Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	21 November 2023
Team ID	Team-612739
Project Name	Image caption generation
Maximum Marks	4 Marks

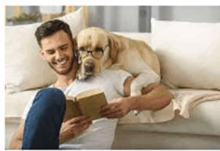**Technical Architecture for Image Caption Generation:**

Image-Text Retrieval: "The man in blue shirt is wearing glasses."

Guidelines:

- Include all the processes as application logic or technology blocks.
- Specify whether the system is deployed locally or in the cloud.
- Indicate external interfaces, such as third-party APIs.
- Identify data storage components or services.
- Indicate the integration with machine learning models, if applicable.

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	How users interact with the application (if any)	Web UI, Mobile App, etc.
2	Image Processing	Logic for image preprocessing and feature extraction	Python, OpenCV, etc.
3	Natural Language Processing	Logic for generating captions from features	Python, TensorFlow, PyTorch, etc.
4	Image Dataset	Data type and configurations for image storage	Local storage, cloud storage, etc.
5	Caption Database	Storage for generated captions	SQL database, NoSQL database, etc.
6	Cloud Infrastructure	Deployment on cloud or local system	AWS, Azure, Google Cloud, local servers, etc.
7	External API-1	External services for additional data (if any)	Image recognition API, Language translation API, etc.

S.No	Component	Description	Technology
8	Machine Learning Models	Models used for image caption generation	Pretrained image captioning models, etc.
9	File Storage	Storage requirements for model checkpoints, data	Cloud storage, local filesystem, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	List open-source frameworks used in the system	TensorFlow, PyTorch, OpenCV, etc.
2	Security Implementations	Describe security and access controls implemented	Encryption, authentication, authorization, etc.
3	Scalable Architecture	Justify the architecture's scalability	Distributed computing, microservices, etc.
4	Availability	Describe how the application ensures availability	Load balancing, redundancy, failover mechanisms, etc.

S.No	Characteristics	Description	Technology
5	Performance	Design considerations for application performance	Caching, content delivery networks (CDNs), etc.