Gen AI Task: Build an SHL Assessment Recommendation System

Problem Overview

Hiring managers often struggle to find the right assessments for the roles that they are hiring for. The current system relies on keyword searches and filters, making the process time-consuming and inefficient. Your task is to build an **intelligent recommendation system** that simplifies this process. Given a **natural language query or a job description text or URL**, your application should return a list of relevant SHL assessments. You can take a look at the data sources that you are going to work with here, https://www.shl.com/solutions/products/product-catalog/

Your Task

Design and develop a web application that:

1. Takes a given natural language query or job description text URL
2. Recommends at most 10 (min 1) most relevant Individual test solutions from *here* in the tabular format
3. Each recommendation needs to have at least the following attributes
   - Assessment name and URL (linked to SHL's catalog)
   - Remote Testing Support (Yes/No) and Adaptive/IRT Support (Yes/No)
   - Duration and Test type

Submission Materials

You need to submit the following items using this form.

- Three URLs, 1) First URL where you can host the working demo (we type in queries and see the result) 2) API end point which can be queried using a query or piece of text and returns result in JSON (API Configurations mentioned below in Appendix 2) 3) URL of the code on GitHub which we can see (**URL of the complete code - Including your experiments and evaluation**)

- 1-page document outlining your approach on how you solved this problem. Write this document as concisely as possible with appropriate information. Highlight the tools, libraries that you have used.

These points are vital for us to evaluate the technical completeness and robustness of your solution:

- **Accessibility**: Ensure that the API URL providing access to your recommendation engine is functional, your code is accessible via a public or private (shared with us) GitHub repository, and the UI (if you build one) is reachable and working.

- **Evaluation**: You must detail the evaluation metrics you used, the achieved evaluation score, and the strategies you tried to measure the system's performance. Implementation and clear documentation of your evaluation pipeline and results are mandatory for this option. **(This is critical to consider your submission, and you can find the test dataset to evaluate and report metric at the bottom of this document)**

(Optional) **Optimization**: You are welcome to briefly document any efforts you put into optimizing the overall performance score, including initial results and how you improved them.

Evaluation Criteria

We will be using the following criteria to evaluate your solution.

- Approach: The approach that you took to solve this problem. How have you crawled, represented, stored, and searched the data? How much of emerging LLM stack that you leveraged? We love evals and tracing -- would like to see how you have leveraged those.

- Accuracy: Accuracy on a benchmark set. Measured using Mean Recall@3 and MAP@3.

- Demo quality: The quality of the end-to-end demo and attention to the details. It is OK if you do not have front-end skills. You can use low-code frameworks like Streamlit, Gradio.

Resources

You are not restricted to use these – feel free to use from anywhere else. Number of cloud platforms allow you to host applications and APIs for free for some time. Feel free to leverage those.

1. LLMs/Gemini Free APIs: *https://ai.google.dev/gemini-api/docs/pricing*

Index: Metrics to compute accuracy

Your solution will be assessed using the following **ranking evaluation metrics**:

1. Mean Recall@K

This metric measures how many of the **relevant assessments** were retrieved in the **top K recommendations**, averaged across all test queries.

$$Recall@K = \frac{\text{Number of relevant assessments in top K}}{\text{Total relevant assessments for the query}}$$

$$MeanRecall@K = \frac{1}{N} \sum_{i=1}^{N} Recall@K_i$$

where **N** is the total number of test queries.

2. Mean Average Precision @K (MAP@K)

MAP@K evaluates both the **relevance** and **ranking order** of retrieved assessments by calculating **Precision@k** at each relevant result and averaging it over all queries.

$$AP@K = \frac{1}{\min(K, R)} \sum_{k=1}^{K} P(k) \cdot rel(k)$$

$$MAP@K = \frac{1}{N} \sum_{i=1}^{N} AP@K_i$$

where:

- **R** = total relevant assessments for the query
- **P(k)** = precision at position **k**
- **rel(k)** = 1 if the result at position **k** is relevant, otherwise 0
- **N** = total number of test queries

A higher **Mean Recall@K** and **MAP@K** indicate a better-performing recommendation system.

Appendix 1: Metrics to compute accuracy

Here are some of the queries that you can use to test your application.

- I am hiring for Java developers who can also collaborate effectively with my business teams. Looking for an assessment(s) that can be completed in 40 minutes.

- Looking to hire mid-level professionals who are proficient in Python, SQL and Java Script. Need an

assessment package that can test all skills with max duration of 60 minutes.

- Here is a [JD text](), can you recommend some assessment that can help me screen applications. Time limit is less than 30 minutes.

- I am hiring for an analyst and wants applications to screen using Cognitive and personality tests, what options are available within 45 mins.

Appendix 2: API Structure & Endpoints

This section outlines the required API configuration for the take-home assignment. Your API must implement the endpoints described below exactly as specified to ensure proper evaluation of your submission.

Base requirements:

- Your API should be accessible via HTTP/HTTPS

- All responses should use proper HTTP status codes

- All data exchanges must be in JSON format

Required Endpoints:

1. **Health Check Endpoint:** This endpoint provides a simple status check to verify the API is running.

   Request:
   - Method: `GET`
   - Path: `<YOUR-BASE-URL>/health`

   Response:
   - Content-Type: `application/json`
   - Status Code: `200 OK` (if healthy)
   - Body:

   ```
   {
       "status": "healthy"
   }
   ```

2. **Assessment Recommendation Endpoint:** This endpoint accepts a job description or Natural language query and returns recommended relevant assessments (At most 10, minimum 1) based on the input.

   Request:
   - Method: `POST`
   - Path: `<YOUR-BASE-URL>/recommend`
   - Content-Type: `application/json`
   - Body:

   ```
   {
       "query": "JD/query in string"
   }
   ```

   Response:
   - Content-Type: `application/json`
   - Status Code: `200 OK` (if successful)
   - Body:

   ```
   {
       "recommended_assessments": [
           {
               "url": "Valid URL in string",
               "adaptive_support": "Yes/No",
               "description": "Description in string",
               "duration": 60,
               "remote_support": "Yes/No",
               "test_type": ["List of string"]
           }
       ]
   }
   ```

Response Fields Explanation: For the /recommend endpoint response ->

Field	Type	Description
url	String	Valid URL to the assessment resource
adaptive_support	String	Either "Yes" or "No" indicating if the assessment supports adaptive testing
description	String	Detailed description of the assessment
duration	Integer	Duration of the assessment in minutes
remote_support	String	Either "Yes" or "No" indicating if the assessment can be taken remotely
test_type	Array of Strings	Categories or types of the assessment

Example Response:

```
{
    "recommended_assessments": [
        {
            "url": "https://www.shl.com/solutions/products/product-catalog/view/python-new/",
            "adaptive_support": "No",
            "description": "Multi-choice test that measures the knowledge of Python programming, databases, modules and library. For
            "duration": 11,
            "remote_support": "Yes",
            "test_type": ["Knowledge & Skills"]
        },
        {
            "url": "https://www.shl.com/solutions/products/product-catalog/view/technology-professional-8-0-job-focused-assessment/"
            "adaptive_support": "No",
            "description": "The Technology Job Focused Assessment assesses key behavioral attributes required for success in fast-pa
            "duration": 16,
            "remote_support": "Yes",
            "test_type": ["Competencies", "Personality & Behaviour"]
        }
    ]
}
```

Testing your API: Before submitting your API link, please verify that ->

1. Both endpoints are functioning correctly

2. The response formats match exactly what is given

To assist you with implementing the evaluation component of your chosen assignment, we have attached a test set that you can use in your evaluation pipeline.

SHL Assessment Recommendations

Query	Assessments	URL
I am hiring for Java developers who can also collaborate effectively with my business teams. Looking for an assessment(s) that can be completed in 40 minutes.	Automata - Fix (New)	SHL	https://www.shl.com/solutions/products/product-catalog/view/automata-fix-new/
	Core Java (Entry Level) (New)	SHL	https://www.shl.com/solutions/products/product-catalog/view/core-java-entry-level-new/
	Java 8 (New)	SHL	https://www.shl.com/solutions/products/product-catalog/view/java-8-new/
	Core Java (Advanced Level) (New)	SHL	https://www.shl.com/solutions/products/product-catalog/view/core-java-advanced-level-new/
	Agile Software Development	SHL	https://www.shl.com/solutions/products/product-catalog/view/agile-software-development/

	Technology Professional 8.0 Job Focused Assessment | SHL	https://www.shl.com/solutions/products/product-catalog/view/technology-professional-8-0-job-focused-assessment/
	Computer Science (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/computer-science-new/
I want to hire new graduates for a sales role in my company, the budget is for about an hour for each test. Give me some options	Entry level Sales 7.1 (International) | SHL	https://www.shl.com/solutions/products/product-catalog/view/entry-level-sales-7-1/
	Entry Level Sales Sift Out 7.1 | SHL	https://www.shl.com/solutions/products/product-catalog/view/entry-level-sales-sift-out-7-1/
	Entry Level Sales Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/entry-level-sales-solution/
	Sales Representative Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/sales-representative-solution/
	Sales Support Specialist Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/sales-support-specialist-solution/
	Technical Sales Associate Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/technical-sales-associate-solution/
	SVAR - Spoken English (Indian Accent) (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/svar-spoken-english-indian-accent-new/
	Sales & Service Phone Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/sales-and-service-phone-solution/
	Sales & Service Phone Simulation | SHL	https://www.shl.com/solutions/products/product-catalog/view/sales-and-service-phone-simulation/
	English Comprehension (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/english-comprehension-new/
I am looking for a COO for my company in China and I want to see if they are culturally a right fit for our company. Suggest me an assessment that they can complete in about an hour	Motivation Questionnaire MQM5 | SHL	https://www.shl.com/solutions/products/product-catalog/view/motivation-questionnaire-mqm5/
	Global Skills Assessment | SHL	https://www.shl.com/solutions/products/product-catalog/view/global-skills-assessment/
	Graduate 8.0 Job Focused Assessment | SHL	https://www.shl.com/solutions/products/product-catalog/view/graduate-8-0-job-focused-assessment-4228/
Content Writer required, expert in English and SEO.	Drupal (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/drupal-new/
	Search Engine Optimization (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/search-engine-optimization-new/
	Administrative Professional - Short Form | SHL	https://www.shl.com/solutions/products/product-catalog/view/administrative-professional-short-form/
	Entry Level Sales Sift Out 7.1 | SHL	https://www.shl.com/solutions/products/product-catalog/view/entry-level-sales-sift-out-7-1/
	General Entry Level – Data Entry 7.0 Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/general-entry-level-data-entry-7-0-solution/

Find me 1 hour long assesment for the below job at SHL Job Description Join a community that is shaping the future of work! SHL, People Science. People Answers. Are you a seasoned QA Engineer with a flair for innovation? Are you ready to shape the future of talent assessment and empower organizations to unlock their full potential? If so, we want you to be a part of the SHL Team! As a QA Engineer, you will be involved in creating and implementing software solutions that contribute to the development of our ground-breaking products. An excellent benefit package is offered in a culture where career development, with ongoing manager guidance, collaboration, flexibility, diversity, and inclusivity are all intrinsic to our culture. There is a huge investment in SHL currently so there's no better time to become a part of something transformational.		
	Automata Selenium | SHL	https://www.shl.com/solutions/products/product-catalog/view/automata-selenium/
What You Will Be Doing	Automata - Fix (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/automata-fix-new/
Getting involved in engineering quality assurance and providing inputs when required.	Automata Front End | SHL	https://www.shl.com/solutions/products/product-catalog/view/automata-front-end/
	JavaScript (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/javascript-new/
Create and develop test plans for various forms of testing.	HTML/CSS (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/htmlcss-new/
Conducts and/or participates in formal and informal test case reviews.	HTML5 (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/html5-new/
Develop and initiate functional tests and regression tests.	CSS3 (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/css3-new/
Rolling out improvements for testing and quality processes.	Selenium (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/selenium-new/
Essential	SQL Server (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/sql-server-new/
What we are looking for from you:	Automata - SQL (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/automata-sql-new/

Development experience – Java or JavaScript, CSS, HTML (Automation) Selenium WebDriver and page object design pattern (Automation) SQL server knowledge Test case management experience. Manual Testing Desirable Knowledge the basic concepts of testing Strong solution-finding experience Strong verbal and written communicator. Get In Touch Find out how this one-off opportunity can help you achieve your career goals by making an application to our knowledgeable and friendly Talent Acquisition team. Choose a new path with SHL. #CareersAtSHL #SHLHiringTalent #TechnologyJobs #QualityAssuranceJobs #CareerOpportunities #JobOpportunities About Us We unlock the possibilities of businesses through the power of people, science and technology. We started this industry of people insight more than 40 years ago and continue to lead the market with powerhouse product launches, ground-breaking science and business transformation. When you inspire and transform people's lives, you will experience the greatest business outcomes possible. SHL's products insights, experiences, and services can help achieve growth at scale.	Manual Testing (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/manual-testing-new/

What SHL Can Offer You Diversity, equity, inclusion and accessibility are key threads in the fabric of SHL's business and culture (find out more about DEI and accessibility at SHL) Employee benefits package that takes care of you and your family. Support, coaching, and on-the-job development to achieve career success A fun and flexible workplace where you'll be inspired to do your best work (find out more LifeAtSHL) The ability to transform workplaces around the world for others. SHL is an equal opportunity employer. We support and encourage applications from a diverse range of candidates. We can, and do make adjustments to make sure our recruitment process is as inclusive as possible. SHL is an equal opportunity employer.		
ICICI Bank Assistant Admin, Experience required 0-2 years, test should be 30-40 mins long	Administrative Professional - Short Form | SHL	https://www.shl.com/solutions/products/product-catalog/view/administrative-professional-short-form/
	Verify - Numerical Ability | SHL	https://www.shl.com/solutions/products/product-catalog/view/verify-numerical-ability/
	Financial Professional - Short Form | SHL	https://www.shl.com/solutions/products/product-catalog/view/financial-professional-short-form/
	Bank Administrative Assistant - Short Form | SHL	https://www.shl.com/solutions/products/product-catalog/view/bank-administrative-assistant-short-form/
	General Entry Level – Data Entry 7.0 Solution | SHL	https://www.shl.com/solutions/products/product-catalog/view/general-entry-level-data-entry-7-0-solution/
	Basic Computer Literacy (Windows 10) (New) | SHL	https://www.shl.com/solutions/products/product-catalog/view/basic-computer-literacy-windows-10-new/
KEY RESPONSIBITILES: Manage the sound-scape of the	Verify - Verbal Ability - Next Generation | SHL	https://www.shl.com/solutions/products/product-catalog/view/verify-verbal-ability-next-generation/

station through appropriate creative and marketing interventions to Increase or Maintain the listenership	SHL Verify Interactive - Inductive Reasoning	SHL	https://www.shl.com/solutions/products/product-catalog/view/shl-verify-interactive-inductive-reasoning/
Acts as an interface between Programming & sales team, thereby supporting the sales team by providing creative inputs in order to increase the overall ad spends by clients		
Build brand Mirchi by ideating fresh programming initiatives on air campaigns, programming led on-ground events & new properties to ensure brand differentiation & thus increase brand recall at station level		
Invest time in local RJs to grow & develop them as local celebrities		
Through strong networking, must focus on identifying the best of local talent and ensure to bring the creative minds from the market on board with Mirchi		
Build radio as a category for both listeners & advertisers		
People Management		
Identifying the right talent and investing time in developing them by frequent feedback on their performance		
Monitor, Coach and mentor team members on a regular basis		
Development of Jocks as per guidelines		
Must have an eye to spot the local talent to fill up vacancies locally		
TECHNICAL SKILLS & QUALIFICATION REQUIRED:		
Graduation / Post Graduation (Any specialisation) with 8 -12 years of relevant experience		
Experience in digital content conceptualisation		
Strong branding focus		
Must be well-read in variety of areas and must keep up with the	Occupational Personality Questionnaire OPQ32r	SHL	https://www.shl.com/solutions/products/product-catalog/view/occupational-personality-questionnaire-opq32r/

latest events in the city / cluster / country Must know to read, write & speak English PERSONAL ATTRIBUTES: Excellent communication skills Good interpersonal skills People management Suggest me some tests for the above jd. The duration should be at most 90 mins		