**General Questions on Sentiment Analysis**

**1. What is the main goal of sentiment analysis?**

✔ The goal is to **analyze text data and determine whether the sentiment is positive, negative, or neutral**. It helps businesses understand customer emotions and improve their services.

**2. Why is sentiment analysis important in business?**

✔ It helps businesses:

* **Identify customer pain points** quickly.
* **Improve products and services** based on feedback.
* **Monitor brand reputation** on social media.

**3. What are the challenges in sentiment analysis?**

✔ The main challenges include:

* Understanding **sarcasm and irony** (e.g., *"Wow, great service... not!"*).
* Handling **ambiguous words** (e.g., *"The movie was bad, but the acting was amazing."*).
* Processing **different languages and slang** (e.g., informal words in social media comments).

**4. What are the common sentiment categories used in analysis?**

✔ The most common categories are:

* **Positive** – Happy or satisfied customers.
* **Negative** – Complaints or dissatisfaction.
* **Neutral** – Informational or mixed opinions.

**5. How does sentiment analysis improve customer experience?**

✔ It helps businesses quickly respond to customer concerns, leading to **better service, product improvements, and personalized marketing strategies**.

**Technical Questions on Machine Learning Models**

**6. What machine learning algorithms are used for sentiment analysis?**

✔ Some commonly used algorithms include:

* **Naïve Bayes** – Simple but works well for text classification.
* **Support Vector Machines (SVM)** – Good for high-dimensional text data.
* **Recurrent Neural Networks (RNNs) & LSTMs** – Used for analyzing sequential data like reviews.
* **BERT (Bidirectional Encoder Representations from Transformers)** – Best for understanding context and sarcasm.

**7. Which model did you use and why?**

✔ We used **BERT** because:

* It understands the **context of words better than traditional models**.
* It performs well on **short and long sentences**.
* It **detects sarcasm and complex sentiments more accurately**.

**8. What is Natural Language Processing (NLP)?**

✔ NLP is a field of AI that helps machines **understand, interpret, and process human language**. It includes tasks like **text tokenization, sentiment detection, and language translation**.

**9. What is the role of tokenization in sentiment analysis?**

✔ Tokenization is the process of **splitting text into words or phrases** so that they can be analyzed individually. It helps in **removing unnecessary elements like punctuation** and focuses only on meaningful words.

**10. What is the difference between supervised and unsupervised learning in sentiment analysis?**

✔ **Supervised Learning:** Uses **labeled datasets** (e.g., reviews tagged as "Positive" or "Negative") to train models.  
✔ **Unsupervised Learning:** Does not use labeled data and relies on clustering or topic modeling to detect patterns.

**Evaluation Metrics Questions**

**11. What metrics do you use to evaluate the sentiment analysis model?**

✔ We use:

* **Accuracy** – Measures how many predictions are correct.
* **Precision** – Shows how many predicted positives were actually correct.
* **Recall** – Shows how well the model identifies all actual positives.
* **F1-score** – Balances precision and recall for better evaluation.

**12. Why is accuracy not always the best metric?**

✔ Accuracy can be misleading in **imbalanced datasets**. For example, if **90% of reviews are positive**, a model predicting "positive" all the time will have 90% accuracy but will fail to detect negative sentiments.

**13. What is the F1-score, and why is it important?**

✔ The **F1-score** is the harmonic mean of **precision and recall**. It is useful when dealing with **imbalanced datasets**, ensuring that both **false positives and false negatives** are minimized.

**Real-World Applications & Use Cases**

**14. How can sentiment analysis be used in social media monitoring?**

✔ It helps brands track **public opinions, customer complaints, and emerging trends** on platforms like Twitter, Facebook, and Instagram.

**15. How does sentiment analysis help e-commerce businesses?**

✔ It allows companies like Amazon to **analyze customer reviews** and improve product recommendations based on user sentiment.

**16. How can banks use sentiment analysis?**

✔ Banks can analyze **customer complaints and feedback** to improve services like loan approvals, customer support, and fraud detection.

**Tools & Technologies Questions**

**17. What tools did you use for sentiment analysis?**

✔ We used:

* **Python** – Programming language for ML development.
* **NLTK (Natural Language Toolkit)** – For text preprocessing.
* **TensorFlow & PyTorch** – For deep learning model training.
* **BERT Model** – For accurate sentiment classification.

**18. Why did you choose Python for this project?**

✔ Python has **powerful libraries for NLP and machine learning**, making it ideal for sentiment analysis.

**19. What is TensorFlow, and why is it used?**

✔ TensorFlow is an **open-source AI framework** used to build and train deep learning models, including NLP tasks like sentiment analysis.

**20. What database did you use to store customer reviews?**

✔ We used **MongoDB (NoSQL database)** because it efficiently handles **unstructured text data**.

**Deployment & Business Impact**

**21. How can this sentiment analysis model be deployed?**

✔ The model can be deployed as a **web application or API**, allowing businesses to analyze real-time reviews.

**22. How can sentiment analysis be integrated into customer service chatbots?**

✔ Chatbots can use sentiment analysis to **detect angry customers and escalate issues to human agents**.

**23. How does real-time sentiment analysis work?**

✔ It continuously **monitors incoming reviews and classifies them instantly**, allowing businesses to react quickly.