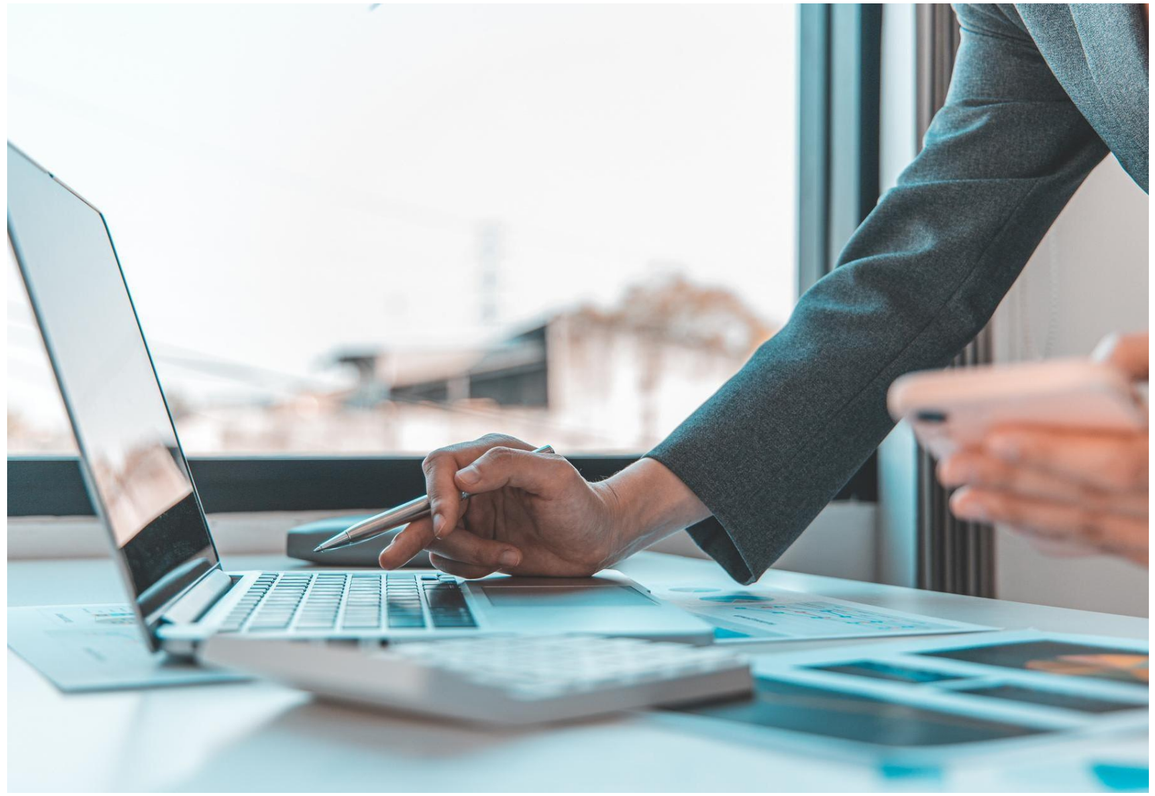
Internship Program: Soulvibe.Tech

“Higher Education Course Analysis using SQL”

Batch Name: SVT/DAINT/2025/06-B10

Introduction



Overview of the main objectives

In this task, I was asked to analyze Higher education course data using SQL. The objective was to derive meaningful business insights by writing queries to filter, group, and summarize the data. This helps in understanding the distribution of colleges and courses across districts and universities and also the structure of course offerings by duration, category and type.

1 Find top5 districts with highest no.of colleges offering prof. courses

SQL 1*

```sql
SELECT District, COUNT(DISTINCT [College Name]) AS CollegeCount
FROM CollegeCourses
WHERE [Is Professional] = 'Professional Course'
GROUP BY District
ORDER BY CollegeCount DESC
LIMIT 5;
```

	District	CollegeCount
1	Pune	620
2	Nagpur	309
3	Nashik	206
4	Ahmednagar	203
5	Aurangabad	194

2 Calculate the average course duration (in months) for each Course Type and sort them in descending order.

SQL 1* SQL 2*

```
1  SELECT [Course Type], AVG([Course Duration (In months)]) AS AvgDuration
2  FROM CollegeCourses
3  GROUP BY [Course Type]
4  ORDER BY AvgDuration DESC;
```

	Course Type	AvgDuration
1	DUAL Degree	54.9836065573771
2	Ph.D	52.4307692307692
3	Under Graduate Course	38.6023807621635
4	Diploma Course	32.1285225177772
5	Post Graduate Course	24.8091580502216
6	Post Graduate Diploma Course	21.1926605504587
7	Vocational Course	19.763075400099

3 Count how many unique College Names offer each Course Category.

SQL 1* SQL 2* SQL 3*

```
1  SELECT [Course Category], COUNT(DISTINCT [College Name]) AS CollegeCount
2  FROM CollegeCourses
3  GROUP BY [Course Category];
```

	Course Category	CollegeCount
1	ARCHITECTURE AND TOWN PLANNING	99
2	Agriculture	136
3	Arts	7643
4	Commerce	3995
5	Education	1208
6	Engineering	834
7	Health Science	360

4 Find the names of colleges offering both Post Graduate and Under Graduate courses.

SQL 1* | SQL 2* | SQL 3* | SQL 4*

```
1  SELECT [College Name]
2  FROM CollegeCourses
3  WHERE [Course Type] IN ('Under Graduate Course', 'Post Graduate Course')
4  GROUP BY [College Name]
5  HAVING COUNT(DISTINCT [Course Type]) = 2;
```

	College Name
1	A.T.S.P. MANDAL'S Arts, Commerce & …
2	A.V.COLLEGE ARTS, K.M. COLLEGE OF …
3	ADARSH COLLEGE OF ARTS & COMMERCE
4	ALI YAVAR JUNG NATIONAL INSTITUTE
5	ALL INDIA INSTITUTE OF PHYSICAL …
6	ANANTRAO PAWAR COLLEGE OF ENGINEERIN…
7	ANIKET SOCIAL WORK COLLEGE, DESAIGAN…

```
Execution finished without errors.
Result: 1610 rows returned in 426ms
```

5 List all universities that have more than 10 unaided courses that are not professional.

1.sql | 2.sql | 3.sql | 4.sql | SQL 5*

```
1  SELECT University
2  FROM CollegeCourses
3  WHERE [Course (Aided / Unaided)] = 'Unaided' AND [Is Professional] = 'Non-Professional Course'
4  GROUP BY University
5  HAVING COUNT(*) > 10;
6
```

University

```
Execution finished without errors.
Result: 0 rows returned in 81ms
```

6 Display colleges from the "Engineering" category that have at least one course with a duration greater than the category's average.

1.sql | 2.sql | 3.sql | 4.sql | 5.sql | 6.sql

```sql
WITH AvgDur AS (
    SELECT AVG([Course Duration (In months)]) AS AvgEnggDur
    FROM CollegeCourses
    WHERE [Course Category] = 'Engineering'
)
SELECT DISTINCT [College Name]
FROM CollegeCourses, AvgDur
WHERE [Course Category] = 'Engineering'
AND [Course Duration (In months)] > AvgEnggDur;
```

	College Name
1	Government College of Engineering, …
2	Sant Gadge Baba Amravati …
3	Government College of Engineering …
4	Shri Sant Gajanan Maharaj College of…
5	Prof. Ram Meghe Institute of …
6	P. R. Pote (Patil) Education & …
7	P.R. Patil College of Engineering & …

```
Execution finished without errors.
Result: 397 rows returned in 154ms
```

7 Assign a rank to each course within a College Name based on course duration, longest first

1.sql | 2.sql | 3.sql | 4.sql | 5.sql | 6.sql | SQL 7*

```
1   SELECT [College Name], [Course Name], [Course Duration (In months)],
2          RANK() OVER (PARTITION BY [College Name] ORDER BY [Course Duration (In months)] DESC) AS DurationRank
3   FROM CollegeCourses;
```

	College Name	Course Name	Course Duration (In months)	DurationRank
1	(BHARAT RATNA) KHAN ABDUL GAFFAR …	11th Arts	12	1
2	(BHARAT RATNA) KHAN ABDUL GAFFAR …	12th Arts	12	1
3	(S.E.S.) S.D.OCHANI HIGH SCHOOL & JR…	12th Composite	12	1
4	(S.E.S.) S.D.OCHANI HIGH SCHOOL & JR…	11th Composite	12	1
5	A A DESAI HIGH SCHOOL BHAISHET	11th Composite	12	1
6	A A DESAI HIGH SCHOOL BHAISHET	12th Composite	12	1
7	A A PADHYE MADHYMIK ENGLISH MEDI. …	12th Commerce	12	1

```
Execution finished without errors.
Result: 60280 rows returned in 626ms
```

8 Find colleges where the longest and shortest course durations are more than 24 months apart.

8.sql

```sql
SELECT [College Name]
FROM CollegeCourses
GROUP BY [College Name]
HAVING MAX([Course Duration (In months)]) - MIN([Course Duration (In months)]) > 24;
```

	College Name
1	ADARSH COLLEGE OF ARTS & COMMERCE
2	Abhinav Law College
3	Adarsh Shikshan Prasarak Mandal's …
4	Adarsha Comprehensive College Of …
5	Akhil Bhartiya Maratha Shikshan …
6	Akola Law College, Akola
7	Anjuman-I-Islam's Kalsekar Technical…

```
Execution finished without errors.
Result: 166 rows returned in 234ms
```

9 Show the cumulative number of professional courses offered by each university sorted alphabetically.

8.sql 9.sql

```sql
SELECT University, COUNT(*) AS ProfessionalCourseCount
FROM CollegeCourses
WHERE [Is Professional] = 'Professional Course'
GROUP BY University
ORDER BY University ASC;
```

	University	ProfessionalCourseCount
1	AUTONOMOUS INSTITUTE	264
2	AUTONOMUS INSTITUTE OF GOVERNMENT OF…	59
3	All India Institute of Local Self-…	1
4	BHARATI VIDYAPEETH UNIVERSITY	20
5	CENTRAL GOVERNMENT	3
6	CIPET, Head Office, Chennai	8
7	DATTA MEGHE INSTITUTE OF MEDICAL …	4

```
Execution finished without errors.
Result: 43 rows returned in 99ms
```

10 Using a self-join or CTE, find colleges offering more than one course category.

8.sql 9.sql 10.sql

```sql
SELECT [College Name]
FROM CollegeCourses
GROUP BY [College Name]
HAVING COUNT(DISTINCT [Course Category]) > 1;
```

	College Name
1	A E S MAHESH VIDYALAYA VAMBORI
2	A T U CHAND SULTAN HIGH SCHOOL
3	A. K. PRA. & JR COLLEGE AMARAPUR
4	A.D. Institute of Science & …
5	A.D.KADAM UCCH MADHYMIK ASHRAMSHALA …
6	A.E.S Abhinav CBSE School
7	A.E.S Bhausaheb Firodiya Highschool.…

Execution finished without errors.
Result: 6325 rows returned in 233ms

11 Create a temporary table (CTE) that includes average duration of courses by district and use it to list talukas where the average course duration is above the district average.

8.sql | 9.sql | 10.sql | 11.sql

```sql
WITH DistrictAvg AS (
    SELECT District, AVG([Course Duration (In months)]) AS DistAvg
    FROM CollegeCourses
    GROUP BY District
), TalukaAvg AS (
    SELECT District, Taluka, AVG([Course Duration (In months)]) AS TalukaAvg
    FROM CollegeCourses
    GROUP BY District, Taluka
)
SELECT T.Taluka, T.District
FROM TalukaAvg T
JOIN DistrictAvg D ON T.District = D.District
WHERE T.TalukaAvg > D.DistAvg;
```

	Taluka	District
1	Aurangabad	Ahmednagar
2	Kopargaon	Ahmednagar
3	Nagar	Ahmednagar
4	Rahta	Ahmednagar
5	Sangamner	Ahmednagar
6	Shrigonda	Ahmednagar
7	Akola	Akola

```
Execution finished without errors.
Result: 117 rows returned in 182ms
```

12

Create a new column classifying course duration as:
Short (< 12 months)
Medium (12-36 months)
Long (> 36 months)
Then count the number of each duration type per course category.

8.sql | 9.sql | 10.sql | 11.sql | 12.sql

```sql
SELECT [Course Category],
       COUNT(CASE WHEN [Course Duration (In months)] < 12 THEN 1 END) AS Short,
       COUNT(CASE WHEN [Course Duration (In months)] BETWEEN 12 AND 36 THEN 1 END) AS Medium,
       COUNT(CASE WHEN [Course Duration (In months)] > 36 THEN 1 END) AS Long
FROM CollegeCourses
GROUP BY [Course Category];
```

	Course Category	Short	Medium	Long
1	ARCHITECTURE AND TOWN PLANNING	0	40	103
2	Agriculture	0	78	103
3	Arts	0	16815	100
4	Commerce	0	8621	2
5	Education	0	1317	6
6	Engineering	0	3805	2182
7	Health Science	0	273	356

```
Execution finished without errors.
Result: 18 rows returned in 92ms
```

13 Extract only the course specialization from Course Name. (e.g., from "Bachelor of Engineering (B. E.) - Electrical", extract "Electrical").

8.sql | 9.sql | 10.sql | 11.sql | 12.sql | 13.sql

```
1  SELECT [Course Name],
2         TRIM(SUBSTR([Course Name], INSTR([Course Name], '-') + 1)) AS Specialization
3  FROM collegeCourses
4  WHERE [Course Name] LIKE '%-%';
```

	Course Name	Specialization
1	Master of Engineering (M. E.) - …	Computer Science and Engineering
2	Master of Engineering (M. E.) - …	Electrical Power System
3	Master of Engineering (M. E.) - …	Thermal Power Engineering
4	Bachelor of Engineering (B. E.) - …	Information Technology
5	Bachelor of Engineering (B. E.) - …	Electrical Engineering
6	Bachelor of Engineering (B. E.) - …	Instrumentation Engineering
7	Master of Engineering (M. E.) - Geo …	Geo Technical Engineering

```
Execution finished without errors.
Result: 13214 rows returned in 207ms
```

14 Count how many courses include the word Engineering in the name.

8.sql | 9.sql | 10.sql | 11.sql | 12.sql | 13.sql | 14.sql*

```sql
SELECT COUNT(*) AS EngineeringCourseCount
FROM CollegeCourses
WHERE [Course Name] LIKE '%Engineering%';
```

	EngineeringCourseCount
1	5771

```
Execution finished without errors.
Result: 1 rows returned in 68ms
```

15 List all unique combinations of Course Name, Course Type, and Course Category.

8.sql | 9.sql | 10.sql | 11.sql | 12.sql | 13.sql | 14.sql* | 15.sql

```
1  SELECT DISTINCT [Course Name], [Course Type], [Course Category]
2  FROM CollegeCourses;
3
```

	Course Name	Course Type	Course Category
1	Master of Engineering (M. E.) - …	Post Graduate Course	Engineering
2	Master of Engineering (M. E.) - …	Post Graduate Course	Engineering
3	Master of Engineering (M. E.) - …	Post Graduate Course	Engineering
4	Bachelor of Engineering (B. E.) - …	Under Graduate Course	Engineering
5	Bachelor of Engineering (B. E.) - …	Under Graduate Course	Engineering
6	Bachelor of Engineering (B. E.) - …	Under Graduate Course	Engineering
7	Master of Engineering (M. E.) - Geo …	Post Graduate Course	Engineering

```
Execution finished without errors.
Result: 1259 rows returned in 196ms
```

16 Write a query to get all courses that are not offered by any Government college.

8.sql | 9.sql | 10.sql | 11.sql | 12.sql | 13.sql | 14.sql* | 15.sql | 16.sql

```
1  SELECT *
2  FROM CollegeCourses
3  WHERE [College Type] != 'Government';
4
```

	Sr.No	District	Taluka	College Name	University	College Type
1	23	Amravati	Amravati	Sant Gadge Baba Amravati …	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department
2	24	Amravati	Amravati	Sant Gadge Baba Amravati …	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department
3	25	Amravati	Amravati	Sant Gadge Baba Amravati …	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department
4	26	Amravati	Amravati	Sant Gadge Baba Amravati …	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department
5	31	Amravati	Amravati	Shree Shivaji Education Society's Dr…	MAHARASHTRA STATE BOARD OF TECHNICAL…	Government-Aided
6	32	Amravati	Amravati	Shree Shivaji Education Society's Dr…	MAHARASHTRA STATE BOARD OF TECHNICAL…	Government-Aided

```
Execution finished without errors.
Result: 55288 rows returned in 643ms
```

17 Find the university that has the second-highest number of aided courses.

8.sql | 9.sql | 10.sql | 11.sql | 12.sql | 13.sql | 14.sql* | 15.sql | 16.sql | 17.sql

```sql
SELECT University, COUNT(*) AS AidedCourses
FROM CollegeCourses
WHERE [Course (Aided / Unaided)] = 'Aided'
GROUP BY University
ORDER BY AidedCourses DESC
LIMIT 1 OFFSET 1;
```

	University	AidedCourses
1	NCVT	3445

```
Execution finished without errors.
Result: 1 rows returned in 94ms
```

18 Show courses whose durations are above the median course duration.

```sql
WITH ordered_courses AS (
  SELECT *,
         PERCENT_RANK() OVER (ORDER BY [Course Duration (In months)]) AS pr
  FROM CollegeCourses
)
SELECT *
FROM ordered_courses
WHERE pr > 0.5;
```

	Sr.No	District	Taluka	College Name	University	Colleg
1	51821	Nagpur	Nagpur (Urban)	Kavikulaguru Kalidas Sanskrit …	Maharashtra Animal & Fishery Science…	Aided
2	51822	Nagpur	Nagpur (Urban)	Kavikulaguru Kalidas Sanskrit …	Maharashtra Animal & Fishery Science…	Aided
3	51827	Nagpur	Nagpur (Urban)	Kavikulaguru Kalidas Sanskrit …	Maharashtra Animal & Fishery Science…	Aided
4	51834	Nagpur	Nagpur (Urban)	Kavikulaguru Kalidas Sanskrit …	Maharashtra Animal & Fishery Science…	Aided
5	51835	Nagpur	Nagpur (Urban)	Kavikulaguru Kalidas Sanskrit …	Maharashtra Animal & Fishery Science…	Aided
6	51836	Nagpur	Nagpur (Urban)	Kavikulaguru Kalidas Sanskrit …	Maharashtra Animal & Fishery Science…	Aided

```
Execution finished without errors.
Result: 27298 rows returned in 1077ms
```

19 For each University, find the percentage of unaided courses that are professional.

8.sql | 9.sql | 10.sql | 11.sql | 12.sql | 13.sql | 14.sql* | 15.sql | 16.sql | 17.sql | 18.sql | 19.sql*

```sql
SELECT University,
       ROUND(
         SUM(CASE WHEN [Is Professional] = 'Professional Course' THEN 1 ELSE 0 END) * 100.0 / COUNT(*),
         2
       ) AS ProfessionalPercent
FROM CollegeCourses
WHERE [Course (Aided / Unaided)] = 'Unaided'
GROUP BY University;
```

University	ProfessionalPercent

```
Execution finished without errors.
Result: 0 rows returned in 89ms
```

20 Determine which Course Category has the highest average course duration and display the top 3.

9.sql | 10.sql | 11.sql | 12.sql | 13.sql | 14.sql* | 15.sql | 16.sql | 17.sql | 18.sql | 19.sql* | 20.sql

```
1  SELECT [Course Category],
2         AVG([Course Duration (In months)]) AS AvgDuration
3  FROM CollegeCourses
4  GROUP BY [Course Category]
5  ORDER BY AvgDuration DESC
6  LIMIT 3;
7
```

	Course Category	AvgDuration
1	ARCHITECTURE AND TOWN PLANNING	49.9300699300699
2	Health Science	46.0826709062003
3	Agriculture	40.707182320442

```
Execution finished without errors.
Result: 3 rows returned in 117ms
```

Conclusion

Through this SQL-based exploration of the table, I gained hands-on experience in extracting, filtering, grouping, and summarizing data effectively. By writing and analyzing 20 different queries, I was able to:

- Analyze the concentration of professional and non-professional courses across districts
- Compare average course durations by type and category
- Identify universities and colleges with diverse or specialized offerings

Key Takeaways:

•SQL is a powerful tool to perform deep data analysis with precision.
•Writing queries helped me understand the **structure and relationships** within the dataset.
•The results can inform decisions for **education planners, regulators, and university administrators**

Thank You