---------- SQL PROJECT ----------

THE RISE OF AI- TECHNOLOGIES

--------- Easy Level --------

1) Find all industries with adoption rates greater than 0.75

```
SELECT industry_name, adoption_rate
FROM Industry
WHERE adoption_rate > 0.75;
```

	industry_name	adoption_rate
1	Healthcare	75
2	Tech	0.85
3	Retail	60
4	Manufacturing	65
5	Real Estate	70
6	Education	55
7	Real Estate	77.5
8	Government	50
9	Real Estate	68
10	Insurance	72
11	Real Estate	63
12	Agriculture	58
13	Logistics	80
14	Aerospace	62
15	Hospitality	64

Insight :- The query helps highlight industries that are leading in AI adoption, potentially indicating sectors where AI integration is significantly advanced.

2)Find top 10 companys with highest AI Investment in desc order

```
SELECT TOP 10 COMPANY_NAME, AI_INVESTMENT FROM COMPANY
ORDER BY AI_INVESTMENT DESC ;
```

	COMPANY_NAME	AI_INVESTMENT
1	Nvidia	700000000.00
2	Siemens	600000000.00
3	Tesla	500000000.00
4	Samsung	400000000.00
5	Intel	350000000.00
6	Google	300000000.00
7	Amazon	250000000.00
8	Alibaba	250000000.00
9	Facebook	200000000.00
10	Microsoft	200000000.00

Insight :- The results are sorted in descending order of investment, showcasing the leading organizations prioritizing AI initiatives.

3)Get all companys that have made an Ai_investment greter than million(10,000,000) in desc order.

```
SELECT COMPANY_NAME, AI_INVESTMENT
FROM COMPANY WHERE AI_INVESTMENT >10000000 ORDER BY AI_INVESTMENT DESC ;
```

Insight :- The results are sorted in descending order of investment, emphasizing companies with significant financial commitments to AI initiatives.

	COMPANY_NAME	AI_INVESTMENT
1	Nvidia	700000000.00
2	Siemens	600000000.00
3	Tesla	500000000.00
4	Samsung	400000000.00
5	Intel	350000000.00
6	Google	300000000.00
7	Alibaba	250000000.00
8	Amazon	250000000.00
9	Facebook	200000000.00
10	Microsoft	200000000.00
11	Uber	200000000.00
12	Baidu	180000000.00
13	Apple	150000000.00
14	Walmart	120000000.00
15	Spotify	100000000.00

4) List all companies and their associated industries .

```
SELECT c.company_name, i.industry_name
FROM Company c
INNER JOIN Industry i ON c.industry_id = i.industry_id;
```

	company_name	industry_name
1	Apple	Real Estate
2	Microsoft	Real Estate
3	Google	Real Estate
4	Tesla	Real Estate
5	Amazon	Retail
6	Baidu	Real Estate
7	IBM	Education
8	Nvidia	Manufacturing
9	Facebook	Real Estate
10	Intel	Manufacturing

Insight:- The industries they belong to by joining the **Company** and **Industry** tables. It provides a clear mapping of companies to their respective sectors, giving insights into industry-specific company distributions.

5) Retrieve all training programs by a specific company (Table: AI_Training_Programs)

```
SELECT program_name
FROM AI_Training_Programs
WHERE company_id = 3;
```

	program_name
1	Deep Learning Fundamentals

Insight:-

This query lists the training programs associated with the company whose company_id is 3. It provides insight into the specific AI initiatives or educational efforts undertaken by that company.

---------- Medium Level Query ----------

6) Count the total number of companies in each industry

```
SELECT i.industry_name, COUNT(c.company_id) AS Total_Companies
FROM Industry i
LEFT JOIN Company c ON i.industry_id = c.industry_id
GROUP BY i.industry_name;
```

	industry_name	Total_Companies
1	Aerospace	0
2	Agriculture	0
3	Construction	0
4	Education	2
5	Government	0
6	Healthcare	0
7	Hospitality	0
8	Insurance	0
9	Logistics	0
10	Manufacturing	4
11	Media & Entertainment	0
12	Pharmaceuticals	0
13	Real Estate	7
14	Retail	5
15	Tech	0

Insight:- This query calculates the number of companies in each industry, including industries without any companies (due to the LEFT JOIN). It offers insights into industry representation and identifies industries with low or no company presence.

7) Find the average AI investment by industry (Table: Industry).

```
SELECT industry_name, AVG(ai_investment) AS Avg_Investment
FROM Industry
GROUP BY industry_name;
```

Insight:-

This query calculates the average AI investment for each industry by grouping the data by **industry_name**. It provides insights into how much different industries, on average, are investing in AI initiatives.

	industry_name	Avg_Investment
1	Aerospace	32000000.000000
2	Agriculture	22000000.000000
3	Construction	30000000.000000
4	Education	15000000.000000
5	Government	20000000.000000
6	Healthcare	50000000.000000
7	Hospitality	27000000.000000
8	Insurance	45000000.000000
9	Logistics	80000000.000000
10	Manufacturing	40000000.000000
11	Media & Entertainment	55000000.000000
12	Pharmaceuticals	120000000.000000
13	Real Estate	48750000.000000
14	Retail	30000000.000000
15	Tech	100000000.000000

8) List training programs and the technologies they focus on (Tables: AI_Training_Programs, AI_Technologies)

```
 SELECT t.program_name, tech.technology_name
FROM AI_Training_Programs t
INNER JOIN AI_Technologies tech ON t.technology_focus = tech.technology_name;
```

	program_name	technology_name
1	AI Basics for Business	Machine Learning
2	Advanced NLP Techniques	Natural Language Processing
3	Vision Systems for Robotics	Computer Vision
4	Deep Learning Fundamentals	Deep Learning
5	Robotics and Automation	Robotics
6	Introduction to AI	Machine Learning
7	Computer Vision for Healthcare	Computer Vision
8	AI and Machine Learning Applications	Machine Learning

Insight:-

This query calculates the average AI investment for each industry by grouping the data by industry_name. It provides insights into how much different industries, on average, are investing in AI initiatives.

9) Find Impact of Ai_techology across all companys

```
SELECT C.COMPANY_NAME ,AI.IMPACT_AREA,AI. RESULT
FROM AI_IMPACT AS AI
JOIN COMPANY AS C ON AI.COMPANY_ID = C.COMPANY_ID ;
```

	COMPANY_NAME	IMPACT_AREA	RESULT
3	Google	Search Optimization	Utilized AI to enhance search engine algorithms, improvi...
4	Tesla	Autonomous Driving	Significant advancements in self-driving car technology, r...
5	Amazon	Supply Chain Optimization	AI-driven automation in supply chains, reducing costs an...
6	Baidu	Natural Language Processing	Improved communication between humans and machin...
7	IBM	AI-driven Healthcare	Leveraging AI to assist in medical diagnosis, drug discov...
8	Nvidia	AI Hardware Development	Leading the development of AI hardware, accelerating th...
9	Facebook	Social Media Personalization	AI-driven algorithms enhance user experience by person...
10	Intel	AI in Semiconductor Industry	AI optimization of semiconductor production, improving e...
11	Adobe	Creative Suite Enhancement	Using AI to enhance image and video editing tools, maki...
12	Spotify	Music Recommendation Engine	AI-driven recommendation engine personalizes music su...
13	Uber	Ride-sharing Optimization	AI optimizes route planning and ride-sharing logistics, re...
14	Alibaba	E-commerce Automation	AI algorithms for personalized shopping experiences and...
15	Samsung	Smart Devices	AI integration into smart devices such as phones, TVs, an...
16	Salesforce	Customer Relationship Management	AI-powered CRM tools to predict customer behavior and i...
17	Siemens	Industry 4.0	AI-driven automation in manufacturing processes, enhan...
18	Walmart	Retail Optimization	AI-powered tools optimize inventory management, pricin...

Insight:-

This query calculates the average AI investment across companies in each industry by grouping data based on industry_name. It helps in understanding which industries are making significant average investments in AI compared to others.

10) Find the number of patents filed per company (Tables: AI_Patents,Company).

```
SELECT c.company_name, COUNT(p.patent_id) AS Total_Patents
FROM Company c
LEFT JOIN AI_Patents p ON c.company_id = p.company_id
GROUP BY c.company_name;
```

Insight:-

This query calculates the total number of patents filed by each company by performing a **LEFT JOIN** between the **Company** and **AI_Patents** tables. It provides insights into companies' innovation levels by showing the number of patents associated with each company, including those without any patents.

	company_name	Total_Patents
1	Adobe	0
2	Alibaba	0
3	Amazon	0
4	Apple	0
5	Baidu	0
6	Facebook	0
7	Google	0
8	IBM	0
9	Intel	0
10	Microsoft	0
11	Nvidia	0
12	Salesforce	0
13	Samsung	0
14	Siemens	0
15	Spotify	0

---------- Advance Level Query ----------

11) Find the companies that have the highest AI investment in their respective industries.

```
 SELECT i.industry_name, c.company_name, c.ai_investment
FROM Company c
INNER JOIN Industry i ON c.industry_id = i.industry_id
WHERE c.ai_investment = (
    SELECT MAX(c2.ai_investment)
    FROM Company c2
    WHERE c2.industry_id = c.industry_id
)
ORDER BY c.ai_investment DESC;
```

	industry_name	company_name	ai_investment
1	Manufacturing	Nvidia	700000000.00
2	Real Estate	Tesla	500000000.00
3	Real Estate	Google	300000000.00
4	Retail	Amazon	250000000.00
5	Retail	Alibaba	250000000.00
6	Education	Salesforce	90000000.00

Insight:-

This query retrieves the **industry name**, **company name**, and the **highest AI investment** made by a company in each industry. It uses a correlated subquery to find the maximum AI investment for each industry and filters companies based on this value.

12) Find the Top 3 Companies with the Most Patents Related to AI technologies

```
SELECT
    c.company_name,
    COUNT(p.patent_id) AS Total_Patents
FROM
    Company c
INNER JOIN
    AI_Patent p ON c.company_id = p.company_id
GROUP BY
    c.company_name
ORDER BY
    Total_Patents DESC
OFFSET 0 ROWS FETCH NEXT 3 ROWS ONLY;
```

	company_name	Total_Patents
1	Apple	1
2	Amazon	1
3	Alibaba	1

Insight:-

The Company and AI_Patent tables. It counts the patents for each company and sorts them in descending order, ensuring that only the top 3 companies are shown. This helps identify the leading innovators based on their patent filings.

13) Count the number of company in each industry with a minimum AI investment >= 50,000

```
        SELECT
    a.technology_name,
    COUNT(DISTINCT c.company_id) AS Total_Companies
FROM
    AI_Technologies a
INNER JOIN
    Company c ON c.ai_use_case = a.tech_id
GROUP BY
    a.technology_name
ORDER BY
    Total_Companies DESC;
```

	industry_name	company_count
1	Real Estate	7
2	Retail	5
3	Manufacturing	4
4	Education	2

Insight:-

This query calculates the number of companies in each industry where AI investment is **greater than or equal to 500,000**. It groups the data by industry name and orders the industries by the count of companies in descending order.

14) Calculate the Average Duration of Training Programs by Region

```
SELECT
   ind.industry_name,
   COUNT(co.company_id) AS company_count
FROM
   Company AS co
JOIN
    Industry AS ind
WHERE
    co.ai_investment >= 500000
GROUP BY
     ind.industry_name
ORDER BY
     company_count DESC;
```

	technology_name	Total_Companies
1	Machine Learning	3
2	Computer Vision	2
3	Deep Learning	2
4	Expert Systems	2
5	Robotics	2
6	Speech Recognition	1
7	Chatbots	1
8	Fuzzy Logic	1
9	Genetic Algorithms	1
10	Natural Language Processing	1
11	Neural Networks	1
12	Reinforcement Learning	1

Insight:-

It groups the results by technology and orders them in descending order of the total companies associated with each technology. This provides a clear view of the most widely adopted AI technologies across companies.

15) Average AI Investment by Industry with Comparison

```sql
SELECT i.industry_name, AVG(c.ai_investment) AS avg_investment,
       (SELECT AVG(ai_investment) FROM Company) AS global_avg_investment
FROM Industry i
INNER JOIN Company c ON i.industry_id = c.industry_id
GROUP BY i.industry_name
HAVING AVG(c.ai_investment) > (SELECT AVG(ai_investment) FROM Company)
ORDER BY avg_investment DESC;
```

	industry_name	avg_investment	global_avg_investment
1	Manufacturing	512500000.000000	261111111.111111

Insight:- This query retrieves the highest AI investment made by companies within each industry by comparing each company's investment to the maximum AI investment in its respective industry (c.industry_id). It also joins the Company and Industry tables to include the industry_name, providing a clear view of the top AI-investing company for each industry.