# ****Skill Tree Generation****

"Given a list of skills or courses, generate a structured skill tree showing progression or dependencies."

## Paid / Hosted Models:

| **Model** | **Provider** | **Strengths** |
| --- | --- | --- |
| **GPT-4 (o4 or o4-mini)** | OpenAI | Excellent reasoning and structuring. Can infer dependencies between skills. |
| **Claude 3 Sonnet/Opus** | Anthropic | Good for logic-heavy tree generation. Handles long documents if course details are extensive. |
| **Gemini 1.5** | Google | Strong for classification and structure mapping. |

## Open-Source / Free Models:

| **Model** | **Provider** | **Notes** |
| --- | --- | --- |
| **Mistral 7B / Mixtral** | Mistral | Can be prompted for simple tree generation. Needs strong context. |
| **LLaMA 3 8B/70B** | Meta | Use with good prompting or fine-tuning on skill-path examples. |
| **OpenRouter + Free GPT-J** | Varies | Suitable for lightweight prototype testing with simpler examples. |

# ****Evaluate Employee Skill (Based on Profile, Resume, Input, etc.)****

"Assess what a person knows or what skill level they might be at."

## Paid / Hosted Models:

| **Model** | **Provider** | **Strengths** |
| --- | --- | --- |
| **GPT-4-turbo** | OpenAI | Excellent summarization and evaluation from CV/resume/skill profiles. |
| **Claude 3 Opus** | Anthropic | Handles nuance in soft/hard skill evaluation well. |
| **Cohere Rerank / Embed** | Cohere | Good for similarity-based evaluations. |

## Open-Source / Free Models:

| **Model** | **Strengths** |
| --- | --- |
| **BERT / RoBERTa + Classifier** | Use for skill extraction and categorization. |
| **LLaMA 3 + sentence-transformers** | Can classify and rate user input if fine-tuned or paired with embeddings. |

# ****Analyze Learning Progress in the Past****

"Given learning logs, assignments, course completions, infer trends and strengths/weaknesses."

## Paid / Hosted Models:

| **Model** | **Provider** | **Strengths** |
| --- | --- | --- |
| **GPT-4 or Claude 3** | OpenAI / Anthropic | Strong at interpreting structured + unstructured logs. |
| **Azure OpenAI + Cognitive Search** | Microsoft | Combine logs with powerful search indexing. |
| **Gemini 1.5 Pro** | Google | Great for cross-referencing logs over time. |

## Open-Source / Free Models:

| **Model** | **Use Case** |
| --- | --- |
| **Time-series models (Prophet, ARIMA, LSTM)** | For trends and forecasting. |
| **Langchain + Local LLM (Mistral / LLaMA)** | Analyze unstructured progress notes. |
| **Pandas + rule-based heuristics** | Basic KPI and metric tracking. |

# ****Monitoring Learning Progress (Live + Trends)****

"Track user engagement, completion rates, time spent, etc., in real-time or over time."

## Paid / Hosted Models:

| **Model** | **Purpose** |
| --- | --- |
| **GPT-4 / Claude / Gemini** | Insightful narrative summaries or alerts (e.g., “User is falling behind”). |
| **Vertex AI / Azure ML Studio** | For automating model training on engagement data. |
| **AWS Bedrock + Redshift + Kendra** | Strong for integrated monitoring with data lakes. |

## Open-Source / Free Models:

| **Model** | **Purpose** |
| --- | --- |
| **Grafana + Prometheus + InfluxDB** | Visualization and real-time monitoring of engagement stats. |
| **Scikit-learn / XGBoost** | For dropout prediction, progress clustering. |
| **OpenTelemetry + Langchain agent** | Can observe and act on behavior patterns. |