

Report: Database Transaction Processing System

Introduction:

This report will discuss the implementation process of a given transaction. This is done by reading a given CSV file containing employee data, then we the transaction and update the data where appropriate. This process vaters to the possibility of error with a system that triggers a secory process to restore the database to an earlier version if needed. The system simulates random errors during individual transactions.

Design Structure:

We used the Pandas Dataframe to store employee data. We saved this data in df and df2, one serving as the main data structure in our code and the second one serving as a recovery backup to restore an earlier state of the database for recovery purposes.

Additionally, we structured transactions to be lists of lists in an array. The inner list represented the an individual transaction.

Implementation details

We had a total of 4 functions.

Main(): Utilized other functions in conjunction to read the csv file, process transactions and enter recovery when needed.

search_transactions() searches for matching row in the csv file dataframe based on given transactions.

is_there_a_failure() simulates a random failure.

recovery_scrip() Is called when recovery is needed. Restores datafram to an earlier state in cases on error.

Sample Outputs:

Initial Dataframe:

```
Unique_ID,First_name,Last_name,Salary,Department,Civil_status
1,John,Lennon,230000,Projects,Married
2,Joan,Doe,100000,Human Resources,Single
3,Mary,Carpenter,250000,Projects,Separated
4,John,Ingham,125000,Projects,Separated
5,Rachel,Sturgeon,197000,Engineering,Married
6,Hanifa,Salima,50000,Engineering,Married
7,Femi,Okeke,425000,Industries,Married
8,Mia,Khalifa,325000,Industries,Married
9,Katy,Jones,475000,Management,Single
10,Lin,Wang,435000,Engineering,Married
11,Art,Blanket,137000,Projects,Single
12,Vivek,Ramaswamy,231000,Industries,Married
13,Amal,Khan,230000,Projects,Single
14,Richard,Carpenter,123000,Human Resources,Single
```

```
15,Ryuichi,Sakamoto,521000,Processing Facilities,Single
```

Transaction Processing

Processing transaction No. 1.

Value Changed to:

Music

Updated DB:

	Unique_ID	First_name ...	Department	Civil_status
0	1	John ...	Music	Married
1	2	Joan ...	Human Resources	Single
2	3	Mary ...	Projects	Separated
3	4	John ...	Projects	Separated
4	5	Rachel ...	Engineering	Married
5	6	Hanifa ...	Engineering	Married
6	7	Femi ...	Industries	Married
7	8	Mia ...	Industries	Married
8	9	Katy ...	Management	Single
9	10	Lin ...	Engineering	Married
10	11	Art ...	Projects	Single
11	12	Vivek ...	Industries	Married
12	13	Amal ...	Projects	Single
13	14	Richard ...	Human Resources	Single
14	15	Ryuichi ...	Processing Facilities	Single

[15 rows x 6 columns]

UPDATES have not been committed yet...

Transaction No. 1 has been committed! Changes are permanent.

Failure Recovery:

Processing transaction No. 1.

Value Changed to:

Music

Updated DB:

	Unique_ID	First_name ...	Department	Civil_status
0	1	John ...	Music	Married
1	2	Joan ...	Human Resources	Single
2	3	Mary ...	Projects	Separated

3	4	John ...	Projects	Separated
4	5	Rachel ...	Engineering	Divorced
5	6	Hanifa ...	Engineering	Married
6	7	Femi ...	Industries	Married
7	8	Mia ...	Industries	Married
8	9	Katy ...	Management	Single
9	10	Lin ...	Engineering	Married
10	11	Art ...	Projects	Single
11	12	Vivek ...	Industries	Married
12	13	Amal ...	Projects	Single
13	14	Richard ...	Human Resources	Single
14	15	Ryuichi ...	Processing Facilities	Single

[15 rows x 6 columns]

UPDATES have not been committed yet...

Calling your recovery script with DB_Log as an argument.

Recovery in process ...

entered recovery

	Unique_ID	First_name ...	Department	Civil_status
0	1	John ...	Projects	Married
1	2	Joan ...	Human Resources	Single
2	3	Mary ...	Projects	Separated
3	4	John ...	Projects	Separated
4	5	Rachel ...	Engineering	Married
5	6	Hanifa ...	Engineering	Married
6	7	Femi ...	Industries	Married
7	8	Mia ...	Industries	Married
8	9	Katy ...	Management	Single
9	10	Lin ...	Engineering	Married
10	11	Art ...	Projects	Single
11	12	Vivek ...	Industries	Married
12	13	Amal ...	Projects	Single
13	14	Richard ...	Human Resources	Single
14	15	Ryuichi ...	Processing Facilities	Single

[15 rows x 6 columns]

Changes have been rolled back to the last committed transaction

There was a failure whilst processing transaction \ No. 1.

Calling your recovery script with DB_Log as an argument.

Recovery in process ...

entered recovery

	Unique_ID	First_name ...	Department	Civil_status
0	1	John ...	Projects	Married
1	2	Joan ...	Human Resources	Single
2	3	Mary ...	Projects	Separated
3	4	John ...	Projects	Separated
4	5	Rachel ...	Engineering	Married
5	6	Hanifa ...	Engineering	Married
6	7	Femi ...	Industries	Married
7	8	Mia ...	Industries	Married
8	9	Katy ...	Management	Single
9	10	Lin ...	Engineering	Married
10	11	Art ...	Projects	Single
11	12	Vivek ...	Industries	Married
12	13	Amal ...	Projects	Single
13	14	Richard ...	Human Resources	Single
14	15	Ryuichi ...	Processing Facilities	Single

[15 rows x 6 columns]

Changes have been rolled back to the last committed transaction

The data entries AFTER updates -and RECOVERY, if necessary-are presented below: