



# HINDUSTHAN INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai, Accredited with "A" Grade by NAAC and Accredited by NBA (Aero, CSE, ECE & Mech.)

Valley Campus, Pollachi Main Road, Coimbatore 641 032.



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2022–2023 (Odd Sem)

### Innovations in Teaching Learning Process

Name of the Faculty	Dr. M. Thangamani
Subject code & Title	20CS512 & Information Retrieval
Academic year & Semester	2023-2024

#### 1. Project-Based Learning (PBL):

##### Objectives:

- Students work on real-world projects that involve collecting, analyzing, and interpreting data. This hands-on approach enhances practical skills and problem-solving abilities.
- Mimics real-world scenarios, promotes teamwork, and provides a tangible outcome.
- Students have opportunities to develop skills of observation, survey, research, reporting, presentation, communication, and collaboration with people involved, team building, and leadership in problem-solving approach of project based learning.

##### Process flow in Project-Based Learning:

Students will define the learning objectives and standards that the project will address and determine the key knowledge, skills, and competencies students should acquire. Choose a meaningful, authentic, and relevant problem and ensure that the problem aligns with the learning objectives and encourages critical thinking. Form teams to encourage collaboration and teamwork. Assign specific roles within each team to distribute responsibilities. Students will conduct research to gather information related to the project. Students will explore multiple resources, including books, articles, interviews, and online sources. Students will design solutions, create prototypes, or develop models. Faculty members will monitor progress and provide guidance as needed. Have students present their projects to an audience, whether it's classmates, teachers, parents, or the community and emphasize effective communication skills. Faculty members will assess both the process and the final product and provide feedback based on established criteria and learning objectives.

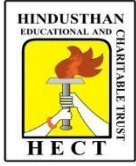
##### Outcomes of the Project Based Learning:

- Through hands-on projects, students can develop a more profound understanding of the subject matter compared to traditional learning methods.
- Projects are designed to be challenging, requiring students to think critically and solve problems. This helps in developing essential skills that are applicable beyond the classroom.

- By working on projects, students are often encouraged to think creatively and come up with innovative solutions.
- Projects usually involve presentations, reports, or other forms of communication to share findings. This helps in improving students' communication skills, both in writing and verbally.

**Mini Project Topic:** Effective Information Retrieval System  
Semantic Unstructured Data Retrieval System  
Web Page Optimization  
Website for Star Pharmacy

Samples:



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## **Effective Information Retrieval System**

### **A MINI PROJECT REPORT**

**Submitted by**

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In partial fulfillment for the award of the degree of

**BACHELOR OF TECHNOLOGY**

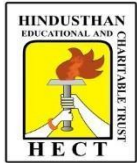
In

**Computer Science and Engineering**

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**OCTOBER 2023**



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## **Sematic Unstructured Data Retrieval System**

### **A MINI PROJECT REPORT**

**Submitted by**

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## 2. Case Studies:

### Objectives:

- Analyzing real-world case studies and use cases helps students understand how data analytics is applied in various industries.
- Offers context to theoretical concepts, encourages critical thinking, and helps students see the relevance of analytics in different domains.

### Process flow in Case Studies:

Students will be able to identify a relevant and interesting case that aligns with the objectives of the Case study. Clearly articulate the problem or research questions that the case study aims to address. Conduct a literature review to understand existing research and theories related to the case. Identify gaps in knowledge that the case study could potentially fill. Gather relevant data from various sources. Use a combination of methods, such as interviews, surveys, observations, and document analysis. Formulate hypotheses or key areas of investigation. Determine the type of case study (exploratory, explanatory, descriptive, or intrinsic). Choose data collection methods (interviews, surveys, observations, document analysis). Organize and analyze the data using appropriate analytical tools. Interpret the results in the context of the research questions or problem statement. Summarize the key findings and conclusions. Structure the report with an introduction, background, methodology, findings, discussion, and conclusion.

### Outcomes of the Case Studies:

- The case study may reveal specific problems, challenges, or issues within the subject under investigation.
- A case study provides a detailed and nuanced understanding of the case, offering insights into the complexities and intricacies of the situation.
- The case study might lead to the identification of best practices, lessons learned, or recommendations for individuals, organizations, or policymakers.
- The case study outcomes may demonstrate how theoretical concepts or frameworks can be applied in real-world situations, illustrating their practical relevance.
- If the case study was designed to test specific hypotheses, the outcomes will involve either the validation or refutation of these hypotheses based on the evidence collected.

### Case Study Question 1:

Classify the following dataset using SVM and predict the class label for the point (5,1) dataset

X1	X2	Y
4	2	1
4	-1	1
7	2	1
7	-1	1
2	1	-1
1	2	-1
-2	1	-1

### Case Study Question 2:

Classify the following dataset using SVM and predict the class label for the point (5,1) dataset.

X1	X2	Y
4	2	1
4	-1	1
7	2	1
7	-1	1
2	1	-1
1	2	-1
-2	1	-1

### Case Study Question 3:

Given the data in Table, reduce the dimension from 2 to 1 using the Principal Component Analysis (PCA) algorithm.

Feature	Example 1	Example2	Example3	Example 4
X	4	8	13	7
Y	11	4	5	14

### Solution:

Step 1:  
No. of features,  $n = 2$  (a, b)  
No. of samples,  $N = 4$  (sample1, sample2, sample3, sample4)

Step 2:  
calculating mean,  
 $\bar{a} = \frac{4+8+13+7}{4} = 8$   
 $\bar{b} = \frac{11+4+5+14}{4} = 8.5$

Step 3:  
calculating covariance matrix, between features,  
In the given dataset, ordered features are as,

