

Internship Program-
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**SQL- BASED ANALYTICAL
EXPLORATION OF INDIAN
COLLEGES**

Batch No: SVT/DAINT/2025/06-B10

Overview

The objective of this project is to perform in-depth SQL-based data analysis on a dataset representing higher education institutions, their courses, and classifications. By writing and executing 20 advanced SQL queries, we aim to uncover trends, patterns, and key metrics in the structure of college-level courses across districts and universities.



Q1: Top 5 districts with the highest number of colleges offering professional courses.

```
1  SELECT District, COUNT(DISTINCT CollegeName) AS ProfessionalCollegeCount
2  FROM college_courses
3  WHERE IsProfessional = 'Professional Course'
4  GROUP BY District
5  ORDER BY ProfessionalCollegeCount DESC
6  LIMIT 5;
```

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

Q2: Average course duration (in months) for each Course Type and sort descending.

```
1  SELECT CourseType, ROUND(AVG(CourseDuration), 2) AS AvgDuration
2  FROM college_courses
3  GROUP BY CourseType
4  ORDER BY AvgDuration DESC;
```

CourseType		AvgDuration
1	DUAL Degree	54.98
2	Ph.D	52.43
3	Under Graduate Course	38.6
4	Diploma Course	32.13
5	Post Graduate Course	24.81
6	Post Graduate Diploma Course	21.19

Q3: count of unique college names offering each Course Category.

```
1  SELECT CourseCategory, COUNT(DISTINCT CollegeName) AS UniqueCollegeCount
2  FROM college_courses
3  GROUP BY CourseCategory;
4
```

CourseCategory		UniqueCollegeCount
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

Q4: Colleges offering both Post Graduate and Under Graduate courses

1	SELECT CollegeName
2	FROM college_courses
3	WHERE CourseType IN ('Post Graduate Course', 'Under Graduate Course')
4	GROUP BY CollegeName
5	HAVING COUNT(DISTINCT CourseType) = 2;
6	

CollegeName	
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 MEDICI...
6	ANANTRAO PAWAR COLLEGE OF ...
7	ANIKET SOCIAL WORK COLLEGE. DESAIGA...

Q5: Universities with more than 10 unaided, non-professional courses

```
1 SELECT University
2 FROM college_courses
3 WHERE Course = 'UnAided' AND IsProfessional = 'Non-Professional Course'
4 GROUP BY University
5 HAVING COUNT(*) > 10;
6
```

University	
1	AUTONOMOUS INSTITUTE
2	DR. B. A. MARATHWADA UNIVERSITY
3	GONDWANA UNIVERSITY
4	KAVI KULGURU SANSKRIT ...
5	MAHARASHTRA STATE BOARD OF ...
6	MUMBAI UNIVERSITY
7	NCVT

Q6: Engineering colleges with at least one course above the average duration

```
1  WITH EngAvg AS (  
2      SELECT AVG(CourseDuration) AS AvgDuration  
3      FROM college_courses  
4      WHERE CourseCategory = 'Engineering'  
5  )  
6  SELECT DISTINCT CollegeName  
7  FROM college_courses, EngAvg  
8  WHERE CourseCategory = 'Engineering'  
9  AND CourseDuration > EngAvg.AvgDuration;
```

CollegeName	
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 Technology & ...
6	P. R. Pote (Patil) Education & Welfare Trust'...

Q7: Rank courses within a college based on course duration (longest first)

```
SELECT CollegeName, CourseName, CourseDuration,  
       RANK() OVER (PARTITION BY CollegeName ORDER BY CourseDuration DESC) AS DurationRank  
FROM college_courses;
```

.....				
CollegeName		CourseName	CourseDuration	DurationRank
	(BHARAT RATNA) KHAN ABDUL GAFFAR ...	11th Arts	12	1
	(BHARAT RATNA) KHAN ABDUL GAFFAR ...	12th Arts	12	1
	(S.E.S.) S.D.OCHANI HIGH SCHOOL & JR. ...	12th Composite	12	1
	(S.E.S.) S.D.OCHANI HIGH SCHOOL & JR. ...	11th Composite	12	1
	A A DESAI HIGH SCHOOL BHAISHET	11th Composite	12	1
	A A DESAI HIGH SCHOOL BHAISHET	12th Composite	12	1

Q8: Colleges where longest and shortest course durations differ by more than 24 months

```
SELECT CollegeName
FROM college_courses
GROUP BY CollegeName
HAVING MAX(CourseDuration) - MIN(CourseDuration) > 24;
```

CollegeName	
ADARSH COLLEGE OF ARTS & COMMERCE	
Abhinav Law College	
Adarsh Shikshan Prasarak Mandal's K.T. Pa...	
Adarsha Comprehensive College Of ...	
Akhil Bhartiya Maratha Shikshan Parishads...	
Akola Law College, Akola	

Q9: Cumulative number of professional courses offered by each university sorted alphabetically

```
1 SELECT University, COUNT(*) AS ProfessionalCourseCount
2 FROM college_courses
3 WHERE IsProfessional = 'Professional Course'
4 GROUP BY University
5 ORDER BY University;
6
```

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

Q10: Colleges offering more than one course category (using self-join)

```
1 SELECT DISTINCT A.CollegeName
2 FROM college_courses A
3 JOIN college_courses B
4   ON A.CollegeName = B.CollegeName AND A.CourseCategory <> B.CourseCategory;
5
```

CollegeName	
1	Government College of Engineering, ...
2	Sant Gadge Baba Amravati ...
3	Government Polytechnic, Amravati
4	Shri Sant Gajanan Maharaj College of ...
5	Vidya Bharati Mahavidyalaya Department ...
6	Prof. Ram Meghe Institute of Technology & ...

Q11: Talukas where average course duration is above district average

```
1 WITH DistrictAvg AS (  
2     SELECT District, AVG(CourseDuration) AS DistrictAvg  
3     FROM college_courses  
4     GROUP BY District  
5 ),  
6 TalukaAvg AS (  
7     SELECT District, Taluka, AVG(CourseDuration) AS TalukaAvg  
8     FROM college_courses  
9     GROUP BY District, Taluka  
10 )  
11 SELECT t.Taluka, t.District, t.TalukaAvg, d.DistrictAvg  
12 FROM TalukaAvg t  
13 JOIN DistrictAvg d ON t.District = d.District  
14 WHERE t.TalukaAvg > d.DistrictAvg;
```

	Taluka	District	TalukaAvg	DistrictAvg
1	Aurangabad	Ahmednagar	48.0	20.8815789473684
2	Kopergaon	Ahmednagar	23.3717277486911	20.8815789473684
3	Nagar	Ahmednagar	22.9211009174312	20.8815789473684
4	Rahta	Ahmednagar	22.007722007722	20.8815789473684
5	Sangamner	Ahmednagar	21.6398891966759	20.8815789473684
6	Shrigonda	Ahmednagar	22.1965317919075	20.8815789473684

Q12: Classify course duration and count per Course Category

```
1 SELECT CourseCategory,  
2     CASE  
3         WHEN CourseDuration < 12 THEN 'Short'  
4         WHEN CourseDuration BETWEEN 12 AND 36 THEN 'Medium'  
5         ELSE 'Long'  
6     END AS DurationType,  
7     COUNT(*) AS CourseCount  
8 FROM college_courses  
9 GROUP BY CourseCategory, DurationType;
```

	CourseCategory	DurationType	CourseCount
1	ARCHITECTURE AND TOWN PLANNING	Long	103
2	ARCHITECTURE AND TOWN PLANNING	Medium	40
3	Agriculture	Long	103
4	Agriculture	Medium	78
5	Arts	Long	100
6	Arts	Medium	16815
7	Commerce	Long	2
8	Commerce	Medium	8621
9	Education	Long	6

Q13: Extract course specialization from CourseName

```
1 SELECT CourseName,  
2         TRIM(SUBSTR(CourseName, INSTR(CourseName, '-') + 1)) AS Specialization  
3 FROM college_courses  
4 WHERE CourseName LIKE '%- %';  
5
```

CourseName		Specialization	
1	Master of Engineering (M. E.) - Computer ...	Computer Science and Engineering	
2	Master of Engineering (M. E.) - Electrical ...	Electrical Power System	
3	Master of Engineering (M. E.) - Thermal ...	Thermal Power Engineering	
4	Bachelor of Engineering (B. E.) - Informatio...	Information Technology	
5	Bachelor of Engineering (B. E.) - Electrical ...	Electrical Engineering	
6	Bachelor of Engineering (B. E.) - ...	Instrumentation Engineering	
7	Master of Engineering (M. E.) - Geo Techni...	Geo Technical Engineering	
8	Master of Engineering (M. E.) - Production ...	Production Engineering	
9	Bachelor of Engineering (B. E.) - Electronic...	Electronics and Telecommunication Engg	
10	Master of Engineering (M. E.) - ...	Environmental Engineering	
11	Master of Engineering (M. E.) - Advanced ...	Advanced Electronics	
12	Master of Engineering (M. E.) - Electrical a...	Electrical and Power Engineering	

Q14: Count how many courses include the word "Engineering"

```
1  SELECT COUNT(*) AS EngineeringCourseCount
2  FROM college_courses
3  WHERE CourseName LIKE '%Engineering%';
4
```

	EngineeringCourseCount
1	5771

Q15: Unique combinations of CourseName, CourseType, and CourseCategory

```
1 SELECT DISTINCT CourseName, CourseType, CourseCategory
2 FROM college_courses;
3
```

	CourseName	CourseType	CourseCategory
1	Master of Engineering (M. E.) - Computer ...	Post Graduate Course	Engineering
2	Master of Engineering (M. E.) - Electrical ...	Post Graduate Course	Engineering
3	Master of Engineering (M. E.) - Thermal ...	Post Graduate Course	Engineering
4	Bachelor of Engineering (B. E.) - Informatio...	Under Graduate Course	Engineering
5	Bachelor of Engineering (B. E.) - Electrical ...	Under Graduate Course	Engineering
6	Bachelor of Engineering (B. E.) - ...	Under Graduate Course	Engineering
7	Master of Engineering (M. E.) - Geo Techni...	Post Graduate Course	Engineering
8	Master of Engineering (M. E.) - Production ...	Post Graduate Course	Engineering
9	Bachelor of Engineering (B. E.) - Electronic...	Under Graduate Course	Engineering
10	Master of Engineering (M. E.) - ...	Post Graduate Course	Engineering
11	Master of Engineering (M. E.) - Advanced ...	Post Graduate Course	Engineering
12	Master of Engineering (M. E.) - Electrical a...	Post Graduate Course	Engineering

Q16: All courses not offered by Government colleges

```
SELECT *
FROM college_courses
WHERE CollegeType <> 'Government';
```

Sr.No	District	Taluka	CollegeName	University	CollegeType	
1	23	Amravati	Amravati	Sant Gadge Baba Amravati ...	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department Master of
2	24	Amravati	Amravati	Sant Gadge Baba Amravati ...	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department Bachelor o
3	25	Amravati	Amravati	Sant Gadge Baba Amravati ...	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department M. B. A.
4	26	Amravati	Amravati	Sant Gadge Baba Amravati ...	SANT GADGE BABA AMRAVATI UNIVERSITY	University Department Master in C
5	31	Amravati	Amravati	Shree Shivaji Education Society's Dr. ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post S.S.C
6	32	Amravati	Amravati	Shree Shivaji Education Society's Dr. ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post S.S.C
7	33	Amravati	Amravati	Shree Shivaji Education Society's Dr. ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post S.S.C
8	34	Amravati	Amravati	Shree Shivaji Education Society's Dr. ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post S.S.C
9	35	Amravati	Amravati	Shree Shivaji Education Society's Dr. ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post S.S.C
10	36	Amravati	Amravati	Shree Shivaji Education Society's Dr. ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post S.S.C
11	89	Akola	Akola	Geetadevi Khandelwal Institute of ...	MAHARASHTRA STATE BOARD OF ...	Government-Aided Post H.S.C

Q17: University with the second-highest number of aided courses

```
1 SELECT University, COUNT(*) AS AidedCourseCount
2 FROM college_courses
3 WHERE Course = 'Aided'
4 GROUP BY University
5 ORDER BY AidedCourseCount DESC
6 LIMIT 1 OFFSET 1;
```

	University	AidedCourseCount
1	NCVT	3445

Q18: Courses with durations above the median

1	WITH Ordered AS (
2	SELECT CourseDuration,
3	ROW_NUMBER() OVER (ORDER BY CourseDuration) AS rn,
4	COUNT(*) OVER () AS total
5	FROM college_courses
6),
7	Median AS (
8	SELECT AVG(CourseDuration) AS MedianDuration
9	FROM (
10	SELECT CourseDuration
11	FROM Ordered
12	WHERE rn IN ((total + 1) / 2, (total + 2) / 2)
13)
14)
15	SELECT *
16	FROM college_courses

	Sr.No	District	Taluka	CollegeName	University	CollegeType	CourseName
1	1	Amravati	Amravati	Government College of Engineering, ...	SANT GADGE BABA AMRAVATI UNIVERSITY	Government	Master of Engineering (M. E.) - Comp
2	2	Amravati	Amravati	Government College of Engineering, ...	SANT GADGE BABA AMRAVATI UNIVERSITY	Government	Master of Engineering (M. E.) - Elect
3	3	Amravati	Amravati	Government College of Engineering, ...	SANT GADGE BABA AMRAVATI UNIVERSITY	Government	Master of Engineering (M. E.) - Therr
4	4	Amravati	Amravati	Government College of Engineering, ...	SANT GADGE BABA AMRAVATI UNIVERSITY	Government	Bachelor of Engineering (B. E.) - Info

Q19: Percentage of unaided courses that are professional, by university

```
1 SELECT University,  
2     ROUND(100.0 * SUM(CASE WHEN IsProfessional = 'Professional Course' THEN 1 ELSE 0 END) /  
3     COUNT(*), 2) AS ProfessionalUnaidedPercentage  
4 FROM college_courses  
5 WHERE Course = 'UnAided'  
6 GROUP BY University;  
7
```

	University	ProfessionalUnaidedPercentage
1	AUTONOMOUS INSTITUTE	94.87
2	AUTONOMUS INSTITUTE OF GOVERNMENT ...	100.0
3	BHARATI VIDYAPEETH UNIVERSITY	76.19
4	CBSE	0.0
5	CENTRAL GOVERNMENT	16.67
6	CIPET, Head Office, Chennai	100.0
7	DATTA MEGHE INSTITUTE OF MEDICAL ...	100.0
8	DEEMED UNIVERSITY	100.0
9	DR. B. A. MARATHWADA UNIVERSITY	26.68
10	DR. B.A.T. UNIVERSITY	100.0

Q20: Top 3 Course Categories with highest average course duration

```
1 SELECT CourseCategory, ROUND(AVG(CourseDuration), 2) AS AvgDuration
2 FROM college_courses
3 GROUP BY CourseCategory
4 ORDER BY AvgDuration DESC
5 LIMIT 3;
6
```

	CourseCategory	AvgDuration
1	ARCHITECTURE AND TOWN PLANNING	49.93
2	Health Science	46.08
3	Agriculture	40.71

Insights Derived

District-Level Trends: Identified districts with the highest concentration of professional courses and diverse educational offerings.

University-Wise Performance: Evaluated which universities support more aided, unaided, or professional courses.

Course Structure Analysis: Explored the variation in course durations and categorized them into short, medium, and long programs.

College Diversity: Found institutions offering both UG and PG programs or multiple course categories.

Operational Gaps: Detected colleges with significant gaps between their shortest and longest courses.

Conclusion

Through this SQL-driven exploration of the CollegeCourses table, I gained practical experience in extracting, transforming, and analyzing structured data using advanced SQL techniques. By formulating and executing 20 queries targeting diverse educational metrics, I was able to uncover meaningful insights into the academic landscape of colleges across districts and universities.



Thank You

