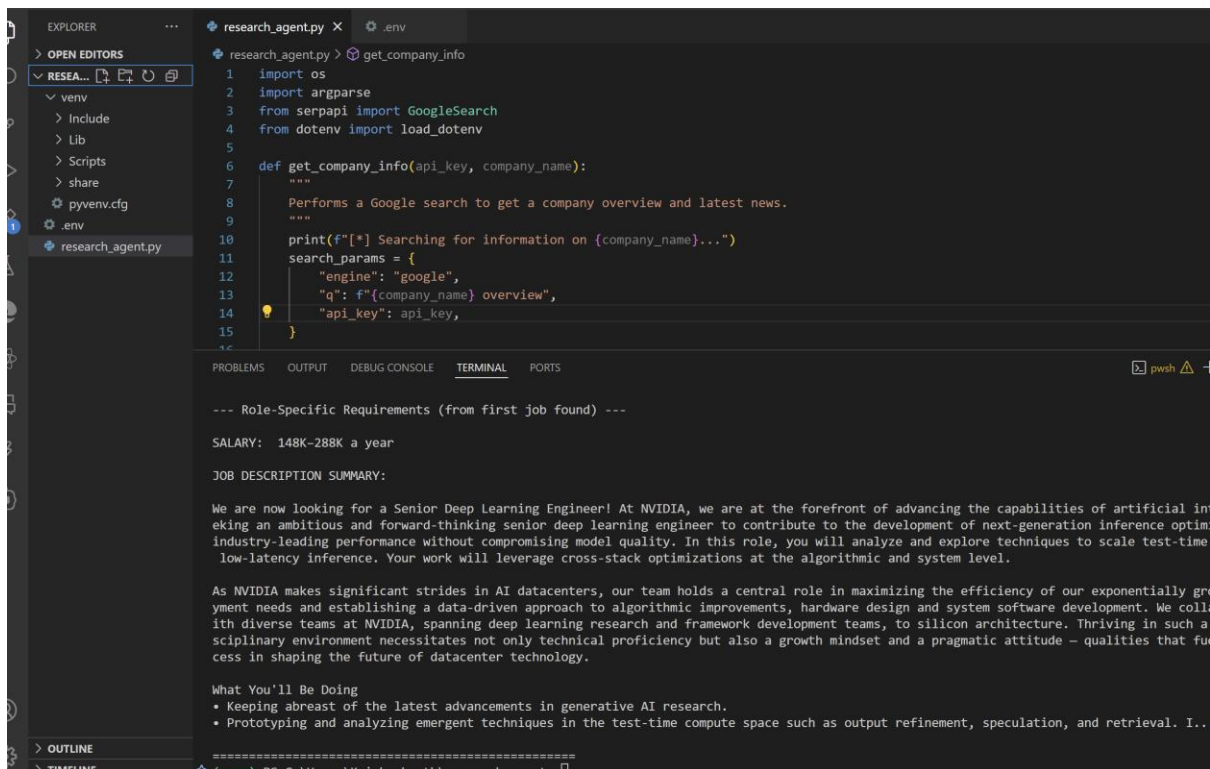# Research Agent (Web Search and Data Extraction)

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University: Vellore Institute of Technology

Project Task: **Research Agent (Web Search and Data Extraction)**

Project folder:

## Program Code:

```python
import os
import argparse
from serpapi import GoogleSearch
from dotenv import load_dotenv

def get_company_info(api_key, company_name):
    """
    Performs a Google search to get a company overview and latest news.
    """
    print(f"[*] Searching for information on {company_name}...")
    search_params = {
        "engine": "google",
        "q": f"{company_name} overview",
        "api_key": api_key,
    }

    search = GoogleSearch(search_params)
    results = search.get_dict()

    # --- Extracting a better, more reliable description ---
    description = "No company description found."
    if results.get("knowledge_graph"):
        description = results["knowledge_graph"].get("description",
description)
    elif results.get("organic_results"):
        description = results["organic_results"][0].get("snippet",
description)

    # --- Performing a more focused search for news ---
    news_results = results.get("news_results", [])
    if not news_results: # If the first search didn't bring news, try a
dedicated news search
        print("[*] Initial search had no news, running a dedicated news
search...")
        news_search_params = {
            "engine": "google",
            "q": f"{company_name} latest news",
            "tbm": "nws", # tbm="nws" specifies a News search
            "api_key": api_key,
        }
        news_search = GoogleSearch(news_search_params)
        news_results = news_search.get_dict().get("news_results", [])

    news_summary = "\n".join([f"- {news['title']}. [Source: {news['source']}]"
for news in news_results[:3]])
    if not news_summary:
```

```python
        news_summary = "No recent news found."

    return {"description": description, "news": news_summary}


def get_job_role_requirements(api_key, company_name, job_role):
    """
    Searches for a specific job role using the Google Jobs engine for reliable
data.
    """
    print(f"[*] Searching for the role: {job_role} at {company_name} using the
Google Jobs engine...")
    search_params = {
        "engine": "google_jobs",
        "q": f'{job_role} {company_name}',
        "api_key": api_key,
    }
    search = GoogleSearch(search_params)
    results = search.get_dict()

    if "error" in results:
        return {"summary": results["error"], "salary": "Not found"}

    if not results.get("jobs_results"):
        return {"summary": "Could not find any job postings for this role.",
"salary": "Not found"}

    # --- We now get structured data, no more manual scraping! ---
    first_job_result = results["jobs_results"][0]

    # The description is usually clean and well-formatted
    summary = first_job_result.get("description", "No description found.")

    # Look for salary information in the detected_extensions
    salary = "Not specified"
    if "detected_extensions" in first_job_result and "salary" in
first_job_result["detected_extensions"]:
        salary = first_job_result["detected_extensions"]["salary"]

    return {"summary": summary, "salary": salary}


def main():
    load_dotenv()

    parser = argparse.ArgumentParser(description="A research agent to find
company and job role information.")
    parser.add_argument("company_name", type=str, help="The name of the
company to research.")
```

```python
    parser.add_argument("job_role", type=str, help="The job role to look
for.")
    args = parser.parse_args()

    api_key = os.getenv("SERPAPI_KEY")
    if not api_key:
        print("Error: SERPAPI_KEY not found. Make sure you have created a .env
file with your API key.")
        return

    company_info = get_company_info(api_key, args.company_name)
    role_info = get_job_role_requirements(api_key, args.company_name,
args.job_role)

    # --- Print the final report ---
    print("\n" + "="*50)
    print(f"Research Report: {args.company_name} - {args.job_role}")
    print("="*50 + "\n")

    print("--- Company Overview ---")
    print(company_info["description"])
    print("\n--- Latest News ---")
    print(company_info["news"])

    print("\n" + "="*50 + "\n")

    print("--- Role-Specific Requirements (from first job found) ---")
    print("\nSALARY: ", role_info["salary"])
    print("\nJOB DESCRIPTION SUMMARY:\n")
    # Print first 1500 characters of the description for readability
    print(role_info["summary"][:1500] + "...")
    print("\n" + "="*50)


if __name__ == "__main__":
    main()
```

# Output:

# Example 1,

```
==================================================
(venv) PS C:\Users\Krishnakanth\research_agent> python research_agent.py "Microsoft" "Cloud Solutions Architect"
 [*] Searching for information on Microsoft...
 [*] Initial search had no news, running a dedicated news search...
```

```
[*] Initial search had no news, running a dedicated news search...
[*] Searching for the role: Cloud Solutions Architect at Microsoft using the Google Jobs engine...

==================================================
Research Report: Microsoft - Cloud Solutions Architect
==================================================

--- Company Overview ---
We develop and market software, services, and hardware devices that deliver new opportunities, greater convenience, and enhanced value to people's lives.

--- Latest News ---
- Microsoft incorporates OpenAI's GPT-5 into consumer, developer and enterprise offerings - Source. [Source: Microsoft]
- Update your PC with Lifetime Microsoft Office 2021 and Windows 11 Pro keys from only $15. [Source: TweakTown]
- Copilot 3D is Microsoft's latest generative AI experiment. [Source: BetaNews]

==================================================

--- Role-Specific Requirements (from first job found) ---

SALARY:  85.1K-223K a year

JOB DESCRIPTION SUMMARY:

We are looking for a Cloud Solution Architect - Cloud + AI Data with deep expertise in data platforms and analytics to support customers in building secure,
calable, and AI-ready solutions on Microsoft Azure.

In this customer-facing role, you'll guide organizations through their data modernization and AI journeys—leading architectural design sessions, proof-of-con
ept initiatives, and production deployments for mission-critical workloads. Your focus will be on ensuring performance, resiliency, and security across solut
ons that drive measurable business value.

As a key member of the Cloud + AI Data team, you'll use established repeatable IP and execution frameworks to deliver high-quality outcomes and accelerate so
ution adoption. You'll work with cutting-edge technologies such as Microsoft Fabric, Azure Databricks, Cosmos DB, and Purview, helping unlock the full value
f their data and AI investments.

Microsoft's mission is to empower every person and every organization on the planet to achieve more. As employees, we come together with a growth mindset, in
ovate to empower others, and collaborate to realize our shared goals. Each day we build on our values of respect, integrity, and accountability to create a c
lture of inclusion where everyone can thrive at work and beyond.

Responsibilities

Business Impact:
• Operates according to required operational excellence and proven practice standards throughout all sales stages/activities/tools of record (e.g., pipeline
pdate...
```

# Example 2

```
==================================================
(venv) PS C:\Users\Krishnakanth\research_agent> python research_agent.py "NVIDIA" "Deep Learning Engineer"
[*] Searching for information on NVIDIA...
[*] Initial search had no news, running a dedicated news search...
[*] Searching for the role: Deep Learning Engineer at NVIDIA using the Google Jobs engine...


==================================================
Research Report: NVIDIA - Deep Learning Engineer
==================================================


--- Company Overview ---
NVIDIA is the Engine of AI. NVIDIA engineers the most advanced chips, systems, and software for the AI factories of the future. · Reinventing Modern Graphics.


--- Latest News ---
- Nvidia is willing to pay the US government $3 billion to save its business in China. [Source: Yahoo Finance]
- Where Will Nvidia Be in 5 Years?. [Source: The Motley Fool]
- Nvidia (NASDAQ: NVDA) Bull, Base, & Bear Price Prediction and Forecast (Aug 8). [Source: 24/7 Wall St.]


==================================================


--- Role-Specific Requirements (from first job found) ---

SALARY:  148K-288K a year

JOB DESCRIPTION SUMMARY:

We are now looking for a Senior Deep Learning Engineer! At NVIDIA, we are at the forefront of advancing the capabilities of artificial intelligence. We are se
eking an ambitious and forward-thinking senior deep learning engineer to contribute to the development of next-generation inference optimizations and deliver
industry-leading performance without compromising model quality. In this role, you will analyze and explore techniques to scale test-time compute and optimize
 low-latency inference. Your work will leverage cross-stack optimizations at the algorithmic and system level.

As NVIDIA makes significant strides in AI datacenters, our team holds a central role in maximizing the efficiency of our exponentially growing inference deplo
yment needs and establishing a data-driven approach to algorithmic improvements, hardware design and system software development. We collaborate extensively w
ith diverse teams at NVIDIA, spanning deep learning research and framework development teams, to silicon architecture. Thriving in such a high-impact, interdi
sciplinary environment necessitates not only technical proficiency but also a growth mindset and a pragmatic attitude — qualities that fuel our collective suc
cess in shaping the future of datacenter technology.

What You'll Be Doing
• Keeping abreast of the latest advancements in generative AI research.
• Prototyping and analyzing emergent techniques in the test-time compute space such as output refinement, speculation, and retrieval. I...
```

# Example 3

```
==================================================
(venv) PS C:\Users\Krishnakanth\research_agent> python research_agent.py "Tesla" "Mechanical Design Engineer"
[*] Searching for information on Tesla...
[*] Initial search had no news, running a dedicated news search...
[*] Searching for the role: Mechanical Design Engineer at Tesla using the Google Jobs engine...

==================================================
Research Report: Tesla - Mechanical Design Engineer
==================================================

--- Company Overview ---
With over 100,000 employees, our teams design, build, sell and service our products in-house. To shift humanity away from fossil fuels, we need extreme scale.

--- Latest News ---
- Tesla's North American director of service leaves EV maker. [Source: Reuters]
- Tesla FSD V14 to Include Reduced Driver Monitoring. [Source: Not a Tesla App]
- Tesla Stock (TSLA) on the Move: What's Driving Gains Today?. [Source: Tokenist]

==================================================

--- Role-Specific Requirements (from first job found) ---

SALARY:  Not specified

JOB DESCRIPTION SUMMARY:

About the position

Responsibilities
• Design and develop mechanical systems and components for engineering projects.
• Collaborate with cross-functional teams to ensure design feasibility and manufacturability.
• Conduct testing and validation of mechanical designs to meet performance standards.
• Create and maintain detailed engineering documentation and specifications.
• Participate in design reviews and provide feedback to improve product designs.

Requirements
• Bachelor's degree in Mechanical Engineering or a related field.
• 3+ years of experience in mechanical design engineering.
• Proficiency in CAD software (e.g., SolidWorks, CATIA).
• Strong understanding of materials and manufacturing processes.
• Experience with design validation and testing methodologies.
```

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**Nice-to-haves**
- Experience in the automotive or aerospace industry.
- Familiarity with FEA (Finite Element Analysis) tools.
- Knowledge of thermal and fluid dynamics principles.
- Strong problem-solving skills and attention to detail.

**Benefits**
- Health insurance coverage
- 401k retirement savings plan
- Paid holidays and vacation time
- Professional development opportunities
- Employee discounts on Tesla products...

```
==================================================
(venv) PS C:\Users\Krishnakanth\research agent>
```