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Skill Set – We are looking:

1. Python & OOPs

2. Python Modules:

Web Scraping (requests, beautiful soup)

Regular Expressions (re), os, collections, string, math, random

3. Data Analysis & Visualization:

NumPy, Pandas, Matplotlib, Seaborn

4. SQL - Commands:

Query Writing, Window Functions, Nested Queries, Joins

5. Machine Learning with Scikit-learn:

Supervised Learning: Regression, Classification Models

Unsupervised Learning, Time Series, Reinforcement Learning

6. Python Libraries for Advanced Tasks:

OpenCV (cv2), Pillow, NLTK

7. Deep Learning with Neural Networks:

Artificial Neural Networks (ANN)

Convolutional Neural Networks (CNN)

Recurrent Neural Networks (RNN)

8. Word Embeddings & Transformers:

Word2Vec

Transformers (Encode, Decode, Encode-Decode)

9. Large Language Models (LLMs):

Deployment, Customization, Fine Tuning

Prompt Engineering

10. LangChain & Agents with CrewAI

Chatbot and Agents

11. Web Development:

HTML, CSS (Frontend)

Flask, Streamlit (App Development)

12. Cloud Deployment & Development:

Cloud Platforms (AWS, Azure, GCP)

Deployment Pipelines

Commitment & Goals

Commitment:

- Minimum duration: **1 Year**
- Attitude: **Willingness to learn and grow**

Focus Areas

We aim to master the following domains through focused efforts and collaboration:

Artificial Intelligence (AI):

- Machine Learning (ML)
- Deep Learning (DL)
- Natural Language Processing (NLP)
- Transformers
- Large Language Models (LLMs)
- AI Agents
- Chatbots

Plan & Execution

Project-Oriented Learning:

- **Goal:** Complete and document 100 projects across the above domains within the first 100 days.
- **Teamwork:** Work in teams of 2-3 members to encourage collaboration, skill-sharing, and efficiency.
- **Showcase:** Publish all project codes, documentation, and learnings on GitHub for transparency and skill demonstration.

Daily Updates & Progress:

- **Accountability:** Showcase daily progress and commitment through updates and logs.
- **Outcomes:** Demonstrate capabilities, dedication, and tangible deliverables every single day.

Resource Support

- Access to **high-performance resources** including computing power, GPUs, and cloud platforms.
- Resources will be allocated based on project requirements to ensure uninterrupted progress.

AI (Machine Learning- Deep Learning – NLP – Transformers – LLM and Agents) Projects

Machine Learning (ML) Projects

1. Supervised Learning

1. Predicting house prices using regression models.
2. Loan approval prediction using logistic regression.
3. Sentiment analysis on product reviews.
4. Spam email classification with Naive Bayes.
5. Diabetes risk prediction using classification models.

2. Unsupervised Learning

6. Customer segmentation using k-means clustering.
7. Market basket analysis using association rule mining.
8. Dimensionality reduction for data visualization.
9. Anomaly detection in IoT sensor data.
10. Music genre clustering using Gaussian Mixture Models (GMMs).

3. Time Series Analysis

11. Stock price prediction using ARIMA models.
12. Weather forecasting using seasonal decomposition.
13. Traffic flow prediction using SARIMA.
14. Energy consumption forecasting with Prophet.
15. Earthquake prediction using time series features.

4. Reinforcement Learning

16. Dynamic pricing for e-commerce using Q-learning.
17. Robot navigation in dynamic environments.
18. Real-time bidding systems for online ads.
19. Optimal resource allocation in cloud computing.
20. Playing simple games using SARSA.

Deep Learning (DL) Projects

1. Image Processing

1. Image classification with CNNs.
2. Object detection using YOLOv8.
3. Image colorization using autoencoders.
4. Super-resolution image enhancement with SRGAN.
5. Face recognition system with Siamese networks.

2. Natural Language Processing (NLP)

6. Text generation with LSTMs.
7. Neural machine translation using seq2seq models.
8. Named entity recognition using BiLSTMs.
9. Summarization using attention mechanisms.
10. Sentiment analysis with RNNs.

3. Audio Processing

11. Speech recognition using deep RNNs.
12. Sound event classification with CNNs.
13. Audio synthesis with WaveNet.
14. Multilingual speech-to-text system with Tacotron.

15. Emotion detection in speech using deep networks.

4. Generative Models

16. GAN-based image synthesis.
 17. Creating deepfakes using GANs.
 18. Generating artwork with VAE-GANs.
 19. Video-to-video translation using Pix2Pix.
 20. Style transfer for images with neural networks.
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Transformers Projects

1. Text Processing

1. Text summarization using T5.
2. Sentiment analysis using BERT.
3. Spam detection with DistilBERT.
4. Machine translation with MarianMT.
5. Named entity recognition with RoBERTa.

2. Text Generation

6. Creative writing with GPT-3.
7. Recipe generation using GPT.
8. AI-based code generation with Codex.
9. Automatic poetry creation with transformers.
10. Generating interview questions with GPT-4.

3. Multimodal Applications

11. CLIP for text-to-image alignment.
12. Vision-Language models for captioning.
13. Multimodal sentiment analysis with ViLBERT.
14. Zero-shot classification with XLM-R.
15. Multimodal learning for social media analysis.

4. Advanced NLP Tasks

16. Semantic search engine using Sentence Transformers.
17. Aspect-based sentiment analysis.
18. Document classification with XLNet.

19. Cross-lingual embeddings using mBERT.
 20. Topic modeling with transformers.
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Large Language Models (LLMs) Projects

1. Fine-Tuned Applications

1. Legal document generation with Llama-2.
2. Personalized learning assistant using GPT.
3. Custom AI for medical diagnosis.
4. Customer support automation for e-commerce.
5. FAQ generation from knowledge bases.

2. Creative Applications

6. Virtual storyteller using GPT-4.
7. Writing assistant for professional emails.
8. AI for generating screenplays.
9. Music lyric generation using ChatGPT.
10. Fantasy world creation with GPT-based models.

3. Domain-Specific LLMs

11. Financial report summarization.
12. Scientific paper paraphrasing.
13. Legal contract simplification.
14. Programming tutorial generation.
15. AI for language learning and tutoring.

4. Advanced LLM Uses

16. Multilingual conversational agents.
 17. LLM-based interactive quiz systems.
 18. News aggregation with sentiment tagging.
 19. Personal fitness and diet planner using LLMs.
 20. Building a domain-specific search engine.
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Agents Projects

1. Autonomous Systems

1. Virtual shopping assistant.
2. Smart home automation with multi-agents.
3. AI-powered traffic management system.
4. Autonomous drone navigation.
5. Disaster response simulation.

2. Game-Based Agents

6. Chess AI with AlphaZero techniques.
7. Real-time multiplayer gaming bots.
8. Intelligent agents for card games.
9. Strategic decision-making in MOBA games.
10. Simulation of cooperative board games.

3. Conversational Agents

11. AI-driven personal assistants like Jarvis.
12. Customer service automation for banking.
13. Healthcare query resolution agents.
14. Mental health counseling bots.
15. Knowledge navigator for FAQs.

4. Business-Oriented Agents

16. Stock trading bot using reinforcement learning.
17. AI-powered financial advisor.
18. Autonomous agents for market analysis.
19. Real estate agent assistant.
20. Negotiation agents for business contracts.