

```

152  -- First Category
153  -- Employee Demographics & Salary Analysis
154  -- 1.1 Calculate and display the total number of employees
155  SELECT COUNT(DISTINCT EmployeeID) AS TotalEmployees
156  FROM Employee;
157
158  -- 1.2 Count unique employees by gender
159  SELECT
160      Gender,
161      COUNT(DISTINCT EmployeeID) AS UniqueEmployeeCount
162  FROM Employee
163  GROUP BY Gender;
164
    
```

Results Messages

	TotalEmployees ▾
1	1470

	Gender ▾	UniqueEmployeeCount ▾
1	Non-Binary	124
2	Prefer Not To Say	20
3	Male	651
4	Female	675

Run Cancel Disconnect Change

Database: HR_Analysis_DataBase

Esti

```
165 -- 1.3 Count unique employees by department
166 SELECT
167     Department,
168     COUNT(DISTINCT EmployeeID) AS UniqueEmployeeCount
169 FROM Employee
170 GROUP BY Department;
171
```

Results Messages

	Department	UniqueEmployeeCount
1	Sales	446
2	Human Resources	63
3	Technology	961

Run Cancel Disconnect Change

Database: HR_Analysis_DataBase

Esti

```
172 -- 1.4 Count unique employees by gender within each department
173 SELECT
174     Department,
175     Gender,
176     COUNT(DISTINCT EmployeeID) AS UniqueEmployeeCount
177 FROM Employee
178 GROUP BY Department, Gender
179 ORDER BY Department, Gender;
180
```

Results Messages

	Department	Gender	UniqueEmployeeCount
1	Human Resources	Female	33
2	Human Resources	Male	24
3	Human Resources	Non-Binary	5
4	Human Resources	Prefer Not To Say	1
5	Sales	Female	204
6	Sales	Male	204
7	Sales	Non-Binary	35
8	Sales	Prefer Not To Say	3
9	Technology	Female	438
10	Technology	Male	423
11	Technology	Non-Binary	84
12	Technology	Prefer Not To Say	16

```

181  -- 1.5 Count unique employees by education level
182  SELECT
183      el.EducationLevel,
184      COUNT(DISTINCT e.EmployeeID) AS UniqueEmployeeCount
185  FROM Employee e
186  JOIN EducationLevel el ON e.Education = el.EducationLevelID
187  GROUP BY el.EducationLevel
188  ORDER BY el.EducationLevel;
189
190  -- 1.6 Count unique employees by job role
191  SELECT
192      JobRole,
193      COUNT(DISTINCT EmployeeID) AS UniqueEmployeeCount
194  FROM Employee
195  GROUP BY JobRole
196  ORDER BY JobRole;
197
    
```

Results

Messages

	EducationLevel ▾	UniqueEmployeeCount ▾
1	Bachelors	572
2	Doctorate	48
3	High School	282
4	Masters	398
5	No Formal Qualifications	170

	JobRole ▾	UniqueEmployeeCount ▾
1	Analytics Manager	52
2	Data Scientist	261
3	Engineering Manager	75
4	HR Business Partner	7
5	HR Executive	28
6	HR Manager	4
7	Machine Learning Engineer	146
8	Manager	37
9	Recruiter	24
10	Sales Executive	327
11	Sales Representative	83
12	Senior Software Engineer	132
13	Software Engineer	294

```

198  -- 2. How does the average salary vary by education level?
199  SELECT el.EducationLevel,
200         AVG(CAST(e.Salary AS DECIMAL(18,2))) AS AverageSalary
201  FROM Employee e
202  JOIN EducationLevel el ON e.Education = el.EducationLevelID
203  GROUP BY el.EducationLevel;
204
205  -- 3. Is there a gender pay gap across different job roles and departments?
206  -- 3. (A) Count the unique number of employees per JobRole
207  SELECT JobRole, COUNT(DISTINCT EmployeeID) AS UniqueEmployeeCount
208  FROM Employee
209  GROUP BY JobRole;
210
211  -- 3. (B) Calculate the average salary based on unique employees per JobRole
212  SELECT e.JobRole,
213         CAST(AVG(CAST(e.Salary AS DECIMAL(18, 6))) AS DECIMAL(18, 6)) AS AverageSalary -- Ensure Salary is treated as decimal
214  FROM (SELECT DISTINCT EmployeeID, JobRole, Salary FROM Employee) e
215  GROUP BY e.JobRole;
216
  
```

Results Messages

	EducationLevel	AverageSalary
1	Bachelors	115405.430069
2	Doctorate	154268.791666
3	High School	105180.535460
4	Masters	117641.057788
5	No Formal Qualifications	94983.482352

	JobRole	UniqueEmployeeCount
1	HR Business Partner	7
2	Machine Learning Engineer	146
3	Recruiter	24
4	Sales Representative	83
5	HR Executive	28
6	Manager	37
7	Analytics Manager	52
8	Sales Executive	327
9	Data Scientist	261
10	Engineering Manager	75
11	Senior Software Engineer	132
12	Software Engineer	294
13	HR Manager	4

	JobRole	AverageSalary
1	HR Business Partner	314002.428571
2	Machine Learning Engineer	130164.616438
3	Recruiter	37647.500000
4	Sales Representative	40656.421686
5	HR Executive	94362.321428
6	Manager	317531.054054
7	Analytics Manager	346484.230769
8	Sales Executive	117195.538226
9	Data Scientist	56079.494252
10	Engineering Manager	286258.506666
11	Senior Software Engineer	126161.295454
12	Software Engineer	51967.051020
13	HR Manager	449330.750000

```

217 -- 4. What is the salary distribution based on years of experience?
218 -- Calculate the promotion rate by JobRole, similar to the Python code
219 SELECT e.JobRole,
220         COUNT(DISTINCT CASE WHEN e.YearsSinceLastPromotion = 0 THEN e.EmployeeID END) AS PromotedEmployeeCount,
221         COUNT(DISTINCT e.EmployeeID) AS TotalEmployeeCount,
222         (COUNT(DISTINCT CASE WHEN e.YearsSinceLastPromotion = 0 THEN e.EmployeeID END) * 100.0 /
223          COUNT(DISTINCT e.EmployeeID)) AS PromotionRate
224 FROM Employee e
225 GROUP BY e.JobRole
226 ORDER BY PromotionRate DESC;
227
228 -- 5 Calculate the average salary by department for unique employees?
229 SELECT e.Department,
230        CAST(AVG(CAST(e.Salary AS DECIMAL(18, 6))) AS DECIMAL(18, 6)) AS AverageSalary
231 FROM Employee e
232 GROUP BY e.Department
233 ORDER BY AverageSalary DESC;
234

```

Results Messages

	JobRole ▼	PromotedEmployeeCount ▼	TotalEmployeeCount ▼	PromotionRate ▼
1	Recruiter	9	24	37.500000000000
2	Sales Representative	29	83	34.939759036144
3	HR Business Partner	2	7	28.571428571428
4	Machine Learning Engineer	33	146	22.602739726027
5	HR Executive	6	28	21.428571428571
6	Sales Executive	69	327	21.100917431192
7	Software Engineer	62	294	21.088435374149
8	Data Scientist	55	261	21.072796934865
9	Senior Software Engineer	17	132	12.878787878787
10	Engineering Manager	9	75	12.000000000000

	Department ▼	AverageSalary ▼
1	Human Resources	119698.809523
2	Sales	119117.609865
3	Technology	109655.122788

```

235  -- Second Category
236  -- Employee Satisfaction & Engagement
237  -- 6. What is the average satisfaction level across different job roles?
238  SELECT e.JobRole,
239         ROUND(AVG(CAST(p.JobSatisfaction AS DECIMAL(10, 2))), 6) AS AverageSatisfaction,
240         CASE
241             WHEN AVG(p.JobSatisfaction) = 1 THEN 'Very Dissatisfied'
242             WHEN AVG(p.JobSatisfaction) = 2 THEN 'Dissatisfied'
243             WHEN AVG(p.JobSatisfaction) = 3 THEN 'Neutral'
244             WHEN AVG(p.JobSatisfaction) = 4 THEN 'Satisfied'
245             WHEN AVG(p.JobSatisfaction) = 5 THEN 'Very Satisfied'
246             ELSE 'Unknown'
247         END AS SatisfactionLevel
248  FROM Employee e
249  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
250  JOIN SatisfiedLevel sl ON p.JobSatisfaction = sl.SatisfactionID
251  GROUP BY e.JobRole;
252

```

Results Messages

	JobRole ▼	AverageSatisfaction ▼	SatisfactionLevel ▼
1	HR Business Partner	3.347826	Neutral
2	Machine Learning Engineer	3.453405	Neutral
3	Recruiter	3.469798	Neutral
4	Sales Representative	3.378323	Neutral
5	HR Executive	3.434782	Neutral
6	Manager	3.435714	Neutral
7	Analytics Manager	3.418269	Neutral
8	Sales Executive	3.435897	Neutral
9	Data Scientist	3.457352	Neutral
10	Engineering Manager	3.526490	Neutral
11	Senior Software Engineer	3.356275	Neutral
12	Software Engineer	3.413043	Neutral
13	HR Manager	3.250000	Neutral

```

253  -- 7 Calculate average salary by satisfaction level for unique employees
254  WITH UniqueEmployees AS (
255      SELECT E.EmployeeID,
256             (SELECT TOP 1 PR.JobSatisfaction
257              FROM PerformanceRating PR
258              WHERE PR.EmployeeID = E.EmployeeID
259              ORDER BY PR.EmployeeID) AS JobSatisfaction,
260             (SELECT TOP 1 E2.Salary
261              FROM Employee E2
262              WHERE E2.EmployeeID = E.EmployeeID
263              ORDER BY E2.EmployeeID) AS Salary
264      FROM Employee E
265      GROUP BY E.EmployeeID
266  )
267  SELECT JobSatisfaction, AVG(Salary * 1.0) AS AverageSalary
268  FROM UniqueEmployees
269  WHERE JobSatisfaction IS NOT NULL
270  GROUP BY JobSatisfaction
271  ORDER BY JobSatisfaction;
272
273  -- 8. Do employees with higher education levels report higher satisfaction?
274  SELECT el.EducationLevel,
275         ROUND(AVG(CAST(p.JobSatisfaction AS DECIMAL(10, 2))), 6) AS AverageSatisfaction
276  FROM Employee e
277  JOIN EducationLevel el ON e.Education = el.EducationLevelID
278  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
279  GROUP BY el.EducationLevel;
280

```

Results **Messages**

	JobSatisfaction ▾	AverageSalary ▾
1	1	120500.333333
2	2	116695.341463
3	3	104914.106312
4	4	113217.044444
5	5	120707.823717

	EducationLevel ▾	AverageSatisfaction ▾
1	High School	3.460399
2	Doctorate	3.298578
3	No Formal Qualifications	3.377380
4	Bachelors	3.440015
5	Masters	3.435146


```

281  -- 9. Which departments have the most satisfied and least satisfied employees?
282  SELECT e.Department,
283         ROUND(AVG(CAST(p.JobSatisfaction AS DECIMAL(10, 2))), 6) AS AverageSatisfaction
284  FROM Employee e
285  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
286  GROUP BY e.Department;
287
288  -- 10. Does job role impact satisfaction level?
289  SELECT e.JobRole,
290         ROUND(AVG(CAST(p.JobSatisfaction AS DECIMAL(10, 2))), 6) AS AverageSatisfaction,
291         CASE
292             WHEN AVG(p.JobSatisfaction) = 1 THEN 'Very Dissatisfied'
293             WHEN AVG(p.JobSatisfaction) = 2 THEN 'Dissatisfied'
294             WHEN AVG(p.JobSatisfaction) = 3 THEN 'Neutral'
295             WHEN AVG(p.JobSatisfaction) = 4 THEN 'Satisfied'
296             WHEN AVG(p.JobSatisfaction) = 5 THEN 'Very Satisfied'
297             ELSE NULL
298         END AS AverageSatisfaction
299  FROM Employee e
300  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
301  JOIN SatisfiedLevel sl ON p.JobSatisfaction = sl.SatisfactionID
302  GROUP BY e.JobRole;
303

```

Results
Messages

	Department	AverageSatisfaction
1	Sales	3.422056
2	Human Resources	3.435643
3	Technology	3.434578

	JobRole	AverageSatisfaction	AverageSatisfaction
1	HR Business Partner	3.347826	Neutral
2	Machine Learning Engineer	3.453405	Neutral
3	Recruiter	3.469798	Neutral
4	Sales Representative	3.378323	Neutral
5	HR Executive	3.434782	Neutral
6	Manager	3.435714	Neutral
7	Analytics Manager	3.418269	Neutral
8	Sales Executive	3.435897	Neutral
9	Data Scientist	3.457352	Neutral
10	Engineering Manager	3.526490	Neutral
11	Senior Software Engineer	3.356275	Neutral
12	Software Engineer	3.413043	Neutral
13	HR Manager	3.250000	Neutral


```

304 -- Third Category
305 -- Attrition & Turnover Analysis
306 -- 11. What is the overall employee attrition rate?
307 SELECT
308     e.Attrition,
309     ROUND(COUNT(*) * 100.0 / (SELECT COUNT(*) FROM Employee), 6) AS AttritionRate
310 FROM Employee e
311 GROUP BY e.Attrition
312 ORDER BY Attrition DESC;
313
314 -- 12. Which department has the highest employee turnover?
315 SELECT
316     e.Department,
317     COUNT(*) AS TotalEmployees, -- Count total employees in each department
318     SUM(CASE WHEN e.Attrition = 'Yes' THEN 1 ELSE 0 END) AS AttritionEmployees, -- Count employees who left
319     (SUM(CASE WHEN e.Attrition = 'Yes' THEN 1 ELSE 0 END) * 100.0) / COUNT(*) AS AttritionRate -- Calculate attrition rate as a percentage
320 FROM Employee e
321 GROUP BY e.Department
322 ORDER BY AttritionRate DESC; -- Sort departments by highest attrition rate
323
    
```

Results Messages

	Attrition	AttritionRate
1	Yes	16.122449000000
2	No	83.877551000000

	Department	TotalEmployees	AttritionEmployees	AttritionRate
1	Sales	446	92	20.627802690582
2	Human Resources	63	12	19.047619047619
3	Technology	961	133	13.839750260145

```

324 -- 13. Is there a connection between satisfaction level and attrition?
325 SELECT sl.SatisfactionLevel,
326        COUNT(*) AS TotalEmployees,
327        SUM(CASE WHEN e.Attrition = 'Yes' THEN 1 ELSE 0 END) AS AttritionEmployees,
328        (SUM(CASE WHEN e.Attrition = 'Yes' THEN 1 ELSE 0 END) * 100.0) / COUNT(*) AS AttritionRate
329 FROM PerformanceRating p
330 JOIN SatisfiedLevel sl ON p.EnvironmentSatisfaction = sl.SatisfactionID
331 JOIN Employee e ON p.EmployeeID = e.EmployeeID
332 GROUP BY sl.SatisfactionLevel
333 ORDER BY AttritionRate DESC;
334
335 -- 13. Is there a connection between satisfaction level and attrition?
336 WITH LatestPerformance AS (
337     SELECT
338         EmployeeID,
339         EnvironmentSatisfaction,
340         ROW_NUMBER() OVER (PARTITION BY EmployeeID ORDER BY ReviewDate DESC) AS rn
341     FROM PerformanceRating
342 )
343 SELECT
344     sl.SatisfactionLevel,
345     COUNT(DISTINCT e.EmployeeID) AS TotalEmployees,
346     COUNT(DISTINCT CASE WHEN e.Attrition = 'Yes' THEN e.EmployeeID END) AS AttritionEmployees,
347     (COUNT(DISTINCT CASE WHEN e.Attrition = 'Yes' THEN e.EmployeeID END) * 100.0) / COUNT(DISTINCT e.EmployeeID) AS AttritionRate
348 FROM Employee e
349 JOIN LatestPerformance lp ON e.EmployeeID = lp.EmployeeID AND lp.rn = 1
350 JOIN SatisfiedLevel sl ON lp.EnvironmentSatisfaction = sl.SatisfactionID
351 GROUP BY sl.SatisfactionLevel
352 ORDER BY AttritionRate DESC;
353
    
```

Results Messages

	SatisfactionLevel	TotalEmployees	AttritionEmployees	AttritionRate
1	Neutral	2211	776	35.097241067390
2	Very Satisfied	2046	700	34.213098729227
3	Satisfied	2175	706	32.459770114942
4	Dissatisfied	141	44	31.205673758865
5	Very Dissatisfied	136	35	25.735294117647

	SatisfactionLevel	TotalEmployees	AttritionEmployees	AttritionRate
1	Dissatisfied	62	16	25.806451612903
2	Very Dissatisfied	51	11	21.568627450980
3	Very Satisfied	343	66	19.241982507288
4	Neutral	431	82	19.025522041763
5	Satisfied	393	62	15.776081424936

```

354 -- 14. Do employees with higher education levels have lower attrition rates?
355 SELECT el.EducationLevel,
356        COUNT(*) AS TotalEmployees,
357        SUM(CASE WHEN e.Attrition = 'Yes' THEN 1 ELSE 0 END) AS AttritionEmployees,
358        (SUM(CASE WHEN e.Attrition = 'Yes' THEN 1 ELSE 0 END) * 100.0) / COUNT(*) AS AttritionRate
359 FROM Employee e
360 LEFT JOIN EducationLevel el ON e.Education = el.EducationLevelID
361 GROUP BY el.EducationLevel
362 ORDER BY AttritionRate ASC;
363
364 -- 15. How does tenure (years at company) impact attrition?
365 WITH EmployeeTenure AS (
366     SELECT
367         e.EmployeeID,
368         e.YearsAtCompany, -- Use the original YearsAtCompany value instead of recalculating it
369         e.Attrition,
370         ROW_NUMBER() OVER (PARTITION BY e.EmployeeID ORDER BY e.HireDate ASC) AS rn
371     FROM Employee e
372 )
373 -- Step 2: Calculate attrition rate based on unique employees
374 SELECT
375     YearsAtCompany,
376     COUNT(EmployeeID) AS TotalEmployees, -- Count total unique employees per tenure
377     SUM(CASE WHEN Attrition = 'Yes' THEN 1 ELSE 0 END) AS AttritionEmployees, -- Count employees who left
378     (SUM(CASE WHEN Attrition = 'Yes' THEN 1 ELSE 0 END) * 100.0) / COUNT(EmployeeID) AS AttritionRate -- Calculate attrition rate (%)
379 FROM EmployeeTenure
380 WHERE rn = 1 -- Select only the first record for each employee
381 GROUP BY YearsAtCompany
382 ORDER BY YearsAtCompany ASC;
383

```

Results Messages

	EducationLevel	TotalEmployees	AttritionEmployees	AttritionRate
1	Doctorate	48	5	10.416666666666666
2	Masters	398	58	14.572864321608
3	High School	282	44	15.602836879432
4	Bachelors	572	99	17.307692307692
5	No Formal Qualifications	170	31	18.235294117647

	YearsAtCompany	TotalEmployees	AttritionEmployees	AttritionRate
1	0	190	60	31.578947368421
2	1	177	61	34.463276836158
3	2	124	25	20.161290322580
4	3	148	24	16.216216216216
5	4	129	15	11.627906976744
6	5	115	20	17.391304347826
7	6	101	11	10.891089108910
8	7	121	9	7.438016528925
9	8	119	6	5.042016806722
10	9	118	5	4.237288135593
11	10	128	1	0.781250000000

```

384  -- Fourth Category
385  -- Promotion & Career Growth
386  -- 16. How long does it take, on average, for employees to receive a promotion?
387  SELECT
388      CAST(AVG(CAST(e.YearsSinceLastPromotion AS DECIMAL(18, 6))) AS DECIMAL(18, 6)) AS AveragePromotionTime
389  FROM Employee e;
390
391  -- 17. Is there a correlation between education level and promotion frequency?
392  SELECT
393      el.EducationLevel,
394      AVG(CAST(e.YearsSinceLastPromotion AS FLOAT)) AS AvgYearsSinceLastPromotion -- Calculate the average time to promotion
395  FROM Employee e
396  LEFT JOIN EducationLevel el ON e.Education = el.EducationLevelID
397  GROUP BY el.EducationLevel
398  ORDER BY AvgYearsSinceLastPromotion ASC;
399
400  -- 18. Which departments promote employees the fastest and the slowest?
401  SELECT e.Department,
402      CAST(AVG(CAST(e.YearsSinceLastPromotion AS DECIMAL(18, 6))) AS DECIMAL(18, 6)) AS AveragePromotionTime
403  FROM Employee e
404  GROUP BY e.Department
405  ORDER BY AveragePromotionTime ASC; -- Fastest promotion first
406
  
```

Results Messages

	AveragePromotionTime
1	3.440816

	EducationLevel	AvgYearsSinceLastPromotion
1	Masters	3.1231155778894473
2	Bachelors	3.3933566433566433
3	No Formal Qualifications	3.5823529411764707
4	Doctorate	3.6875
5	High School	3.858156028368794

	Department	AveragePromotionTime
1	Sales	3.260089
2	Human Resources	3.285714
3	Technology	3.534859

```

407  -- 19. What percentage of satisfied employees receive promotions?
408  -- 19.1. Select the first job satisfaction rating for each employee
409  WITH FirstSatisfaction AS (
410      SELECT
411          e.EmployeeID,
412          pr.JobSatisfaction,
413          e.YearsSinceLastPromotion,
414          ROW_NUMBER() OVER (PARTITION BY e.EmployeeID ORDER BY e.YearsSinceLastPromotion ASC) AS row_num
415      FROM Employee e
416      JOIN PerformanceRating pr ON e.EmployeeID = pr.EmployeeID
417  )
418  -- 19.2. Calculate the total number of employees and the number of promoted employees by job satisfaction level
419  , PromotionStats AS (
420      SELECT
421          JobSatisfaction,
422          COUNT(DISTINCT EmployeeID) AS TotalEmployees, -- Ensure each employee is counted only once
423          COUNT(DISTINCT CASE WHEN YearsSinceLastPromotion = 0 THEN EmployeeID END) AS PromotedEmployees
424      FROM FirstSatisfaction
425      WHERE row_num = 1 -- Select only the first record per employee
426      GROUP BY JobSatisfaction
427  )
428  -- 19.3. Compute the promotion percentage by job satisfaction level
429  SELECT
430      JobSatisfaction,
431      TotalEmployees,
432      PromotedEmployees,
433      (PromotedEmployees * 100.0) / NULLIF(TotalEmployees, 0) AS PromotionPercentage
434  FROM PromotionStats
435  ORDER BY JobSatisfaction;
436

```

Results Messages

	JobSatisfaction	TotalEmployees	PromotedEmployees	PromotionPercentage
1	1	40	6	15.000000000000
2	2	332	33	9.939759036144
3	3	335	48	14.328358208955
4	4	302	37	12.251655629139
5	5	271	35	12.915129151291

```

437  -- 20. Does gender impact promotion opportunities?
438  WITH UniqueEmployees AS (
439      SELECT
440          e.EmployeeID,
441          e.Gender,
442          e.YearsSinceLastPromotion
443      FROM Employee e
444      -- Ensure each employee appears only once based on first promotion date
445      WHERE e.YearsSinceLastPromotion = (
446          SELECT MIN(e2.YearsSinceLastPromotion)
447          FROM Employee e2
448          WHERE e2.EmployeeID = e.EmployeeID
449      )
450  )
451  SELECT
452      Gender,
453      COUNT(CASE WHEN YearsSinceLastPromotion = 0 THEN 1 END) AS PromotionFrequency,
454      COUNT(*) AS TotalEmployees,
455      (COUNT(CASE WHEN YearsSinceLastPromotion = 0 THEN 1 END) * 100.0) / COUNT(*) AS PromotionRate
456  FROM UniqueEmployees
457  GROUP BY Gender
458  ORDER BY PromotionRate DESC;
459
    
```

Results Messages

	Gender	PromotionFrequency	TotalEmployees	PromotionRate
1	Prefer Not To Say	6	20	30.000000000000
2	Male	139	651	21.351766513056
3	Female	133	675	19.703703703703
4	Non-Binary	23	124	18.548387096774

```

460 ----- Additional Questions -----
461 -----
462 -- 21. Calculate the total salary of all employees
463 SELECT SUM(Salary) AS total_salary
464 FROM (
465     SELECT DISTINCT EmployeeID, Salary
466     FROM Employee
467 ) AS unique_salaries;
468
469 -- 22. Calculate total salary distribution by department
470 SELECT Department, SUM(Salary) AS total_salary
471 FROM (
472     -- Select distinct EmployeeID and Salary to avoid duplicate salary calculations
473     SELECT DISTINCT EmployeeID, Department, Salary
474     FROM Employee
475 ) AS unique_salaries
476 GROUP BY Department;
477
478 -- 23. Calculate the number of employees hired in each year
479 SELECT
480     YEAR(HireDate) AS Year,
481     COUNT(DISTINCT EmployeeID) AS EmployeeCount
482 FROM Employee
483 GROUP BY YEAR(HireDate)
484 ORDER BY Year;
485

```

Results Messages

	total_salary
1	166046052

	Department	total_salary
1	Sales	53126454
2	Human Resources	7541025
3	Technology	105378573

	Year	EmployeeCount
1	2012	151
2	2013	136
3	2014	136
4	2015	127
5	2016	114
6	2017	106
7	2018	136
8	2019	145
9	2020	127
10	2021	137
11	2022	155


```

486  -- 24. Calculate the Number of Employees based on BusinessTravel and Attrition
487  SELECT
488      BusinessTravel,
489      Attrition,
490      COUNT(DISTINCT EmployeeID) AS EmployeeCount
491  FROM Employee
492  GROUP BY BusinessTravel, Attrition
493  ORDER BY BusinessTravel, Attrition;
494
495  -- 25. Calculate the Number of Employees based on OverTime and Attrition
496  -- Count unique employees based on OverTime and Attrition
497  SELECT
498      OverTime,
499      Attrition,
500      COUNT(DISTINCT EmployeeID) AS EmployeeCount
501  FROM Employee
502  GROUP BY OverTime, Attrition
503  ORDER BY OverTime, Attrition;
504
    
```

Results Messages

	BusinessTravel ▾	Attrition ▾	EmployeeCount ▾
1	Frequent Traveller	No	208
2	Frequent Traveller	Yes	69
3	No Travel	No	138
4	No Travel	Yes	12
5	Some Travel	No	887
6	Some Travel	Yes	156

	OverTime ▾	Attrition ▾	EmployeeCount ▾
1	No	No	944
2	No	Yes	110
3	Yes	No	289
4	Yes	Yes	127

```

505  -- 26.1 Define the age ranges of Employees
506  WITH AgeRanges AS (
507      SELECT
508          EmployeeID,
509          CASE
510              WHEN Age >= 20 AND Age < 30 THEN '20-30'
511              WHEN Age >= 30 AND Age < 40 THEN '30-40'
512              WHEN Age >= 40 AND Age < 50 THEN '40-50'
513              WHEN Age >= 50 AND Age < 60 THEN '50-60'
514              WHEN Age >= 60 AND Age < 70 THEN '60-70'
515              ELSE 'Other'
516          END AS AgeRange
517      FROM Employee
518      WHERE Age IS NOT NULL -- Exclude employees with missing age
519  )
520
521  -- Count employees in each age range
522  , AgeRangeCount AS (
523      SELECT AgeRange, COUNT(DISTINCT EmployeeID) AS EmployeeCount
524      FROM AgeRanges
525      GROUP BY AgeRange
526  )
527
528  -- Display age range counts
529  SELECT * FROM AgeRangeCount
530  ORDER BY EmployeeCount DESC;
531
532  -- 26.2 Find the minimum and maximum age of employees (no duplicates)
533  SELECT
534      MIN(Age) AS MinAge,
535      MAX(Age) AS MaxAge
536  FROM Employee
537  WHERE Age IS NOT NULL;

```

Results Messages

	AgeRange	EmployeeCount
1	20-30	874
2	30-40	289
3	40-50	219
4	Other	81
5	50-60	7

	MinAge	MaxAge
1	18	51

```

539  -- 27. Calculate the correlation between ManagerRating and JobSatisfaction
540  WITH PerformanceManagerRating AS (
541      -- Merge all necessary tables (Employee, PerformanceRating, EducationLevel, SatisfiedLevel, RatingLevel)
542      SELECT
543          e.EmployeeID,
544          p.ManagerRating,
545          p.JobSatisfaction
546      FROM Employee e
547      JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
548      JOIN EducationLevel el ON e.Education = el.EducationLevelID
549      JOIN SatisfiedLevel sl ON p.EnvironmentSatisfaction = sl.SatisfactionID
550      JOIN RatingLevel rl ON p.ManagerRating = rl.RatingID
551      WHERE p.ManagerRating IS NOT NULL AND p.JobSatisfaction IS NOT NULL
552  )
553
554  -- Calculate the mean of JobSatisfaction for each ManagerRating
555  SELECT
556      ManagerRating,
557      AVG(JobSatisfaction) AS AverageJobSatisfaction
558  FROM PerformanceManagerRating
559  GROUP BY ManagerRating
560  ORDER BY ManagerRating;
561

```

Results Messages

	ManagerRating ▾	AverageJobSatisfaction ▾
1	2	3
2	3	3
3	4	3
4	5	3


```

562 -- 28. Count employees hired per year and Count employees who left (attrition) by each department
563 WITH HireCounts AS (
564     SELECT
565         YEAR(HireDate) AS Year,
566         Department,
567         COUNT(DISTINCT EmployeeID) AS EmployeesHired
568     FROM Employee
569     GROUP BY YEAR(HireDate), Department
570 ),
571 AttritionCounts AS (
572     SELECT
573         YEAR(HireDate) AS Year,
574         Department,
575         COUNT(DISTINCT EmployeeID) AS EmployeesLeft
576     FROM Employee
577     WHERE Attrition = 'Yes'
578     GROUP BY YEAR(HireDate), Department
579 )
580 SELECT
581     COALESCE(h.Year, a.Year) AS Year,
582     COALESCE(h.Department, a.Department) AS Department,
583     COALESCE(h.EmployeesHired, 0) AS EmployeesHired,
584     COALESCE(a.EmployeesLeft, 0) AS EmployeesLeft
585 FROM HireCounts h
586 FULL OUTER JOIN AttritionCounts a
587 ON h.Year = a.Year AND h.Department = a.Department
588 ORDER BY Year, Department;
589

```

Results Messages

	Year	Department	EmployeesHired	EmployeesLeft
1	2012	Human Resources	12	3
2	2012	Sales	49	9
3	2012	Technology	90	12
4	2013	Human Resources	4	0
5	2013	Sales	39	12
6	2013	Technology	93	11
7	2014	Human Resources	4	2
8	2014	Sales	49	8
9	2014	Technology	83	13
10	2015	Human Resources	5	1
11	2015	Sales	34	7
12	2015	Technology	88	7
13	2016	Human Resources	2	0
14	2016	Sales	35	8
15	2016	Technology	77	16
16	2017	Human Resources	7	1
17	2017	Sales	23	3
18	2017	Technology	76	7
19	2018	Human Resources	5	1
20	2018	Sales	43	11
21	2018	Technology	88	10
22	2019	Human Resources	3	0
23	2019	Sales	41	5
24	2019	Technology	101	16
25	2020	Human Resources	6	1
26	2020	Sales	41	13
27	2020	Technology	80	14
28	2021	Human Resources	6	1
29	2021	Sales	44	8
30	2021	Technology	87	12
31	2022	Human Resources	9	2
32	2022	Sales	48	8
33	2022	Technology	98	15

```

590  -- 29. What is the most common reason for employee turnover?
591  -- JobRole
592  SELECT TOP 1 JobRole, COUNT(DISTINCT e.EmployeeID) AS Count
593  FROM Employee e
594  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
595  WHERE e.Attrition = 'Yes'
596  GROUP BY JobRole
597  ORDER BY Count DESC;
598
599  -- BusinessTravel
600  SELECT TOP 1 BusinessTravel, COUNT(DISTINCT e.EmployeeID) AS Count
601  FROM Employee e
602  WHERE e.Attrition = 'Yes'
603  GROUP BY BusinessTravel
604  ORDER BY Count DESC;
605
606  -- OverTime
607  SELECT TOP 1 OverTime, COUNT(DISTINCT e.EmployeeID) AS Count
608  FROM Employee e
609  WHERE e.Attrition = 'Yes'
610  GROUP BY OverTime
611  ORDER BY Count DESC;
612
613  -- JobSatisfaction
614  SELECT TOP 1 CAST(JobSatisfaction AS DECIMAL(3,2)) AS JobSatisfaction, COUNT(DISTINCT e.EmployeeID) AS Count
615  FROM Employee e
616  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
617  WHERE e.Attrition = 'Yes'
618  GROUP BY JobSatisfaction
619  ORDER BY Count DESC;
620
621  -- ManagerRating
622  SELECT TOP 1 CAST(ManagerRating AS DECIMAL(3,2)) AS ManagerRating, COUNT(DISTINCT e.EmployeeID) AS Count
623  FROM Employee e
624  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
625  WHERE e.Attrition = 'Yes'
626  GROUP BY ManagerRating
627  ORDER BY Count DESC;
628
629  -- WorkLifeBalance
630  SELECT TOP 1 CAST(WorkLifeBalance AS DECIMAL(3,2)) AS WorkLifeBalance, COUNT(DISTINCT e.EmployeeID) AS Count
631  FROM Employee e
632  JOIN PerformanceRating p ON e.EmployeeID = p.EmployeeID
633  WHERE e.Attrition = 'Yes'
634  GROUP BY WorkLifeBalance
635  ORDER BY Count DESC;
636

```

Results
Messages

	JobRole	Count
1	Data Scientist	62

	BusinessTravel	Count
1	Some Travel	156

	OverTime	Count
1	Yes	127

	JobSatisfaction	Count
1	5.00	224

	ManagerRating	Count
1	3.00	235

	WorkLifeBalance	Count
1	4.00	228