1) Project Reference Number: 46S_BE_4628
2) Title of the project:VIDEO SUMMARIZATION FOR CCTV FOOTAGE
3) Name of the College:COMPUTER SCIENCE AND ENGINEERING
4) Name of the Department:K.L.E. INSTITUTE OF TECHNOLOGY, HUBBALLI
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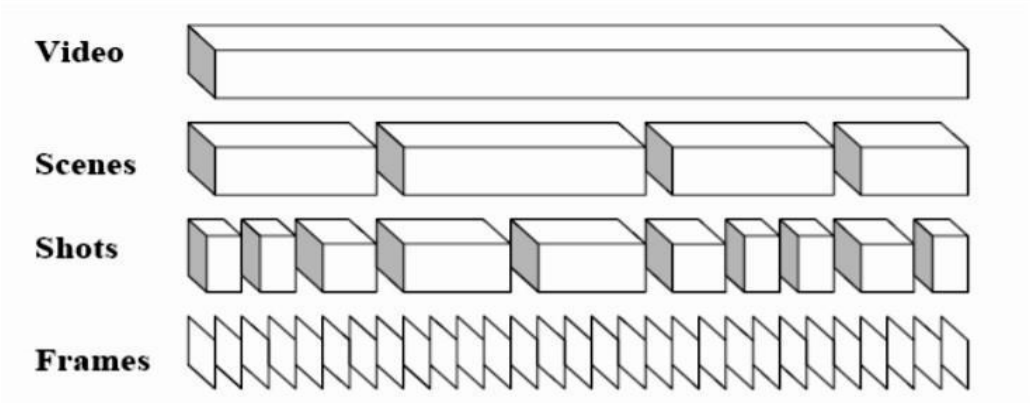
7) Introduction / background:
   - A Multiple Visual Models Based Perceptive Analysis Framework for Multilevel Video Summarization
   - Minimax Optimal Video Summarization
   - Video Summarization and Scene Detection by Graph Modeling
   - Video Summarization Using A Visual Attention Model
   - Automatic video Summarization
   - Query-Focused Extractive Video Summarization
   - Generating Summarizes of multi-episode video
   - A Novel Video Summarization Framework for Document Preparation and Archival Applications
   - Event Detection and Clustering for Surveillance Video Summarization
   - Video Summarization Using Singular Value Decomposition
8) Objectives :
   - Find the different format /type of CCTV footage as input video .
   - Identify and implement an efficient method for extracting the features of frames from the video input.
   - Utilize unsupervised machine learning techniques to group similar content.
   - Based on the clusters obtained develop a mechanism to detect the keyframes to generate a summary of the video.
9) Methodology:



- Preprocessing: Extract frames from the video .
- Feature extraction: Extract features from each frame, such as pixel intensity values, texture, and motion.
- Keyframe selection: Identify the frames that have the highest likelihood of being representative of the video content by calculating their distance. These frames are selected as keyframes.
- Shot selection: Select one or more representative keyframes from each shot to include in the video summary.
- Video summary generation: Generate a summary of the video by concatenating the selected keyframes from each shot in the order in which they appear in the video.
- End: Output the video summary.

10) Results and Conclusions :

The project's main objective is to create video summaries from CCTV data using a Python algorithm. The main conclusion of the experiment is that, compared to film recorded in wide spaces in sunny conditions, the algorithm performs better correctly for footage acquired in restricted locations. This study shows that the method may not be suitable for usage in areas with more changing illumination and ambient conditions, which has significant consequences for the practical use of the algorithm in real-world scenarios. The algorithm might not be able to properly analyse film shot in various contexts since it was either developed for or trained on closed environment material. Given that Python is being used, it is probable that the project will analyse and process the CCTV footage using machine learning or computer vision methods. In recent years, these methods have demonstrated considerable potential for the analysis of massive volumes of visual data, including photos and movies. However, the nature and attributes of the data being analysed have a significant impact on how well these strategies work. In this instance, the discovery that the algorithm performs better correctly for footage shot in a closed area emphasises the need of properly taking into account the surrounding circumstances and context of the material being analysed. In general, the project's emphasis on creating video summaries from CCTV data using Python and machine learning algorithms is an intriguing and perhaps fruitful field of research. The discovery that the algorithm works more correctly for footage shot in a confined area raises the possibility that more research may be required to enhance its performance in different contexts. However, the project's findings help us better grasp the difficulties and possibilities involved in analysing vast volumes of visual data from various contexts.

11) Scope for future work :

The current method of video summary has made a number of new avenues for study and development possible. Some possible improvements include increasing the precision of key frame recognition, which is essential for producing an accurate summary of the video material. This might be accomplished by including extra characteristics to rely on for key frame detection or by using more sophisticated computer vision algorithms. A further topic for future development is efficient background removal, which is crucial for determining the key-frames and assessing effective foreground motion. This might be accomplished by creating fresh approaches or improving current algorithms to better take into account changing illumination and environmental factors. Furthermore, because deep learning-based approaches have shown considerable promise in a range of computer vision applications, investigating them in key frame recognition is an interesting field for future research. It may be feasible to increase the accuracy and efficiency of video summarization even more by using these approaches. Overall, the current video summarising technique has shown encouraging results, but there is still opportunity for improvement and additional research. It may be able to progress the state-of-the-art in video summarization and uncover new possibilities for analysing and comprehending massive volumes of visual data by focusing on these prospective areas for future study and development.