Project Title:

Job Market Insights from Arab Countries using Bayt.com Job Listings

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Website to Scrape:

bayt.com – One of the largest online job portals in the Middle East and North Africa.

Project Objective :

To analyze and compare the job markets in **Egypt** and **Saudi Arabia** by extracting real-time job data and generating actionable insights for:

- Job seekers

- career advisors

Key Insights to Extract :

- Most demanded **skills** per country and industry

- Trends in **work types** (remote vs on-site vs hybrid)

- **Experience level** vs number of available jobs

- **Biases** in employer preferences (age, gender, nationality)

- Most popular **roles** in each country

. Overall **comparison** between Egypt and Saudi Arabia job markets

Approach:

1. Data Extraction:

- Use requests, BeautifulSoup .
- Automate the navigation between job list pages and detailed job pages.
- Store extracted data into structured formats (e.g., CSV, JSON).

2. Data Cleaning:

- Normalize missing values and standardize text fields.
- Convert string-based numeric fields (e.g., "3+ years") to integer values.
- Standardize location and job category fields.
- Using Regular Expressions to extract meaningful information

3. Data Analysis:

- Job frequency by country, industry, and experience level
- Distribution of remote vs hybrid vs on-site jobs
- Required skills heatmap
- Candidate preference trends
- Keyword extraction from job descriptions

4. Data Visualization:

- Use Matplotlib, Seaborn, and Plotly for interactive charts
- Create summary dashboards (e.g., most demanded jobs, most mentioned skills)

• Optional: build a mini dashboard using Streamlit

Brief Description of the Data:

• We will scrape job listings from different Arab countries (Egypt, Saudi Arabia).
• For each job post, we will extract both summary and detailed information, including:
  ◦ Job Title
  ◦ Company Name
  ◦ Country and City
  ◦ Date Posted
  ◦ Work Type (Remote, Hybrid, On-site)
  ◦ Years of Experience
  ◦ Number of Vacancies
  ◦ Job Category (e.g., Marketing, IT)
  ◦ Company Size and Industry
  ◦ Job Description
  ◦ Required Skills
  ◦ Preferred Candidate Criteria (e.g., Age, Gender, Nationality)

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Expected Outcome:

A clean, structured dataset of real job listings across two Arab countries, and a set of analytical visualizations revealing insights into regional job market trends.

Job Market Insights Analysis

Overview :

This project provides a comprehensive, data-driven analysis of job listings in **Egypt** and **Saudi Arabia**, uncovering key hiring trends, in-demand job roles, and experience requirements. Developed using **Python**, **Streamlit**, and essential data science libraries, the platform offers an interactive dashboard designed for job seekers, HR professionals, and labor market analysts.

Objectives :

- Highlight top hiring cities, companies, and job titles
- Analyze job distributions based on experience, level, gender, and industry
- Provide a comparative view of the Egyptian and Saudi Arabian job markets
- Present actionable insights through dynamic visualizations

Tools & Technologies :

- **Python 3.10+**
- **Streamlit** – for building interactive dashboards
- **Pandas** – for data manipulation and transformation
- **Matplotlib & Seaborn** – for visual representation of insights
- **WordCloud** – for text-based visualizations of job titles

Data Processing

The raw job listing data is thoroughly cleaned and prepared through a structured pipeline that includes:

- Removing duplicates and irrelevant records
- Handling missing values and standardizing textual features
- Encoding categorical variables and deriving new analytical features such as experience ranges and job level classifications

Key Visualizations

The platform includes **12 core visualizations** for each country:

- **Job Distribution by City**
- **Jobs by Company**
- **Top Job Titles**
- **Work Type Distribution** (Remote, Onsite, Hybrid)
- **Jobs by Gender**
- **Jobs by Job Level**
- **Experience Requirements**
- **Industry-wise Job Postings**
- **Job Trends Over Time**
- **Job Type and Gender Breakdown**
- **City vs. Job Level Heatmap**
- **Word Cloud of Top Job Titles**

Each visualization is generated dynamically based on user selections within the dashboard.

Market Comparison

A dedicated comparison module presents a **side-by-side analysis** of the job markets in Egypt and Saudi Arabia across various dimensions:

- Specialization demand
- Industry and company trends
- Required experience levels and job seniority
- Gender-specific hiring patterns

This comparison helps stakeholders understand region-specific employment landscapes.

Target Audience

- **Job Seekers** – Discover hiring patterns by role, skill, and location
- **HR Professionals** – Monitor workforce trends and employer demands
- **Researchers & Analysts** – Investigate market dynamics and labor distribution
- **Data Enthusiasts** – Explore practical applications of EDA and dashboard development

Future Enhancements

- Add interactive filters by year, industry, and experience range
- Integrate real-time job listing APIs
- Include salary range analysis and predictions
- Enable bilingual support (Arabic & English)
- Deploy the app via a cloud hosting platform (e.g., Streamlit Cloud or AWS)

Key Insights from the Project :

This project uncovered several valuable insights into the job markets of **Egypt** and **Saudi Arabia**, based on comprehensive data analysis and visualization:

◇ Market Structure & Demand

- **Cairo** and **Riyadh** are the top hiring cities, reflecting their roles as economic hubs in their respective countries.
- Most job postings are concentrated in a few key sectors, particularly **Information Technology**, **Banking**, and **Healthcare**.

- A small number of employers dominate the listings, indicating a concentration of hiring power in certain industries.

◇ Experience & Job Level Trends

- The majority of job listings target candidates with **2 to 5 years** of experience, showing a strong preference for semi-experienced professionals.
- Most opportunities are in the **Entry-Level** and **Mid-Level** categories, while **Senior** and **Managerial** roles are relatively scarce.
- **Internship and fresh graduate positions** appear more frequently in Egypt than in Saudi Arabia, suggesting different talent development approaches.

◇ Gender & Work Type Distribution

- The majority of listings are **gender-neutral**, although some sectors in Saudi Arabia still show a noticeable preference for male candidates.
- **Onsite work** remains the dominant work mode across both markets, but **remote** and **hybrid** roles are increasing—especially in tech and digital sectors.

◇ Regional Differences

- **Saudi Arabia's job market** is more centralized, with most demand focused in a few major cities, whereas **Egypt** shows a more regionally distributed demand.
- The most in-demand **specializations** vary between the two countries: engineering roles are more prevalent in Saudi Arabia, while Egypt shows higher demand for **marketing**, **customer service**, and **administrative** positions.

◇ Practical Implications

These insights can be useful for a wide range of stakeholders:

- **Job seekers** can align their skills and expectations with actual market demand.
- **Employers** can benchmark their hiring strategies against market trends.
- **Researchers and policymakers** can identify employment gaps and design targeted workforce development programs.