Here is a study guide based on the provided context:

Main Headings / Sub-headings

* **Artificial Intelligence (AI)**
  + Definition
  + Characteristics
  + Applications
* **Machine Learning (ML)**
  + Definition
  + Characteristics
  + Applications
* **Relationship between AI and ML**
  + How ML can be used to help solve AI problems
* **Limitations of Machine Learning**
  + Noise in training data
  + Insufficient features

Definitions, Characteristics, Applications

* **Artificial Intelligence (AI)**: AI is a field that focuses on creating systems that can take optimal decisions based on available information. AI formalizes decision processes, distinguishing between agents and the environment, and aims to exhibit functionally desirable behavior.
* **Machine Learning (ML)**: ML is a subset of AI that focuses on fitting functions to given data. ML aims to learn from data and make predictions or decisions based on that data.

Characteristics of ML:

* **Function approximation**: ML involves approximating a function that maps input data to output data.
* **Learning from data**: ML involves learning from data to make predictions or decisions.
* **Interactive decision process**: ML can be used to help solve AI problems, but ML itself is not an interactive decision process.

Applications of ML:

* **Image recognition**: ML can be used to recognize images, such as street signs.
* **Sentiment analysis**: ML can be used to classify text as positive or negative, such as classifying course reviews.

Examples and Diagram Suggestions

* **Image recognition**: ASCII diagram of a neural network used for image recognition:

```
  +---------------+
  |  Input Image  |
  +---------------+
          |
          |
          v
  +---------------+
  |  Convolutional  |
  |  Layer        |
  +---------------+
          |
          |
```

```
        v
  +---------------+
  |  Fully Connected |
  |  Layer         |
  +---------------+
        |
        |
        v
  +---------------+
  |  Output        |
  |  (Street sign)  |
  +---------------+
```

* **Sentiment analysis**: ASCII diagram of a decision tree used for sentiment analysis:

```
  +---------------+
  |  Course Review  |
  |  (Input Text)  |
  +---------------+
        |
        |
        v
  +---------------+
  |  Tokenize Text  |
  |  individual words |
  +---------------+
        |
        |
        v
  +---------------+
```

```
  |  Calculate Sentiment|
  |  (Positive or  |
  |  Negative)    |
  +---------------+
```

Elaboration

Machine Learning (ML) is a subset of Artificial Intelligence (AI) that focuses on fitting functions to given data. ML aims to learn from data and make predictions or decisions based on that data. While ML can be used to help solve AI problems, ML itself is not an interactive decision process. ML has limitations, such as noise in training data and insufficient features.

Summary of Key Points:

* AI focuses on creating systems that take decisions based on available information.
* ML is a subset of AI that focuses on fitting functions to given data.
* ML has limitations, such as noise in training data and insufficient features.

Flashcards:

Q: What is Artificial Intelligence (AI)?

A: AI is a field that focuses on creating systems that take optimal decisions based on available information.

Q: What is Machine Learning (ML)?

A: ML is a subset of AI that focuses on fitting functions to given data.

Q: What are some limitations of Machine Learning?

A: Noise in training data and insufficient features.