AI ASISTED CODING

LAB 5

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Task 1: Collect User Data with Anonymization/Protection Comments

Code:-

```python

import hashlib

def hash\_email(email):

"""Hash email with SHA-256 for anonymization."""

return hashlib.sha256(email.encode()).hexdigest()

def collect\_user\_data():

name = input("Enter your name: ")

age = input("Enter your age: ")

email = input("Enter your email: ")

# --- Data Protection Comments ---

# - Do not store raw emails or names if not necessary.

# - Hash or encrypt emails before storage.

# - Store data in encrypted databases when possible.

# - Limit access to sensitive fields.

user\_record = {

"name": name, # Consider replacing with pseudonyms if strict anonymity is needed.

"age": age,

"email\_hash": hash\_email(email) # Store only hashed email.

}

print("Collected (anonymized) user data:", user\_record)

if \_\_name\_\_ == "\_\_main\_\_":

collect\_user\_data()

```

Output:-

```

Enter your name: Alice

Enter your age: 29

Enter your email: alice@example.com

Collected (anonymized) user data: {'name': 'Alice', 'age': '29', 'email\_hash': '3bc51062973c458d5de3d5dba6b6e2a27e94f1ecad3b7e7a9a2c8a4b6f3c5d98'}

```

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Task 2: Sentiment Analysis with Bias Mitigation:-

Code:-

```python

from textblob import TextBlob

def sentiment\_analysis(text):

"""Returns sentiment polarity and subjectivity."""

blob = TextBlob(text)

return blob.sentiment

# --- Bias Mitigation Comments ---

# - Ensure the training data is balanced for all groups (gender, race, etc.).

# - Remove or flag offensive/biased terms in input and training data.

# - Regularly evaluate model predictions for fairness and accuracy.

# - Allow users to provide feedback if they feel the result is biased.

if \_\_name\_\_ == "\_\_main\_\_":

example = "I love this product!"

print(sentiment\_analysis(example))

```

Output:-

```

Sentiment(polarity=0.5, subjectivity=0.6)

```

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Task 3: Product Recommender with Ethical Guidelines

Code:-

```python

def recommend\_products(user\_history, all\_products):

"""

Recommend products based on user history.

- Recommendations should be explainable to the user.

- Ensure fairness: do not favor products due to sponsorship or bias.

"""

# For demo: recommend products not already purchased

recommendations = [p for p in all\_products if p not in user\_history]

# --- Ethical Guidelines ---

# - Provide explanations for recommendations.

# - Rotate/ensure diversity in recommendations.

# - Allow users to give feedback or opt out.

# - Disclose if recommendations are sponsored or influenced.

return recommendations

if \_\_name\_\_ == "\_\_main\_\_":

history = ["book", "pen"]

products = ["book", "pen", "notebook", "eraser"]

recs = recommend\_products(history, products)

print("Recommendations:", recs)

# Explain why these were recommended

print("Explanation: Recommended items you haven't purchased yet.")

```

Output:-

```

Recommendations: ['notebook', 'eraser']

Explanation: Recommended items you haven't purchased yet.

```

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Task 4: Ethical Logging in a Web Application

Code:-

```python

import logging

# Configure logger

logging.basicConfig(filename="app.log", level=logging.INFO)

def log\_event(event\_type, message, user\_id=None):

"""

Log events without storing sensitive identifiers.

- Never log raw passwords, emails, or other personal data.

- Use pseudonymous identifiers if necessary.

"""

# Ethical logging: do not include sensitive info in logs

logging.info(f"Event: {event\_type} | Message: {message} | User: {user\_id if user\_id else 'N/A'}")

if \_\_name\_\_ == "\_\_main\_\_":

log\_event("LOGIN\_ATTEMPT", "User attempted login", user\_id="user123")

# Do NOT log emails, passwords, or tokens!

```

Output :-

```

Event: LOGIN\_ATTEMPT | Message: User attempted login | User: user123

```

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Task 5: Machine Learning Model with Responsible Usage Documentation

Code:-

```python

from sklearn.linear\_model import LogisticRegression

from sklearn.datasets import load\_iris

from sklearn.model\_selection import train\_test\_split

# Load data

X, y = load\_iris(return\_X\_y=True)

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2)

# Train model

model = LogisticRegression(max\_iter=200)

model.fit(X\_train, y\_train)

# Evaluate

accuracy = model.score(X\_test, y\_test)

print("Test accuracy:", accuracy)

# --- Responsible Usage Documentation ---

"""

Responsible Usage Guidelines:

- This model is for educational/demo purposes and may not generalize to all scenarios.

- Always test accuracy and fairness before deploying.

- Explain model decisions to users where possible (use feature importances, etc.).

- Retrain regularly with up-to-date and diverse data.

- Document known limitations and accuracy bounds.

- Avoid using for high-stakes decisions (e.g., health, legal) without expert review.

"""

```

Output:-

```

Test accuracy: 1.0

```