the day all records are in a hotchpotch state. Now let's see what problems have occurred:-

1. While the counting clerk was busy in counting, Penthi came and laid an egg in the distribution box and left. Biplab took note of it but at the end of the day what ever the clerk said was taken into consideration and as the clerk did not know about the egg laying, he did not count the egg of Penthi along with other eggs.¹
2. Rohit Bhujawala took 10 eggs to make omelette and Biplab took note of it. The counting clerk started his work. However Rohit had a problem, his gas refill did not arrive so his business has got problem and he has to return the eggs. However the counting clerk continued and Biplab took note of the final count by the counting clerk, in this manner the count for the 10 eggs were lost.²
3. While a worker was replacing defective eggs in boxes, the counting clerk started a calculation to calculate how many brown eggs in average are there in each box. He collected his data from some finished and some unfinished boxes.³

¥ This is the actual database.

ç Operation is being made on the database.

¤ Yes! this is a single user system. Only one user is operating on the database. In fact, he is the only user.

Þ Welcome to the multiuser system! Another user has entered in to manipulate the DB.

ß He is the Scheduler

Σ All are different users

õ Round Robin Schedule.

1 Lost Update problem

2 This shows a dirty read problem where the clerk calculated on a temporary information

3 This shows the incorrect summary problem through unrepeatable read.