- **AWS Rekognition**: Understand capabilities for image analysis (e.g., object detection, facial recognition).
    - Able to extract key details of images
        - Label detection- detects common items in pictures
        - Image properties- things like color, brightness, and sharpness
        - Image moderation- categorizes risks in the image and categorizes each feature of the image
        - Facial analysis- able to generate general information about gender, age, mood, and facial accessories
        - Celebrity recognition- able to detect if a celebrity is in an image
        - Text in image- able to take out words within an image and store that as data
- **AWS Textract**: Learn about text and data extraction from scanned documents.
    - **Analyze document**- able to withdraw all data and numbers from the document, but does not organize it in a readable manner
    - Analyze expense- able to take out major information from a receipt, categorize it, and store the proper data in there
    - Analyze id- take out all key information from the ID, creates the categories for the data on the ID, and stores proper data in the results
    - Analyze lending- take out all data from a paystub and store them in the proper categories to be saved where you need it
- **AWS Comprehend**: Explore features for text analysis (e.g., sentiment analysis, entity recognition).
    - Automatically extract key phrases, entities, sentiment, language, syntax, topics and document classifications.
        - **Entities** – References to the names of people, places, items, and locations contained in a document.
        - **Key phrases** – Phrases that appear in a document. For example, a document about a basketball game might return the names of the teams, the name of the venue, and the final score.
        - **Personally Identifiable Information (PII)** – Personal data that can identify an individual
        - **Language** – The dominant language of a document.
        - **Sentiment** – The dominant sentiment of a document, which can be positive, neutral, negative, or mixed.
        - **Targeted sentiment** – The sentiments associated with specific entities in a document. The sentiment for each entity occurrence can be positive, negative, neutral or mixed.

        - **Syntax** – The parts of speech for each word in the document.
    - Accepts text documents, image files, PDF files, and word files as input
    - Works with other AWS services like Amazon S3, AWS KMS, and AWS Lambda. Store your documents in Amazon S3, or analyze real-time data with Firehose. Support for AWS IAM makes it easy to securely control access to Amazon Comprehend operations.
    - Examples:
        - Find documents about a subject: Scan a set of documents to determine the topics discussed, and to find the documents associated with each topic. You can specify the number of topics that Amazon Comprehend should return from the document set.
        - Find out how customers feel about your products: Send each customer comment to the DetectSentiment operation and it will tell you whether customers feel positive, negative, neutral, or mixed.
        - Discover what matters to your customers: Use Amazon Comprehend topic modeling to discover the topics that your customers are talking about on your forums and message boards, then use entity detection to determine the people, places, and things that they associate with the topic.
- **AWS Translate**: Discover how to translate text into different languages.
    - Amazon Translate is great for performing both batch translation when you have large quantities of pre-existing text to translate and real-time translation when you want to deliver on-demand translations of content
    - Can work with unstructured text documents or to build applications that work in multiple languages
    - Examples:
        - Multilingual user experience: Integrate Amazon Translate into your applications to enable multilingual user experiences
        - Language independent processing: Use Amazon Translate as part of your company's workflows to process data in many languages
        - Document translation: Quickly translate large volumes of content stored in databases or object storage
        - Internal and external communications: Make it easy for your customers and employees to communicate in their language of choice
    - How it works with other tools:

        - Extract named entities, sentiment, and key phrases from unstructured text, such as social media streams with **Amazon Comprehend.**
        - Make subtitles and live captioning available in many languages with **Amazon Transcribe**.
        - Translate document repositories stored in **Amazon S3**.
        - Seamlessly integrate workflows with **AWS Lambda** or **AWS Glue**.
- **AWS Macie**: Investigate how to identify and protect sensitive data.
    - **What it does**
        - Uses ML and pattern matching to identify sensitive data requiring protection
        - Supports many types of regulations regarding PII data (GDPR) and machine learning is used to discover certain patterns that the data can be hidden on
        - Enables construction of a map of your sensitive data and provides bucket-level protections and access controls
    - **Data Pipeline Use Case**
        - AWS Macie can be utilized during the data ingestion stage of a data pipeline for proper detection of sensitive data and a validation of whether it has been protected according to specific patterns and regulations
        - AWS Macie can also be used continuously in the pipeline, especially at the bucket level where sensitive data discovery is summarized on a scheduled basis
- **AWS Bedrock**: Explore generative AI models for creating personalized content.
    - **What it does**
        - Centralizes leading foundation models, large deep learning neural networks, from a variety of AI companies via an API
        - Customize the foundation models with your own data needs
        - Serverless – ease of integration and deployment
        - Input from user and bedrock searches knowledge bases
    - **Data Pipeline Use Case**
        - Extract crucial information via text summarization
        - Generate text data and other content
        - Use virtual assistant to fulfill requests and get information from dialogue input

- **AWS Transcribe**: See how Amazon Transcribe creates a text copy of speech in real time
    - Amazon Transcribe is an automatic speech recognition service that uses machine learning models to convert audio to text.
    - You can transcribe media in real time (streaming) or you can transcribe media files located in an Amazon S3 bucket (batch).

Develop Use Cases: Each group will brainstorm and develop use cases for integrating the AI services into a data pipeline or solution architecture.

Design the Solution Architecture: Draft an architecture diagram that includes the selected AI services and their integration into a data pipeline. Consider components such as data ingestion, processing, storage, and visualization.