Assessment 1: Big Data HDFS Assessment

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a) Create a directory /hadoop/hdfs/ in HDFS

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir -p /hadoop/hdfs/
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /temp
mkdir: `/temp': File exists
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /temp1
hadoop@hadoop-VirtualBox:~$ hdfs dfs -rmdir /temp1
hadoop@hadoop-VirtualBox:~$
```

b) Create a temp directory in hdfs /temp and run HDFS command to delete “temp” directory.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir -p /hadoop/hdfs/
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /temp
mkdir: `/temp': File exists
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /temp1
hadoop@hadoop-VirtualBox:~$ hdfs dfs -rmdir /temp1
hadoop@hadoop-VirtualBox:~$
```

c) Command to list recursively all files in hadoop directory and all subdirectories in hadoop directory

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir -p /hadoop/hdfs/
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /temp
mkdir: `/temp': File exists
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /temp1
hadoop@hadoop-VirtualBox:~$ hdfs dfs -rmdir /temp1
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /
Found 9 items
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 13:02 /dummydir
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 21:05 /hadoop
drwxr-xr-x   - hadoop supergroup          0 2022-11-21 15:25 /hbase
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 10:16 /hdfs
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 20:54 /hdfs1
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 11:57 /newdir
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 11:26 /temp
drwxrwxrwx   - hadoop supergroup          0 2022-11-21 15:12 /tmp
drwxr-xr-x   - hadoop supergroup          0 2022-11-21 15:11 /user
hadoop@hadoop-VirtualBox:~$
```

d) List all the directory inside /hadoop/hdfs/ directory which starts with 'dir'.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /hadoop/hdfs/ | grep '/hadoop/h
dfs/dir'
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /hadoop/hdfs/ | grep '^d' | gre
p '/dir'
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /hadoop/hdfs/ | grep '^d' | gre
p '/dir'
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /
Found 10 items
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 21:10 /dirtemp
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 13:02 /dummydir
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 21:05 /hadoop
drwxr-xr-x   - hadoop supergroup          0 2022-11-21 15:25 /hbase
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 10:16 /hdfs
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 20:54 /hdfs1
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 11:57 /newdir
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 11:26 /temp
drwxrwxrwx   - hadoop supergroup          0 2022-11-21 15:12 /tmp
drwxr-xr-x   - hadoop supergroup          0 2022-11-21 15:11 /user
```

e) Create a temp.txt file. Copies this file from local file system to HDFS

```
hadoop@hadoop-VirtualBox:~$ nano temp1.txt
hadoop@hadoop-VirtualBox:~$ hdfs dfs -copyFromLocal temp1.txt /hadoop/hd
fs
hadoop@hadoop-VirtualBox:~$ hdfs dfs -cat /hadoop/hdfs/temp1.txt
this is assessment 1 of the data engineering internship
hadoop@hadoop-VirtualBox:~$
```

f) Command to move from local directory source to Hadoop directory.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /trial
hadoop@hadoop-VirtualBox:~$ hdfs dfs -cp /hadoop/hdfs/temp1.txt /trial
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mv /hadoop/hdfs/temp1.txt /trial
mv: `/trial/temp1.txt': File exists
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /
Found 11 items
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 21:10 /dirtemp
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 13:02 /dummydir
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 21:05 /hadoop
drwxr-xr-x   - hadoop supergroup          0 2022-11-21 15:25 /hbase
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 10:16 /hdfs
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 20:54 /hdfs1
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 11:57 /newdir
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 11:26 /temp
drwxrwxrwx   - hadoop supergroup          0 2022-11-21 15:12 /tmp
drwxr-xr-x   - hadoop supergroup          0 2025-07-10 21:19 /trial
drwxr-xr-x   - hadoop supergroup          0 2022-11-21 15:11 /user
hadoop@hadoop-VirtualBox:~$ hdfs dfs -ls /trial
Found 1 items
-rw-r--r--   1 hadoop supergroup         56 2025-07-10 21:19 /trial/temp
1.txt
hadoop@hadoop-VirtualBox:~$
```

g) Display the content of the HDFS file test on your /user/hadoop2 directory.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir -p  /user/hadoop2
hadoop@hadoop-VirtualBox:~$ nano test.txt
hadoop@hadoop-VirtualBox:~$ hdfs dfs -copyFromLocal test.txt /user/hadoo
p2
hadoop@hadoop-VirtualBox:~$ hdfs dfs -cat /user/hadoop2/test
cat: `/user/hadoop2/test': No such file or directory
hadoop@hadoop-VirtualBox:~$ hdfs dfs -cat /user/hadoop2/test.txt
this is an assessment
hadoop@hadoop-VirtualBox:~$
```

h) Upload a compressed file restaurant_dataset.zip to HDFS directory /restautant and then unzip it inside HDFS (not locally). Is it possible? Justify your answer with commands or explanation.

-- it is not possible to unzip it inside the HDFS . it should be Downloaded to the local. It should then be unzipped and uploaded to the uncompressed files

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -mkdir /restaurant
hadoop@hadoop-VirtualBox:~$ hdfs dfs -put restaurants-dataset.json /rest
aurant
hadoop@hadoop-VirtualBox:~$ hdfs dfs -put restaurants-dataset.json /rest
aurant/
put: `/restaurant/restaurants-dataset.json': File exists
hadoop@hadoop-VirtualBox:~$ hdfs dfs -put /home/hadoop/Do
Documents/ Downloads/
hadoop@hadoop-VirtualBox:~$ hdfs dfs -put /home/hadoop/Downloads/restaur
ant.zip /restaurant/
```

i) Append the content of a local file test1.txt to a hdfs file test2.txt.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -touchz /hadoop/hdfs/test1.txt
hadoop@hadoop-VirtualBox:~$ echo "this is a new file" > test2.txt
hadoop@hadoop-VirtualBox:~$ ls
airflow      Downloads         Music                    Templates
airflow_env  dummy.txt         Pictures                 test2.txt
derby.log    examples.desktop  Public                   test.txt
Desktop      mapreduce         restaurants-dataset.json  textfile.txt
Documents    metastore_db      temp1.txt                Videos
hadoop@hadoop-VirtualBox:~$ hdfs dfs -appendToFile test2.txt /hadoop/hdf
s/test1.txt
hadoop@hadoop-VirtualBox:~$ hdfs dfs -cat /hadoop/hdfs/test1.txt
this is a new file
hadoop@hadoop-VirtualBox:~$
```

J)Show the capacity, free and used space of the filesystem

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -df /
Filesystem                  Size      Used    Available  Use%
hdfs://localhost:9000  41954803712  48566272  24512598016    0%
hadoop@hadoop-VirtualBox:~$ hdfs dfs -df -h /
Filesystem               Size    Used  Available  Use%
hdfs://localhost:9000  39.1 G  46.3 M     22.8 G    0%
hadoop@hadoop-VirtualBox:~$
```

k) Shows the capacity, free and used space of the filesystem. Add parameter Formats the sizes of files in a human-readable fashion.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -df /
Filesystem                  Size      Used    Available  Use%
hdfs://localhost:9000  41954803712  48566272  24512598016    0%
hadoop@hadoop-VirtualBox:~$ hdfs dfs -df -h /
Filesystem               Size    Used  Available  Use%
hdfs://localhost:9000  39.1 G  46.3 M     22.8 G    0%
hadoop@hadoop-VirtualBox:~$
```

l) Show the amount of space, in bytes, used by the files that match the specified file pattern.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -du /
0         /dirtemp
11881022  /dummydir
75        /hadoop
14094     /hbase
11881076  /hdfs
0         /hdfs1
11881022  /newdir
12323876  /restaurant
78        /temp
0         /tmp
56        /trial
22        /user
hadoop@hadoop-VirtualBox:~$
```

m) Show the amount of space, in bytes, used by the files that match the specified file pattern. Formats the sizes of files in a human-readable fashion.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -du -h /
0       /dirtemp
11.3 M  /dummydir
75      /hadoop
13.8 K  /hbase
11.3 M  /hdfs
0       /hdfs1
11.3 M  /newdir
11.8 M  /restaurant
78      /temp
0       /tmp
56      /trial
22      /user
hadoop@hadoop-VirtualBox:~$
```

n) Check the health of the Hadoop file system.

```
hadoop@hadoop-VirtualBox:~$ hdfs fsck /
Connecting to namenode via http://localhost:50070/fsck?ugi=hadoop&path=%2F
FSCK started by hadoop (auth:SIMPLE) from /127.0.0.1 for path / at Thu Jul 10 21:44:38 IST
 2025
.....................
/newdir/restaurants-dataset.json:  Under replicated BP-1998725987-127.0.1.1-1668676850545:
blk_1073741839_1015. Target Replicas is 3 but found 1 replica(s).
.....Status: HEALTHY
 Total size:    47981321 B
 Total dirs:    46
 Total files:   26
 Total symlinks:                0
 Total blocks (validated):      25 (avg. block size 1919252 B)
 Minimally replicated blocks:   25 (100.0 %)
 Over-replicated blocks:        0 (0.0 %)
 Under-replicated blocks:       1 (4.0 %)
 Mis-replicated blocks:         0 (0.0 %)
 Default replication factor:    1
 Average block replication:     1.0
 Corrupt blocks:                0
 Missing replicas:              2 (7.4074073 %)
 Number of data-nodes:          1
 Number of racks:               1
FSCK ended at Thu Jul 10 21:44:38 IST 2025 in 6 milliseconds
```

o) Create a file named hdfstest.txt and change it number of replications to 3.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -setrep 3 /hadoop/hdfs/test1.txt
Replication 3 set: /hadoop/hdfs/test1.txt
hadoop@hadoop-VirtualBox:~$
```

p) Write command to display number of replicas for hdfstest.txt file.

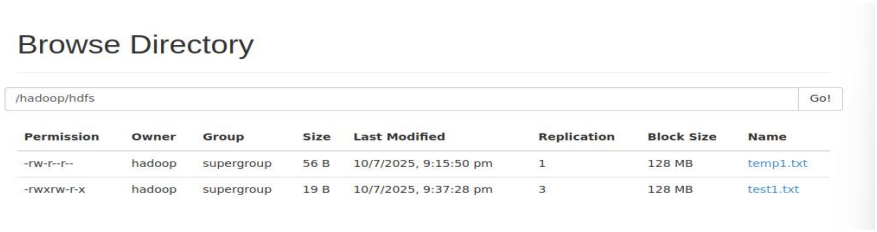
```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -stat %r /hadoop/hdfs/test1.txt
3
hadoop@hadoop-VirtualBox:~$
```

q) Write command to Display the status of file “hdfstest.txt” like block size, filesize in bytes

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -stat /hadoop/hdfs/test1.txt
2025-07-10 16:07:28
hadoop@hadoop-VirtualBox:~$
```

r) Write HDFS command to change file permission from rw – r – r to rwx-rw-x for hdfstest.txt.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -chmod 765 /hadoop/hdfs/test1.txt
hadoop@hadoop-VirtualBox:~$
```



Browse Directory

/hadoop/hdfs Go!

Permission	Owner	Group	Size	Last Modified	Replication	Block Size	Name
-rw-r--r--	hadoop	supergroup	56 B	10/7/2025, 9:15:50 pm	1	128 MB	temp1.txt
-rwxrw-r-x	hadoop	supergroup	19 B	10/7/2025, 9:37:28 pm	3	128 MB	test1.txt

s) Find all files with .csv extenstion and delete all empty files (0 bytes) in HDFS under /hadoop/.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -find / -name "*.csv"
hadoop@hadoop-VirtualBox:~$ hdfs dfs -find / -name "*.txt"
/dummydir/tempfile.txt
/hadoop/hdfs/temp1.txt
/hadoop/hdfs/test1.txt
/hdfs/textfile.txt
/newdir/dummyval.txt
/temp/tempfile.txt
/trial/temp1.txt
/user/hadoop2/test.txt
hadoop@hadoop-VirtualBox:~$
```

t) Create a snapshot-enabled directory /snapshotdir/. Take a snapshot and delete the snapshot.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfsadmin -allowSnapshot /hadoop/hdfs
Allowing snaphot on /hadoop/hdfs succeeded
hadoop@hadoop-VirtualBox:~$ hdfs dfs -createSnapshot /hadoop/hdfs
Created snapshot /hadoop/hdfs/.snapshot/s20250710-215629.419
hadoop@hadoop-VirtualBox:~$ hdfs dfs -deleteSnapshot /hadoop/hdfs
-deleteSnapshot: Incorrect number of arguments.
Usage: hadoop fs [generic options] -deleteSnapshot <snapshotDir> <snapshotName>
hadoop@hadoop-VirtualBox:~$
```

u) Execute a command to generate checksum for an HDFS file hdfstest.txt and explain its purpose.

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -checksum /hadoop/hdfs/test1.txt
/hadoop/hdfs/test1.txt  MD5-of-0MD5-of-512CRC32C        000002000000000000000000a513a57049
a452d5312956f5291bab68
hadoop@hadoop-VirtualBox:~$
```

v) Change the blocksize of already existing file in /hadoop/hdfs directory. Is it possible? Justify your answer with commands or explanation.

=> it is Not possible to change the block size directly of an already uploaded file in HDFS

```
hadoop@hadoop-VirtualBox:~$ hdfs dfs -Ddfs.blocksize=67108864 -put test.txt /newdir/
hadoop@hadoop-VirtualBox:~$
```

Assessment 2 - Employee Attrition Analysis

Create database “hremployeedb” and create a table “hremp”. Insert all records from file.

1. Create database

```
CREATE DATABASE hremployeedb;
USE hremployeedb;
```

2.create table

```
CREATE TABLE hremp (
   Attrition VARCHAR(10),
   Business_Travel VARCHAR(50),
   CF_age_band VARCHAR(50),
   CF_attrition_label VARCHAR(50),
   Department VARCHAR(50),
   Education_Field VARCHAR(50),
   emp_no VARCHAR(20),
   Employee_Number INT,
   Gender VARCHAR(10),
   Job_Role VARCHAR(50),
   Marital_Status VARCHAR(20),
   Over_Time VARCHAR(10),
   Over18 VARCHAR(5),
   Training_Times_Last_Year INT,
   Age INT,
   CF_current_Employee VARCHAR(5),
   Daily_Rate INT,
   Distance_From_Home INT,
   Education INT,
   Employee_Count INT,
   Environment_Satisfaction INT,
   Hourly_Rate INT,
   Job_Involvement INT,
   Job_Level INT,
   Job_Satisfaction INT,
   Monthly_Income INT,
   Monthly_Rate INT,
   Num_Companies_Worked INT,
   Percent_Salary_Hike INT,
   Performance_Rating INT,
   Relationship_Satisfaction INT,
   Standard_Hours INT,
   Stock_Option_Level INT,
   Total_Working_Years INT,
   Work_Life_Balance INT,
   Years_At_Company INT,
   Years_In_Current_Role INT,
   Years_Since_Last_Promotion INT,
   Years_With_Curr_Manager INT
);
```

a) Calculate the cumulative sum of total working years for each department

SELECT Department, `Employee Number`,`Total Working Years`, SUM(`Total Working Years`) OVER (PARTITION BY Department ORDER BY `Employee Number`) AS Cumulative_Total_Working_Years FROM hremp;

Department	Employee Number	Total Working Years	Cumulative_Total_Working_Years
HR	103	16	16
HR	133	7	23
HR	140	30	53
HR	148	23	76
HR	177	8	84
HR	184	12	96

b) Most frequent marital status among employees who left (Attrition = 'Yes')

SELECT `Marital Status`, COUNT(*) AS Count_Leaving FROM hremp WHERE `CF_attrition label` = 'Ex-Employees' GROUP BY `Marital Status` ORDER BY Count_Leaving DESC LIMIT 1;

Marital Status	Count_Leaving
Single	120

c) Show the Job Role with Highest Attrition Rate (Percentage)

SELECT `Job Role`, ROUND(SUM(CASE WHEN `CF_attrition label` = 'Ex-Employees' THEN 1 ELSE 0 END) * 100.0 / COUNT(*), 2) AS Attrition_Percentage FROM hremp GROUP BY `Job Role` ORDER BY Attrition_Percentage DESC LIMIT 1;

Job Role	Attrition_Percentage
Sales Representative	39.76

d) Show distribution of Employee's Promotion, Find the maximum chances of employee getting promoted.

SELECT `Years Since Last Promotion`, COUNT(*) AS Employee_Count FROM hremp GROUP BY `Years Since Last Promotion` ORDER BY Employee_Count DESC;

Years Since Last Promotion	Employee_Count
0	581
1	357
2	159
7	76
4	61

e) Show the cumulative sum of total working years for each department.

SELECT `Department`, `Employee Number`, `Total Working Years`, SUM(`Total Working Years`) OVER (PARTITION BY `Department` ORDER BY `Employee Number`) AS Cumulative_Total_Working_Years FROM hremp;

Department	Employee Number	Total Working Years	Cumulative_Total_Working_Years
HR	103	16	16
HR	133	7	23
HR	140	30	53
HR	148	23	76
HR	177	8	84
HR	184	12	96

f) Find the rank of employees within each department based on their monthly income

SELECT `Department`, `Employee Number`, `Monthly Income`, RANK() OVER (PARTITION BY `Department` ORDER BY `Monthly Income` DESC) AS Income_Rank FROM hremp;

Department	Employee Number	Monthly Income	Income_Rank
HR	1338	19717	1
HR	1625	19658	2
HR	1973	19636	3
HR	734	19189	4
HR	731	19141	5
HR	140	18844	6

g) Calculate the running total of 'Total Working Years' for each employee within each department and age band.

SELECT `Department`, `CF_age band`, `Employee Number`, `Total Working Years`, SUM(`Total Working Years`) OVER (PARTITION BY `Department`, `CF_age band` ORDER BY `Employee Number`) AS Running_Total_Working_Years FROM hremp;

Department	CF_age band	Employee Number	Total Working Years	Running_Total_Working_Years
HR	25 - 34	177	8	8
HR	25 - 34	184	12	20
HR	25 - 34	424	9	29
HR	25 - 34	590	11	40
HR	25 - 34	608	8	48
HR	25 - 34	847	4	52

h) Foreach employee who left the organisation (Attrition = Yes), calculate the number of years they worked before leaving and compare it with the average years worked by employees in the same department

```
SELECT h.`Employee Number`, h.`Department`, h.`Years At Company`, AVG(h2.`Years At Company`) AS Avg_Years_In_Department FROM hremp h JOIN hremp h2 ON h.`Department` = h2.`Department` WHERE h.`CF_attrition label` = 'Ex-Employees' GROUP BY h.`Employee Number`, h.`Department`, h.`Years At Company`;
```

Employee Number	Department	Years At Company	Avg_Years_In_Department
1702	Sales	3	7.2848
1667	Sales	11	7.2848
1758	Sales	0	7.2848
1489	Sales	15	7.2848
1869	Sales	8	7.2848

i) Find the if there is any relation between Attrition Rate and Marital Status of Employee.

```
SELECT `Marital Status`, COUNT(*) AS Total_Employees, SUM(CASE WHEN `CF_attrition label` = 'Ex-Employees' THEN 1 ELSE 0 END) AS Employees_Left, ROUND(SUM(CASE WHEN `CF_attrition label` = 'Ex-Employees' THEN 1 ELSE 0 END) * 100.0 / COUNT(*), 2) AS Attrition_Rate FROM hremp GROUP BY `Marital Status`;
```

Marital Status	Total_Employees	Employees_Left	Attrition_Rate
Single	470	120	25.53
Married	673	84	12.48
Divorced	327	33	10.09

j) Divide employees into 5 groups based on training times last year [Use NTILE ()]

```
SELECT `Employee Number`, `Training Times Last Year`, NTILE(5) OVER (ORDER BY `Training Times Last Year`) AS Training_Group FROM hremp;
```

Employee Number	Training Times Last Year	Training_Group
1	0	1
56	0	1
58	0	1
90	0	1
125	0	1
178	0	1

k) Categorize employees based on training times last year as - Frequent Trainee, Moderate Trainee, Infrequent Trainee.

```
SELECT `Employee Number`, `Training Times Last Year`, CASE WHEN `Training Times Last Year` >= 5 THEN 'Frequent Trainee' WHEN `Training Times Last Year` BETWEEN 3 AND 4 THEN 'Moderate Trainee' ELSE 'Infrequent Trainee' END AS Trainee_Category FROM hremp;
```

Employee Number	Training Times Last Year	Trainee_Category
1	0	Infrequent Trainee
2	3	Moderate Trainee
4	3	Moderate Trainee
5	3	Moderate Trainee
7	3	Moderate Trainee
8	2	Infrequent Trainee

l) Use a CASE WHEN statement to categorize employees into 'Poor', 'Fair', 'Good', or 'Excellent' work-life balance based on their work-life balance score.

```
SELECT `Employee Number`, `Work Life Balance`, CASE WHEN `Work Life Balance` = 1 THEN 'Poor' WHEN `Work Life Balance` = 2 THEN 'Fair' WHEN `Work Life Balance` = 3 THEN 'Good' WHEN `Work Life Balance` = 4 THEN 'Excellent' ELSE 'Unknown' END AS Work_Life_Balance_Category FROM hremp;
```

Employee Number	Work Life Balance	Work_Life_Balance_Category
1	1	Poor
2	3	Good
4	3	Good
5	3	Good
7	3	Good
8	2	Fair

m) Find all possible key reasons for Attrition in Company. Conclude with evidence and explain your answer.

```
SELECT `Over Time`, `Job Satisfaction`, `Environment Satisfaction`, `Work Life Balance`, AVG(CASE WHEN `CF_attrition label` = 'Ex-Employees' THEN 1 ELSE 0 END) * 100 AS Attrition_Rate FROM hremp GROUP BY `Over Time`, `Job Satisfaction`, `Environment Satisfaction`, `Work Life Balance` ORDER BY Attrition_Rate DESC;
```

Over Time	Job Satisfaction	Environment Satisfaction	Work Life Balance	Attrition_Rate
Yes	3	2	4	100.0000
Yes	4	1	1	100.0000
Yes	1	4	1	100.0000
Yes	2	3	1	100.0000
Yes	2	1	4	100.0000
Yes	1	1	1	100.0000