



## **GENERAL INSTRUCTIONS:**

1. Read all instructions carefully before attempting.
3. Use of AI tools and frameworks is encouraged.
4. Submit your solution within the given time limit.
5. Code should be well-documented and explainable.

## **Q.1 PROBLEM STATEMENT**

**Design an LLM-Powered Intelligent Query-Retrieval System** that can process large documents and make contextual decisions. Your system should handle real-world scenarios in insurance, legal, HR, and compliance domains.

### **Input Requirements:**

- Process PDFs, DOCX, and email documents
- Handle policy/contract data efficiently
- Parse natural language queries

### **Technical Specifications:**

- Use embeddings (FAISS/Pinecone) for semantic search
- Implement clause retrieval and matching
- Provide explainable decision rationale
- Output structured JSON responses

### **Sample Query:**

*"Does this policy cover knee surgery, and what are the conditions?"*

## Q.2 SYSTEM ARCHITECTURE & WORKFLOW

**2.1)** Design and implement the following system components:

1

### Input Documents

PDF Blob URL

2

### LLM Parser

Extract structured query

3

### Embedding Search

FAISS/Pinecone retrieval

4

### Clause Matching

Semantic similarity

5

**Logic Evaluation**

Decision processing

6

**JSON Output**

Structured response

### Q.3 EVALUATION PARAMETERS

**3.1)** Your solution will be evaluated based on the following criteria:

**a Accuracy**

Precision of query understanding and clause matching

**b Token Efficiency**

Optimized LLM token usage and cost-effectiveness

**c Latency**

Response speed and real-time performance

d

**Reusability**

Code modularity and extensibility

e

**Explainability**

Clear decision reasoning and clause traceability

## Q.4 RETRIEVAL SYSTEM API DOCUMENTATION

**Base URL (Local Development):**<http://localhost:8000/api/v1>**Authentication:**

Authorization: Bearer 94adf1bd4f8978d3029fd88cb36c7f95a255d331301920caa50830f5f6c3ba26

☒ Team token loaded successfully

### API Endpoints Overview

POST /hackrx/run

Run Submissions

**Sample Upload Request:**

POST /hackrx/run  
Content-Type: application/json

Accept: application/json

Authorization: Bearer 94adf1bd4f8978d3029fd88cb36c7f95a255d331301920caa50830f5f6c3ba26

```
{
  "documents": "https://hackrx.blob.core.windows.net/assets/policy.pdf?sv=2023-01-03&st=2023-01-03T10:31:00.0000000Z&sig=94adf1bd4f8978d3029fd88cb36c7f95a255d331301920caa50830f5f6c3ba26",
  "questions": [
    "What is the grace period for premium payment under the National Parivar Mediclaim?",
    "What is the waiting period for pre-existing diseases (PED) to be covered?",
    "Does this policy cover maternity expenses, and what are the conditions?",
    "What is the waiting period for cataract surgery?",
    "Are the medical expenses for an organ donor covered under this policy?",
    "What is the No Claim Discount (NCD) offered in this policy?",
    "Is there a benefit for preventive health check-ups?",
    "How does the policy define a 'Hospital'?",
    "What is the extent of coverage for AYUSH treatments?",
    "Are there any sub-limits on room rent and ICU charges for Plan A?"
  ]
}
```

### Sample Response:

```
{
  "answers": [
    "A grace period of thirty days is provided for premium payment after the due date.",
    "There is a waiting period of thirty-six (36) months of continuous coverage from the start of the policy.",
    "Yes, the policy covers maternity expenses, including childbirth and lawful medical expenses.",
    "The policy has a specific waiting period of two (2) years for cataract surgery.",
    "Yes, the policy indemnifies the medical expenses for the organ donor's hospitalization.",
    "A No Claim Discount of 5% on the base premium is offered on renewal for a one-year period.",
    "Yes, the policy reimburses expenses for health check-ups at the end of every block of 12 months.",
    "A hospital is defined as an institution with at least 10 inpatient beds (in towns with population less than 10,000) or 20 inpatient beds (in towns with population more than 10,000).",
    "The policy covers medical expenses for inpatient treatment under Ayurveda, Yoga, Naturopathy, Siddha, and Unani.",
    "Yes, for Plan A, the daily room rent is capped at 1% of the Sum Insured, and ICU charges are capped at 5% of the Sum Insured."
  ]
}
```

### Recommended Tech Stack:

#### FastAPI

Backend

#### Pinecone

Vector DB

#### GPT-4

LLM

**PostgreSQL**

Database

## Q.5 SCORING DOCUMENTATION

### Scoring System Explanation

#### 1. Document Types

- *Known Documents*: Publicly available
- *Unknown Documents*: Private & unseen

#### 2. Document-Level Weightage

- *Known Documents*: Low weightage (e.g., 0.5)
- *Unknown Documents*: High weightage (e.g., 2.0)

#### 3. Question-Level Weightage

- Each question may have its own weight (e.g., some are worth more due to complexity or importance).

#### 4. Score Calculation

- For each correct answer:  
 $\text{Score} = \text{Question Weight} \times \text{Document Weight}$
- Final score is the **sum of all such scores** across all documents.

### Example

#### Documents:

- *Doc A (Known)* – Weight: 0.5
- *Doc B (Unknown)* – Weight: 2.0

#### Questions:

Question	Document	Answered Correctly?	Question Weight	Score Contribution
Q1	Doc A	✓ Yes	1.0	$1.0 \times 0.5 = \mathbf{0.5}$
Q2	Doc A	✗ No	2.0	0
Q3	Doc B	✓ Yes	1.0	$1.0 \times 2.0 = \mathbf{2.0}$
Q4	Doc B	✓ Yes	2.0	$2.0 \times 2.0 = \mathbf{4.0}$

**Total Score:**

- *Doc A Contribution:* 0.5
- *Doc B Contribution:*  $2.0 + 4.0 = 6.0$
- **Final Score =  $0.5 + 6.0 = 6.5$**

**Key Points**

- Correct answers from **unknown documents** contribute more.
- **High-weight questions** boost your score significantly.
- **Incorrect or unattempted questions** contribute 0, regardless of weight.



**Note:** This is just an indicative method of scoring. The actual scoring system may vary based on final evaluation criteria.

## SUBMISSION INSTRUCTIONS

- **Submit your complete solution before the deadline**
- **Include proper documentation and code comments**
- **Ensure all requirements are met as per question specifications**
- **Test all API endpoints with sample data**

[Submit Solution](#)[View Problem Statement \(PDF\)](#)