



AI Predict Jobs

Project 3 – Extension of Project Ideation or Project I

Data Collection:

A. Historical Job Data, Location wise trends

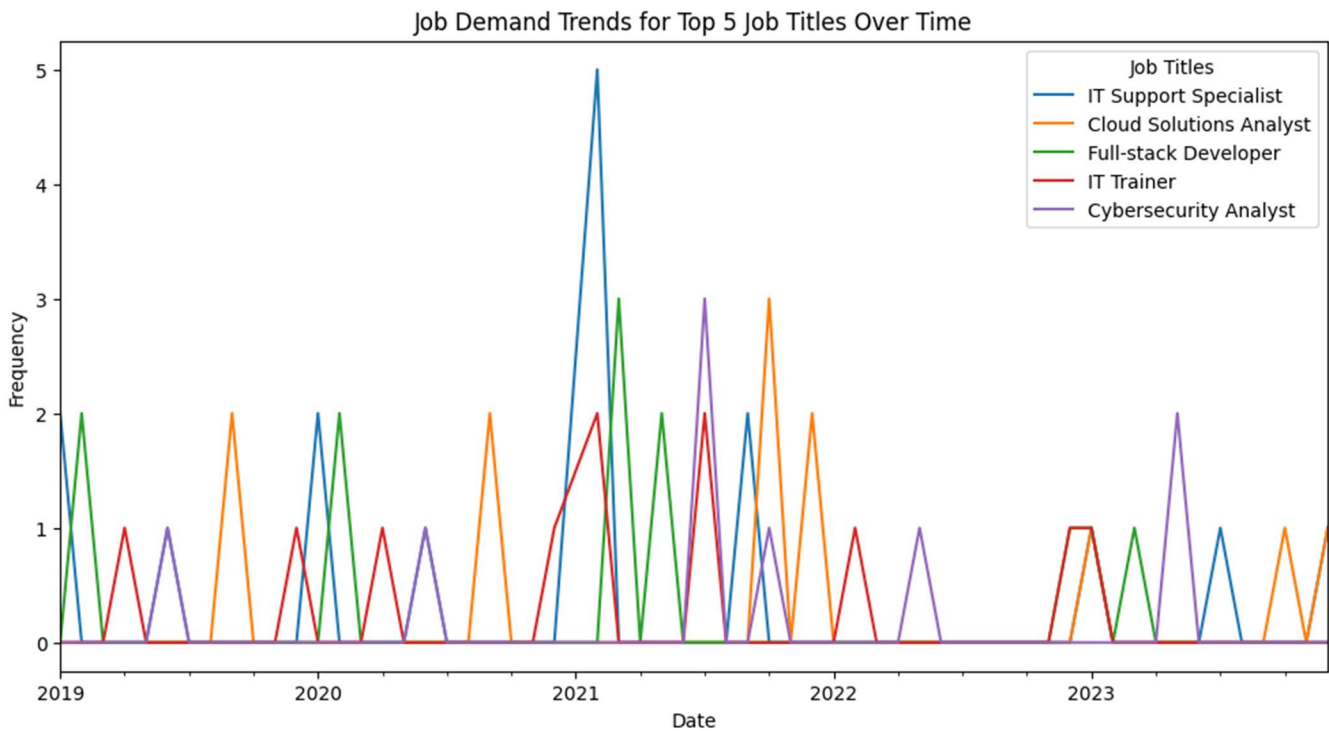
Job Title	Job Description	Required Skills	Salary Range	Location	Company	Experience Level	Industry	Job Type	Date Posted
Software Engineer	Develop software	Java, Python	£40,000 - £60,000	London	ABC Tech	Entry-Level	Technology	Full-Time	1/5/2023
Data Analyst	Analyze data	SQL, Excel	£35,000 - £50,000	Manchester	XYZ Analytics	Junior	Analytics	Full-Time	2/10/2023
Network Engineer	Maintain networks	Cisco, WAN	£45,000 - £70,000	Birmingham	Network Solutions	Mid-Level	Networking	Full-Time	3/15/2023
Cloud Architect	Design cloud	AWS, Azure	£60,000 - £90,000	Edinburgh	Cloud Innovators	Senior	Cloud Computing	Full-Time	4/20/2023
Cybersecurity Analyst	Protect data	Cybersecurity	£50,000 - £80,000	Glasgow	SecureGuard	Mid-Level	Security	Full-Time	5/25/2023
IT Project Manager	Manage projects	PMP, Agile	£70,000 - £100,00	Leeds	Project Leaders	Senior	Project Management	Full-Time	6/30/2023
Data Scientist	Analyze big data	R, Python	£55,000 - £85,000	Bristol	Data Insights	Mid-Level	Data Science	Full-Time	7/5/2023
DevOps Engineer	Streamline devops	Docker, Jenkins	£50,000 - £75,000	Newcastle	DevOps Solutions	Mid-Level	DevOps	Full-Time	8/10/2023
IT Support Analyst	Provide IT support	Windows, Linux	£30,000 - £45,000	Sheffield	IT Services	Entry-Level	Support	Full-Time	9/15/2023
UX/UI Designer	Design user interfaces	UI/UX Design	£40,000 - £70,000	Cardiff	Design Studios	Junior	Design	Full-Time	10/20/2023
Database Analyst	Manage databases	SQL, Oracle, Database Management	£40,000 - £65,000	London	Data Solutions	Mid-Level	Database	Full-Time	11/25/2023
UI Developer	Design user interfaces	HTML, CSS, JavaScript	£35,000 - £55,000	Manchester	Web Creations	Junior	Web Development	Full-Time	12/10/2023
System Administrator	Maintain systems	Windows Server, Active Directory	£45,000 - £70,000	Birmingham	System Services	Mid-Level	IT Services	Full-Time	1/15/2023
AI/ML Engineer	Develop AI models	Python, TensorFlow, AI/ML	£55,000 - £85,000	Edinburgh	AI Innovations	Mid-Level	Artificial Intelligence	Full-Time	2/20/2023
IT Auditor	Audit IT systems	Audit, Risk Management	£50,000 - £80,000	Glasgow	Audit Experts	Mid-Level	Audit	Full-Time	3/25/2023
Network Security Engineer	Secure networks	Firewall, VPN, Security	£55,000 - £90,000	Leeds	SecureNet	Mid-Level	Security	Full-Time	4/30/2023
Software Tester	Test software	Manual Testing, Bug Tracking	£30,000 - £50,000	Bristol	QA Solutions	Entry-Level	Quality Assurance	Full-Time	5/5/2023
Cloud Solutions Architect	Design cloud solutions	AWS, Azure, Architecture	£65,000 - £100,00	Newcastle	Cloud Architects	Senior	Cloud Computing	Full-Time	6/10/2023
IT Consultant	Provide IT consultancy	Consulting, IT Strategy	£60,000 - £90,000	Sheffield	IT Consultants	Senior	Consulting	Full-Time	7/15/2023
Front-end Developer	Develop web interfaces	JavaScript, React	£40,000 - £75,000	Cardiff	Web Studios	Mid-Level	Web Development	Full-Time	8/20/2023
Business Analyst	Analyze business needs	Business Analysis, Requirements	£45,000 - £80,000	London	Biz Analysts	Mid-Level	Business Analysis	Full-Time	9/25/2023
IT Helpdesk Support	Provide IT support	Troubleshooting, Customer Service	£25,000 - £40,000	Manchester	IT Helpdesk	Entry-Level	Support	Full-Time	10/30/2023
DevSecOps Engineer	Secure DevOps pipeline	DevSecOps, CI/CD	£60,000 - £95,000	Birmingham	Secure DevOps	Mid-Level	DevOps	Full-Time	11/5/2023
Data Engineer	Build data pipelines	ETL, Big Data, SQL	£50,000 - £85,000	Edinburgh	Data Engineers	Mid-Level	Data Engineering	Full-Time	12/10/2023
IT Trainer	Train IT professionals	Training, IT Education	£35,000 - £60,000	Glasgow	IT Training	Junior	Education	Full-Time	1/15/2023
Cloud Security Engineer	Secure cloud	Cloud Security, Encryption	£65,000 - £100,00	Leeds	SecureCloud	Mid-Level	Security	Full-Time	2/20/2023
IT Procurement Specialist	Procure IT resources	Procurement, Vendor Management	£50,000 - £80,000	Bristol	ProcureIT	Mid-Level	Procurement	Full-Time	3/25/2023
UX Researcher	Conduct UX research	User Research, UX Design	£45,000 - £75,000	Newcastle	UX Labs	Mid-Level	Design	Full-Time	4/30/2023
Blockchain Developer	Develop blockchain	Blockchain, Solidity	£55,000 - £90,000	Sheffield	Blockchain Tech	Mid-Level	Blockchain	Full-Time	5/5/2023
IT Risk Analyst	Analyze IT risks	Risk Assessment, Compliance	£50,000 - £80,000	Cardiff	Risk Analysts	Mid-Level	Risk Management	Full-Time	6/10/2023
Cloud Support Engineer	Support cloud	AWS, Azure, Cloud Services	£40,000 - £70,000	London	Cloud Support	Junior	Support	Full-Time	7/15/2023
IT Sales Manager	Manage IT sales team	Sales, IT Sales	£70,000 - £110,00	Manchester	Sales Leaders	Senior	Sales	Full-Time	8/20/2023
Data Privacy Officer	Ensure data privacy	GDPR, Data Protection	£55,000 - £85,000	Birmingham	Data Privacy	Mid-Level	Data Privacy	Full-Time	9/25/2023
Software Architect	Design software	Architecture, Design Patterns	£75,000 - £120,00	Edinburgh	Software Architects	Senior	Software Design	Full-Time	10/30/2023
IT Quality Analyst	Ensure software quality	QA, Testing	£45,000 - £75,000	Glasgow	QA Analysts	Mid-Level	Quality Assurance	Full-Time	11/5/2023
Mobile App Developer	Develop mobile apps	iOS, Android, Mobile Development	£50,000 - £90,000	Leeds	Mobile Devs	Mid-Level	Mobile Development	Full-Time	12/10/2023
IT Procurement Manager	Manage procurement	Procurement, Supply Chain	£70,000 - £110,00	Bristol	Procurement Mgm	Senior	Procurement	Full-Time	1/15/2023
IT Compliance Officer	Ensure IT compliance	Compliance, Regulations	£60,000 - £95,000	Newcastle	Compliance Exper	Mid-Level	Compliance	Full-Time	2/20/2023
Full-stack Developer	Develop full-stack apps	JavaScript, Node.js	£55,000 - £90,000	Sheffield	Full-stack Devs	Mid-Level	Web Development	Full-Time	3/25/2023
IT Business Analyst	Analyze IT needs	Business Analysis, IT Strategy	£50,000 - £85,000	Cardiff	IT Analysts	Mid-Level	Business Analysis	Full-Time	4/30/2023
IT Trainer Assistant	Assist IT training	Training, IT Education	£30,000 - £50,000	London	IT Training Assist	Entry-Level	Education	Full-Time	5/5/2023
AI Ethics Consultant	Ensure AI ethics	Ethics, AI Governance	£60,000 - £100,00	Manchester	AI Ethics	Mid-Level	Ethics	Full-Time	6/10/2023
IT Support Specialist	Provide IT support	Windows, Troubleshooting	£35,000 - £55,000	Birmingham	IT Support Special	Junior	Support	Full-Time	7/15/2023
Data Analytics Manager	Manage data analytics	Data Analytics, Team Management	£70,000 - £110,00	Edinburgh	Data Managers	Senior	Analytics	Full-Time	8/20/2023
IT Project Coordinator	Coordinate IT projects	Project Coordination	£40,000 - £70,000	Glasgow	Project Coordinato	Mid-Level	Project Management	Full-Time	9/25/2023
Cloud Solutions Analyst	Analyze cloud solutions	AWS, Azure, Cloud Analysis	£45,000 - £75,000	Leeds	Cloud Analysts	Mid-Level	Cloud Computing	Full-Time	10/30/2023
IT Governance Manager	Manage IT governance	IT Governance, Compliance	£65,000 - £100,00	Bristol	IT Governance Mgr	Senior	Governance	Full-Time	11/5/2023
Cybersecurity Engineer	Secure IT systems	Cybersecurity, Penetration Testing	£55,000 - £90,000	Newcastle	Cybersecurity Engi	Mid-Level	Security	Full-Time	12/10/2023
IT Procurement Analyst	Analyze IT procurement	Procurement Analysis	£50,000 - £85,000	Cardiff	Procurement Anal	Mid-Level	Procurement	Full-Time	1/15/2023
UX Designer	Design user experiences	UX Design, Prototyping	£45,000 - £75,000	London	UX Designers	Mid-Level	Design	Full-Time	2/20/2023
IT Change Manager	Manage IT changes	Change Management, IT Strategy	£60,000 - £100,00	Manchester	Change Managers	Senior	Change Management	Full-Time	3/25/2023
IT Service Desk Analyst	Provide service desk support	IT Service Desk, Troubleshooting	£30,000 - £50,000	Birmingham	Service Desk	Entry-Level	Support	Full-Time	4/30/2023
Cloud Security Analyst	Analyze cloud security	Cloud Security, Threat Analysis	£45,000 - £75,000	Edinburgh	Cloud Security	Mid-Level	Security	Full-Time	5/5/2023
IT Business Continuity Manager	Ensure business continuity	Business Continuity, Disaster Recovery	£70,000 - £110,00	Glasgow	Continuity Manag	Senior	Business Continuity	Full-Time	6/10/2023
QA Automation Engineer	Automate software testing	Test Automation, Selenium	£55,000 - £90,000	Leeds	QA Automation	Mid-Level	Quality Assurance	Full-Time	7/15/2023
Data Governance Analyst	Manage data governance	Data Governance, Data Quality	£50,000 - £85,000	Bristol	Data Governance	Mid-Level	Governance	Full-Time	8/20/2023
IT Trainer Specialist	Specialize in IT training	Training, Specialization	£40,000 - £70,000	Newcastle	IT Training Specia	Mid-Level	Education	Full-Time	9/25/2023
Machine Learning Engineer	Develop ML models	Machine Learning, Python	£60,000 - £100,00	Cardiff	ML Engineers	Mid-Level	Machine Learning	Full-Time	10/30/2023
IT Asset Manager	Manage IT assets	IT Asset Management, Inventory	£55,000 - £90,000	London	Asset Managers	Mid-Level	Asset Management	Full-Time	11/5/2023
IT Security Consultant	Provide security consultation	Security Consulting	£50,000 - £85,000	Manchester	Security Consultant	Mid-Level	Security	Full-Time	12/10/2023
Data Analyst Intern	Analyze data as an intern	SQL, Excel	£20,000 - £30,000	Birmingham	Data Interns	Internship	Analytics	Full-Time	1/15/2023
IT Sales Representative	Sell IT solutions	Sales, IT Sales	£40,000 - £70,000	Edinburgh	Sales Reps	Junior	Sales	Full-Time	2/20/2023
Cloud Migration Specialist	Migrate to the cloud	Cloud Migration, AWS, Azure	£55,000 - £90,000	Glasgow	Cloud Migrators	Mid-Level	Cloud Computing	Full-Time	3/25/2023
IT Procurement Coordinator	Coordinate IT procurement	Procurement Coordination	£45,000 - £75,000	Leeds	Procurement Coord	Mid-Level	Procurement	Full-Time	4/30/2023
IT Analyst Trainee	Train as an IT analyst	IT Analysis, Training	£25,000 - £35,000	Bristol	IT Analyst Trainee	Entry-Level	Training	Full-Time	5/5/2023
UX Research Assistant	Assist in UX research	UX Research, Support	£30,000 - £45,000	Newcastle	UX Research Assis	Entry-Level	Research	Full-Time	6/10/2023
IT Compliance Specialist	Ensure IT compliance	Compliance, Regulations	£50,000 - £85,000	Cardiff	Compliance Spec	Mid-Level	Compliance	Full-Time	7/15/2023
Software Development Intern	Intern in software dev	Programming, Internship	£20,000 - £30,000	London	Dev Interns	Internship	Software Development	Full-Time	8/20/2023
Network Administrator Trainee	Train as network admin	Networking, Training	£25,000 - £35,000	Manchester	Network Admin Tr	Entry-Level	Networking	Full-Time	9/25/2023
Cloud Solutions Intern	Intern in cloud solutions	Cloud Computing, Internship	£20,000 - £30,000	Birmingham	Cloud Interns	Internship	Cloud	Full-Time	10/30/2023
Data Engineer	Build data pipelines	Big Data, Python, SQL	£55,000 - £85,000	Cardiff	Data Innovators	Mid-Level	Data Engineering	Full-Time	1/5/2023
Software Developer	Develop software	Java, C++, Software Design	£50,000 - £80,000	Leeds	CodeCrafters	Mid-Level	Software Development	Full-Time	2/10/2023
IT Analyst	Analyze IT systems	IT Analysis, Troubleshooting	£40,000 - £65,000	Birmingham	IT Insights	Junior	IT Analysis	Full-Time	3/15/2023
Cloud Solutions Architect	Design cloud solutions	AWS, Azure, Cloud Architecture	£60,000 - £90,000	Manchester	Cloud Architects	Senior	Cloud Computing	Full-Time	4/20/2023
Cybersecurity Analyst	Protect data	Cybersecurity, Threat Analysis	£50,000 - £80,000	Edinburgh	SecureGuard	Mid-Level	Security	Full-Time	5/25/2023

Exploratory Data Analysis (EDA):

Using historical job data, we explored patterns in job demand, required skills, popular job locations, and salary ranges across experience levels. Each of these insights informs key areas of our platform, such as personalized skill recommendations, career planning advice, and targeted location-based job alerts.

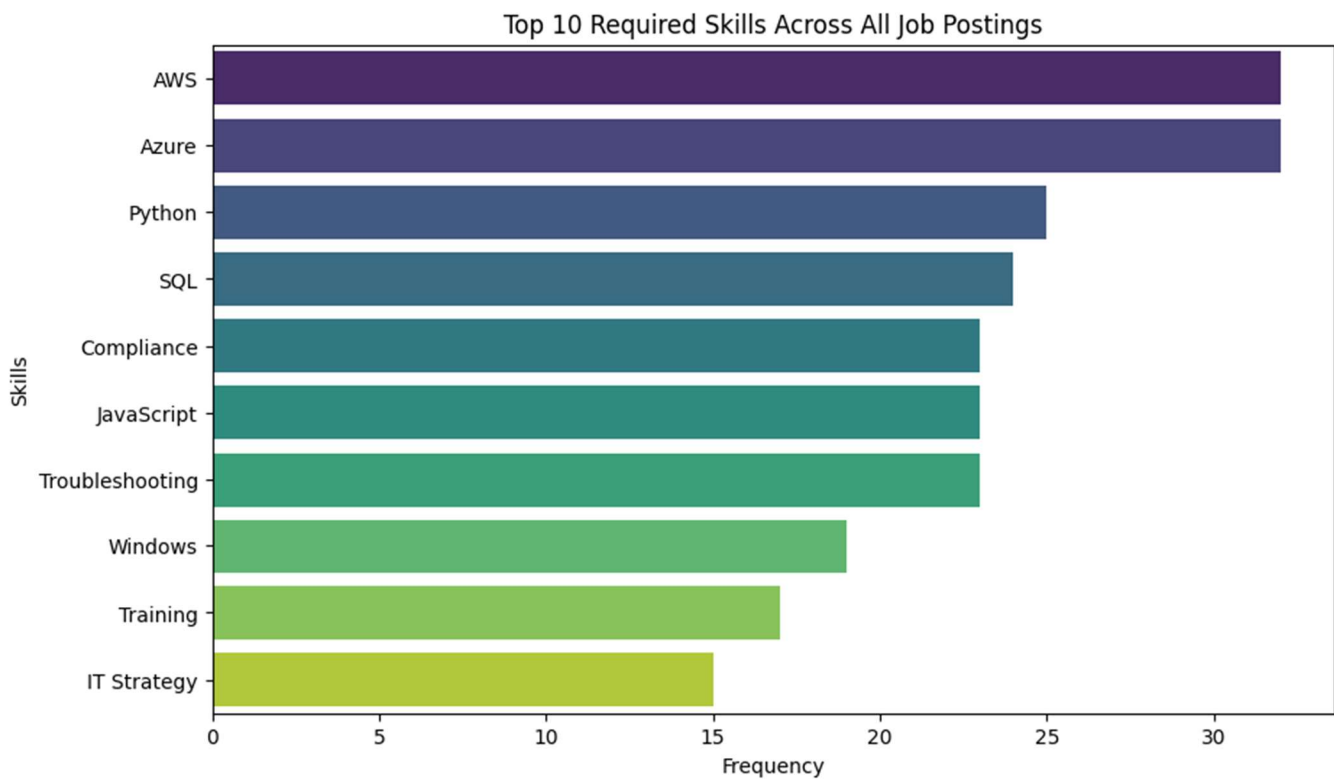
A. Job Demand Trends for Top Titles

We analyzed trends for the top 5 most demanded job titles over time to understand which roles are consistently in high demand. This insight is valuable for both job seekers and employers in planning for skills development and recruitment.



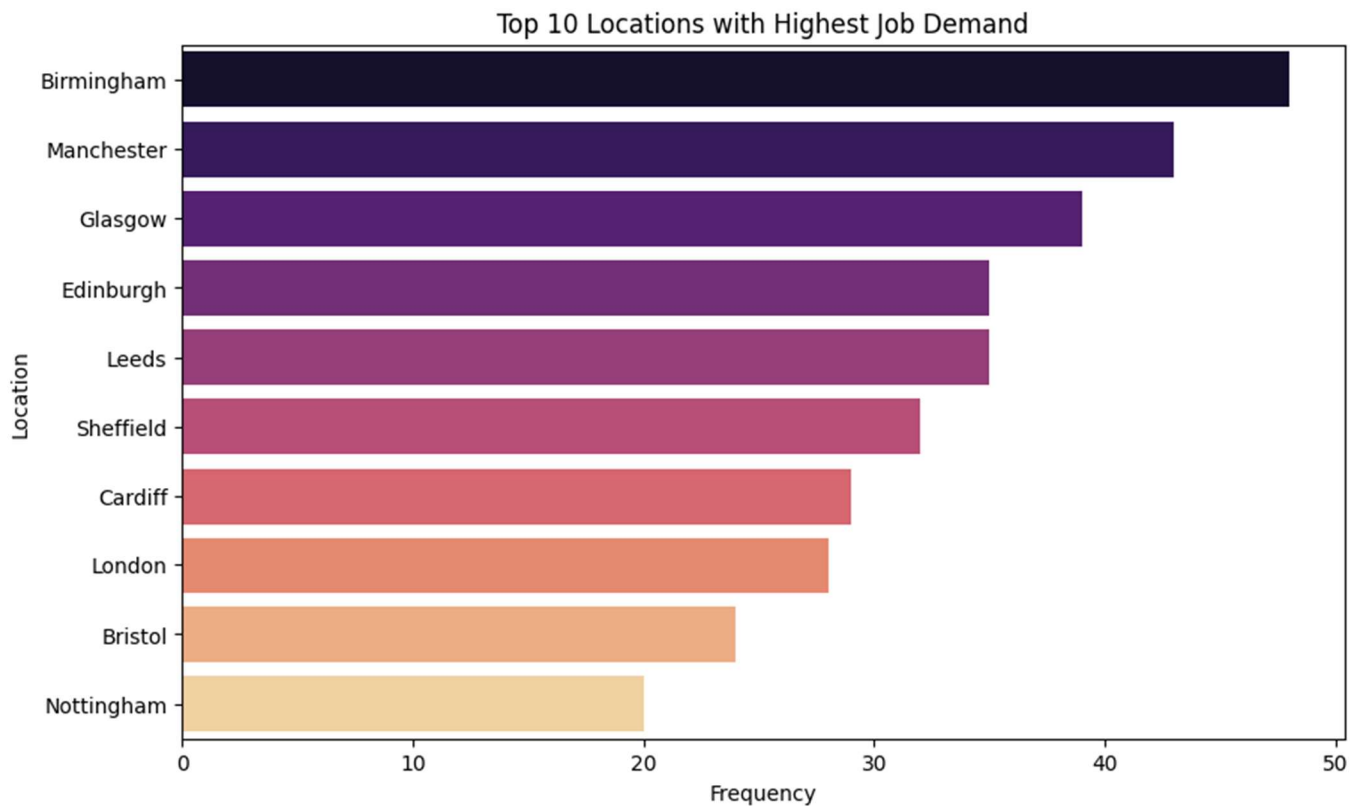
B. Skill Trends Across Job Postings

By analyzing skill trends, we identified the top 10 skills required across job postings. This can help in developing targeted training programs to close skill gaps, ensuring job seekers acquire relevant competencies.



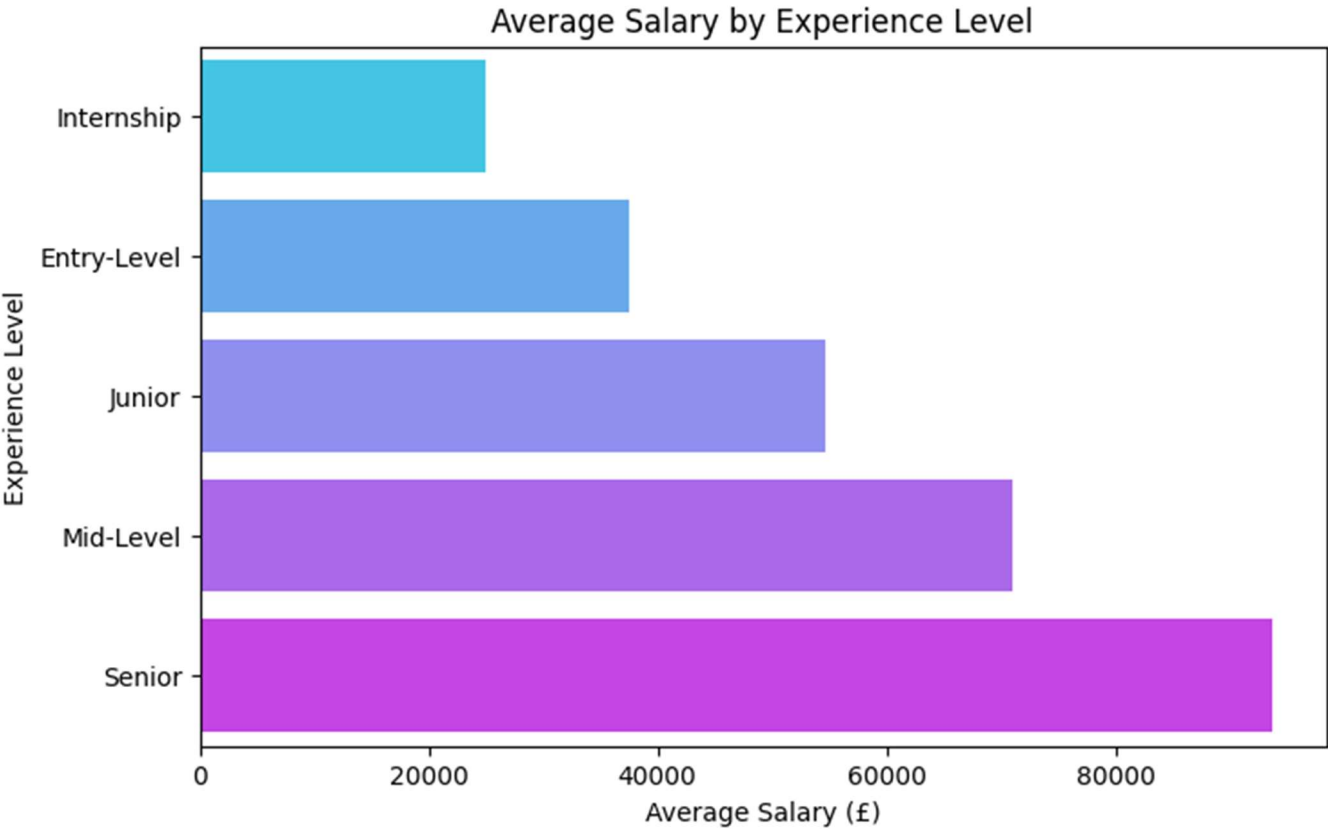
C. Location-Based Demand Analysis

We analyzed job demand based on location, identifying the top 10 regions with the highest job opportunities. This information is beneficial for job seekers planning to relocate and for companies assessing location-based talent availability.



D. Experience Level and Salary Range Analysis

We examined the relationship between experience levels and salary ranges. On average, senior-level positions tend to have higher salary offerings. This insight helps job seekers set realistic salary expectations based on their experience level.



Job Demand Forecast for "Data Scientist":

Using time series forecasting, we projected the demand for Data Scientists over the next 12 months. This information will be crucial for the platform to highlight upcoming demand trends in this field, assisting job seekers and educators in aligning with future market needs.

The forecast indicates that demand for Data Scientists is likely to grow, signaling an opportunity for skill development in this area.

```

1  # Forecasting Code for Data Scientist Demand
2  from statsmodels.tsa.holtwinters import ExponentialSmoothing
3
4  # Job Demand Trends for "Data Scientist"
5  (variable) job_demand_data: Any
6  job_demand_data = job_demand_trends[job_title].asfreq('M')
7
8  # Forecast model (Holt-Winters)
9  model = ExponentialSmoothing(job_demand_data, trend="additive", seasonal="additive", seasonal_periods=12)
10 hw_fit = model.fit()
11 forecast = hw_fit.forecast(12)
12
13 # Plotting actual and forecasted demand
14 plt.figure(figsize=(12, 6))
15 plt.plot(job_demand_data, label='Actual Demand')
16 plt.plot(forecast, label='Forecasted Demand', linestyle='--', color='orange')
17 plt.title(f"Job Demand Forecast for '{job_title}' Over Next 12 Months")
18 plt.xlabel("Date")
19 plt.ylabel("Job Demand")
20 plt.legend()
21 plt.show()
22

```

Financial Analysis:

The financial equation for the **AI Predict Jobs** platform considers customer subscription revenue, ad revenue, and monthly costs to determine the overall profitability of the platform.

Financial Equation:

Financial Outcome = [(No. of Customers × Subscription Fee) + Ad Revenue] – Total Cost

Parameters:

- **Number of Customers:** 1,000
- **Subscription Fee:** \$50
- **Ad Revenue:** \$10,000
- **Total Monthly Cost:** \$30,000

Results:

- **Customer Revenue:** \$50,000
- **Ad Revenue:** \$10,000
- **Total Revenue:** \$60,000

- **Total Cost:** \$30,000
- **Net Financial Outcome:** \$30,000 (profit)

The calculation indicates a positive financial outcome, suggesting the platform could be profitable with the given assumptions.

```
def calculate_financial_equation(num_customers, subscription_fee, ad_revenue, total_cost):
    """
    Calculate the financial outcome for an AI-based job prediction platform.

    Parameters:
    - num_customers (int): Number of customers subscribed to the platform.
    - subscription_fee (float): Subscription fee per customer (e.g., monthly).
    - ad_revenue (float): Monthly advertisement revenue.
    - total_cost (float): Total monthly operational costs (e.g., server, marketing).

    Returns:
    - float: The calculated financial outcome (profit or loss).
    """
    # Calculate total revenue from customers and ads
    customer_revenue = num_customers * subscription_fee
    total_revenue = customer_revenue + ad_revenue

    # Calculate the financial outcome (profit/loss)
    financial_outcome = total_revenue - total_cost

    # Print details of the financial breakdown
    print("=== Financial Calculation Breakdown ===")
    print(f"Number of Customers: {num_customers}")
    print(f"Subscription Fee per Customer: {subscription_fee}")
    print(f"Customer Revenue: {customer_revenue}")
    print(f"Ad Revenue: {ad_revenue}")
    print(f"Total Revenue (Customer + Ad): {total_revenue}")
    print(f"Total Monthly Costs: {total_cost}")
    print(f"Financial Outcome (Profit/Loss): {financial_outcome}")

    return financial_outcome

# Example usage of the function with hypothetical values
num_customers = 1000          # Number of customers using the platform
subscription_fee = 50         # Subscription fee per customer in currency units
ad_revenue = 10000            # Monthly ad revenue in currency units
total_cost = 30000            # Total monthly costs in currency units

# Calculate the financial result
financial_result = calculate_financial_equation(num_customers, subscription_fee, ad_revenue, total_cost)

# Print the final financial outcome
print("\n=== Final Financial Result ===")
print(f"Net Financial Outcome: {financial_result}")
```

Github Link: <https://github.com/saxenasajal03/Fyenn-Labs/tree/main/Project%203>