MY INTERSHIP AT CODSOFT

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My Internship at CODSOFT: AI Projects Journey

An internship report submitted by Ambuj Yadav (24/SCA/BCA/001) under the supervision of Dr. Ritu Sachdeva at Manav Rachna International Institute of Research and Studies for the partial fulfillment of Bachelor of Computer Applications (BCA).

About CODSOFT

Company Profile

CODSOFT is an IT Services and Consultancy company founded in 2022 and based in Kolkata, India. They specialize in providing innovative solutions in Web Development, App Development, and Data Science.

Internship Focus

CODSOFT focuses on practical, hands-on learning experiences for interns, guiding them through real-world projects under the mentorship of industry experts.

Company Vision

They are passionate about technology and believe in the power of software to transform the world, aiming to equip individuals with skills needed to succeed in tech fields.

Internship Objectives & Structure

Primary Objective

To enhance Artificial Intelligence skills by engaging in four structured projects, each reflecting a real-world problem, and improve knowledge of Python programming.

Supervision

The internship program was overseen by Dr. Ritu Sachdeva, who guided the progress and quality of each task.

Weekly Project Plan

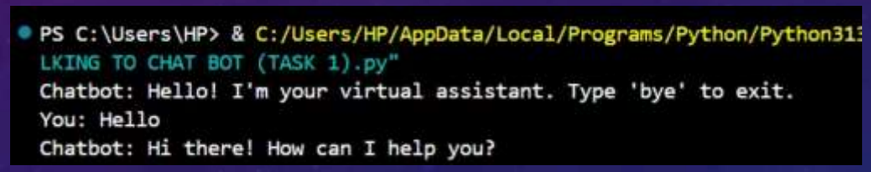
- Week 1: Talking to Chat Bot
- Week 2: TIC TAC TOE
- Week 3: Image Captioning
- Week 4: Recommendation Movie System
- Week 5: Face Detection

Progress was tracked through GitHub commits and milestone checklists.

Project 1: Simple Rule-Based Chatbot

Project Overview

A Simple Rule-Based Chatbot that can engage in basic conversations with users, similar to virtual assistants like Google Assistant.



GitHub: sergeantcross0007/CODSOFT-TASKS-Artificial-intelligence

Key Features

- Responds to greetings and basic questions
- Provides current time when asked
- Handles unknown queries gracefully
- Exits conversation when user types "bye"

Project 2: TIC TAC TOE AI

Game Implementation

Developed a TIC TAC TOE game using Python with an AI opponent that uses the Minimax Algorithm.

AI Decision Making

The AI looks ahead at all possible moves and simulates game progression assuming optimal play from both sides.

Scoring System

Assigns scores to outcomes: Win (+1), Loss (-1), Draw (0), and chooses the move that maximizes its minimum guaranteed score.

Project 3: Image Captioning AI

Technologies Used

Transformers: Python library from Hugging Face offering pre-trained models

Blip Processor: Formats images and text for the BLIP model

Tkinter: Python library for creating graphical user interfaces

Torch: Open-source machine learning library for building deep neural networks

ImageTK: Used to add images for captioning

Project 4: Recommendation Movie System

Project Overview

Developed a movie recommendation system using content-based filtering and collaborative filtering approaches.

Pandas (PD)

Library used for data analysis and recommendation, with a shorter alias (PD) for convenience.

TfidVectorizer

Python class that transforms raw text documents to a matrix of TfidVectorizer features.

Cosine Similarity

Measures similarity between movies by calculating the cosine of the angle between their feature vectors.

Project 5: Face Detection AI

Project Overview

Developed a face detection system using AI that works with a webcam to identify and highlight faces in real-time.

Technology Used

- CV2 (OpenCV): Popular library for machine learning and computer vision operations
- Face Cascade: Pre-trained classifier for face detection
- Video Capture: For accessing webcam feed

The system draws green square lines around detected faces and closes when the user presses the Q key.

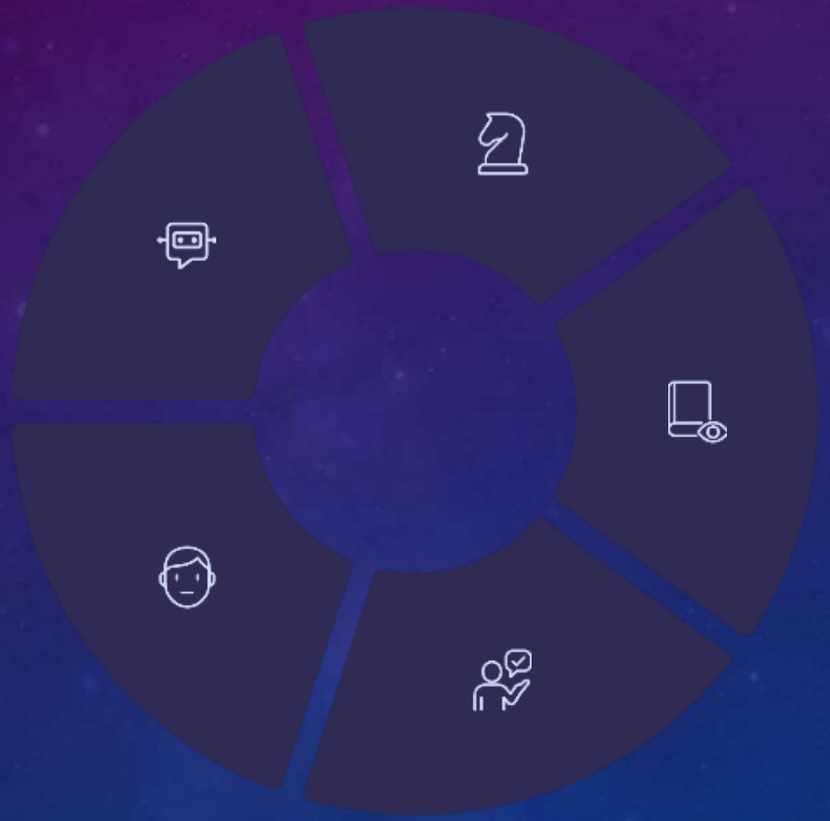
Learning Outcomes

Chatbot

Learned how chatbots process user queries, provide information, and simulate human-like conversation.

Face Detection

Mastered basic concepts of computer vision for real-world applications like security and image filtering.



TIC TAC TOE

Understood how AI can simulate human decision-making using algorithms like Minimax for perfect gameplay.

Image Captioning

Gained experience with computer vision and natural language processing for describing image content.

Movie Recommendations

Explored content-based and collaborative filtering methods for personalized suggestions.

Conclusion & Future Scope

Key Takeaways

This internship provided valuable hands-on experience with various AI technologies and Python programming. Each project addressed different aspects of artificial intelligence, from natural language processing to computer vision.

The practical knowledge gained through these projects has significantly enhanced my understanding of how AI can be applied to solve real-world problems.

Future Scope

- Enhance the chatbot with more advanced NLP capabilities
- Implement reinforcement learning in the TIC TAC TOE AI
- Improve image captioning with more sophisticated models
- Develop hybrid recommendation systems
- Extend face detection to include emotion recognition

THANK YOU