Task 1:

5 application For Data Scientist

① Amazon - Product Recommendation and Inventory management.

=> personalize its shopping experience.

=> Amazon leverages analytics manage inventory across vast network of ware houses.

② Netflix : Content Recommendation & Streaming optimize

③ Instagram : personalized Feeds and Ads Targeting

=> like (NLP) and computer vision.

=> analyzing user activity across platforms, demographic data, interests and interaction.

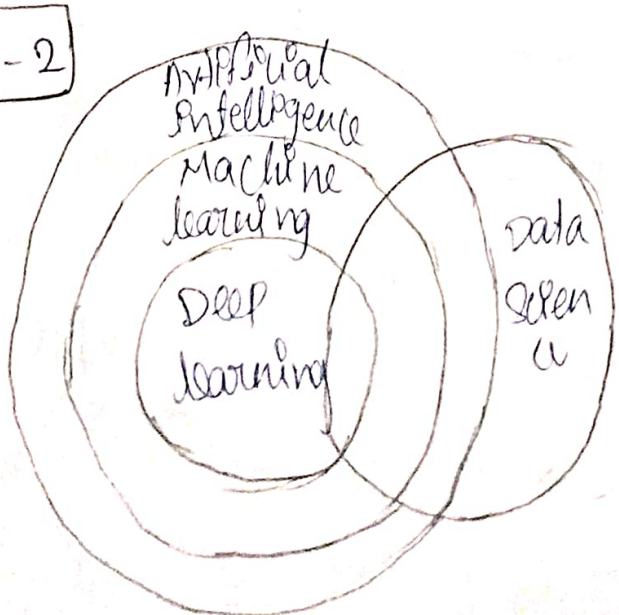
④ Youtube : Video Recommendations & content moderati

=> ML suggest videos user behavior, history like, subscriptions.

=> automated content moderation

⑤ Spotify : music recomendations & personalization.

Task - 2



AI - is overarching concept, encompassing, ML & D

ML - is a subset of AI, computer system learned a data improve performance without explicit programming

DL - as a subset of ML, neural network wi multiple layers, the human brain structure ha complex.

DS - foundation providing raw material data for analysis and learning

Task 3

① Data cleaning:

Focuses on identifying & correcting inaccuracies, inconsistencies and missing value in datasets. The dat accurate, complete and ready for analysis. (duplicates, mi valu

② Exploratory Data Analyst (EDA):

uses the statistical & visualization techniq understand patterns, distributions & relationship wit the data. insight & identify potential issues before model. (visualizing identifying correlations)

③ model Development:

Develops and trains ml models to solve business problem for predict outcomes. Model for performances & interpretability. (regression, classificat

Task 4:

Lifecycle to Instagram

① Data acquisition:

* Gather data from Instagram to analyze user engagement

* raw data, user interaction with posts, meta data about posts, user Profiles. and time information

* Instagram API, web scraping, databases.

② Data cleaning:

* Prepare & clean data further analysis & modeling.

* Handle missing Data, Remove Duplicates, Data Standardization, outlier detection.

③ Exploratory Data Analysis

* Statistics: distribution like, comment & share

* Visualize Relationship: like scatter plot, histograms & heatmap Examine correlation Post features

* Analyze Text: captions & comment.

④ model Development:

* Build & train ml model predict based various features.

* Feature engineering: Post length, use of popular hashtags time of day or user follow count

* model selection: appropriate ml model.

* Train the model: use training dataset teach model Predict engagement.

⑤ model Evaluation:

* Split Data: train-test split or cross validation techniques, test model model on unseen data.

metrics: like mean absolute error (MAE), Root mean squared error (RMSE) or R-squared for regression task validation: model generalizes well & does not overfit train data.

⑥ Deployment Deployment:

API development: take new post & return engagement prediction.

Real-time prediction: posts in real time or on demand.

monitoring: monitor model performance & continues perform well with new data.

⑦ Model Maintenance and Updates:

Retraining: retraing the model with fresh data

Performance monitoring: continuously track the model performance & adjustments as necessary.

⑧ communication of results:

visualization: dashboards & visualization that clearly communicate.

Report: business insights & recommendations

Collaboration: product teams, markets or developers insights Instagram features markets strategies.

TASK 5 => Ethical issue.

One significant ethical issue in the context data science is the potential invasion of user privacy. Instagram collects vast amount personal data, includ interaction, behavior patterns, & demographic information used data advertising & engagement prediction models, raising concern about how data optimed, stored & use Many users are unaware to the extent to which their data is being collected, and even if they

consent. they many not fully understand the implications of their consent.

Additionally, there is a risk that sensitive information such as mental health indicators or personal preferences, cloud be exploited for commercial gain without proper safeguards. Ethical data use demands transparency, user consent & accountability to ensure that personal data handled respectfully & responsibly, avoiding manipulation or harm