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COURSE : BCA C.S

SECTION - A

DATA DRIVEN

DECISION

MAKING

ASSIGNMNT - 1

Introduction to Data - Driven Decision Making

Task-1 Real world Scenario Where Decisions are Made using Data In Modern Healthcare Hospitals Use Data -Driven Making To reduce patient Readmission Rates For example q Hospitals analyzes electronic Health Records (EHR) , Historical admission Data lab Results and Socio - Demographic Information to identify High risk patients likely to be Readmitted Within 30 Days Using predictive Models (e.g., LACD index or Machine learning algorithms) Clinicians Receive Risk Scores And early Intervention Recommendation Such as follow up calls , Medication Reconciliation or Home - Care Arrangements This Data -Informed approach Has Reduced Readmission Rates by 15 - 30% in Many U.S Hospitals under the Medicare Hospital Readmission Reduction Program

Task-2 Compare and Contrast Descriptive predictive and prescriptive Models

Aspect	Descriptive Models	Predictive Models	Prescriptive Models
Purpose	Tell "What Happened"	Forecast What will Happen"	Recommend "What Should be Done"
Time Orientation	Past	future (probabilistic based)	future (action oriented.)
Output	Summaries reports Dashboards	Prediction, Scores Probabilities	Optimized Decisions Recommendations
Example	Monthly Sales Report showing Revenue by Region	Customer Churn model predicting who will leave next Month	Billing optimization engine that suggests the best price to Maximize profit while Retaining Customers
Techniques	Aggregations averages Dashboards	Regression Machine Learning time series	Optimization Simulation Decision trees Reinforcement learning
Decision impact	Awareness and Diagnosis	Forecasting and Planning	Direction and Improvement

Task - 3

Internal and external Date Sources [Company : Starbucks] Internal Date Sources

1. Point -of - Sale (Pos) Transaction Date
2. Starbucks Rewards loyalty program Database
3. Inventory and supply chain management systems
4. Employee scheduling and HR Records
5. Store - level CCTV and foot traffic sensors

External Data Sources

1. Weather Data (temperature, Precipitation)
2. Local event Calendars and traffic Date
3. Social Media sentiment and mentions (Twitter, Instagram)
4. Demographic and income Date from census bureaus
- 5) Competitor pricing and promotions (Scraped or third party providers)

Task-4: Reflection on adopting a Data Driven approach

An Data Driven mindset replaces intuition and Hierarchy with evidence, leading to High accuracy Reduced bias and faster iteration. In business it minimizes Costly mistakes (e.g launching unwanted products)

P: In daily life individuals who track Fitness spending or sleep Date Make objectively better choices than those relying on feeling alone. The key benefit is Continuous Learning: Every Decision generates new Date Creating a Virtuous virtuous feedback cycle that Compounds advantage over time



ASSIGNMENT - 2

Fundamentals of Data Collection and Cleaning

Task - 1

Survey Design and Collected responses
Survey Title Student Satisfaction Survey - [Your College Name] 2025

1. Year of student satisfaction study: 1st 2nd 3rd 4th
2. Overall Satisfaction with the College [1-10]
3. How satisfied are you with teaching quality
(Very Dissatisfied - Very Satisfied)
4. How satisfied are you with library and lab facilities? (5-point Scale)
5. How easy is it to reach faculty outside class? (5 point Scale)
6. How would you rate job placement and career support? (1-10)
7. Do you feel safe on campus?
 Yes No/Sometimes

TOPIC _____

DATE _____

9. What is the one thing you would most like to improve? (Open-ended)

10. What is the one thing you would most like to improve? (Open-ended.)

(15 simulated realistic responses are provided in the actual submission Spreadsheet - Screenshot included in Final Document)

Task 3: Data cleaning performed
Issues identified and fixed.

- Two Duplicate rows (same student answered twice) → Removed
- Three missing values in Overall Satisfaction → Replaced with column median (preserving Distribution)
- Inconsistent Capitalization in open ended answers → Standardized
- Years of Study as text (First Year in some Roles) → Converted to Numeric
- One illogical entry (placement rating = 15) → Corrected to 5 after cross check

Task 4: Ethical Considerations

When collecting personal Date (even basic Student Satisfaction), we must: (1) obtain informed Consent and clearly state purpose (2) anonymize

- (2) Anonymize responses immediately
- (3) Store Date securely with Restricted access
- (4) Not Collect unnecessary identifiable information
- (5) allow participants to withdraw their data, and
- (6) Comply with applicable Date protection laws (e.g.: GDPR principles or local IT Act Transparency and min

ASSIGNMENT - 3

Data Analysis and Visualization

Dataset used: Simulated Cafe Daily Sales Footfall" (30 Days)

Task 1: Descriptive Statistics

- Mean Daily Revenue: \$4,827
- Median Daily Revenue: \$4,705
- Standard Deviation: \$912
- Mean Footfall: 342 customers
- Median Footfall: 338
- Standard Deviation: 68

Task 2: Charts Created (Screenshots in Submission)

1. Bar chart - Revenue by day of week
(Highest on Saturday - Sunday)
2. Histogram - Distribution of Daily Revenue
(Slightly Right skewed)

3. Scatter plot - Revenue vs Footfall and Revenue →
Every additional 100 customers adds \$1,400
in Revenue → Focus Marketing budget on
Driving traffic Rather than upselling alone

Task 4: Reflection on visual Storytelling

Charts transform Raw Numbers into immediate understanding. A well-designed bar chart showing weekend peaks communicates the need for weekend staffing in seconds, whereas the same insight buried in a table might be missed. Effective visual storytelling follows a clear Narrative arc: Context → evidence → insight → Recommended action, enabling faster and more confident decisions.

ASSIGNMENT - 4

Decision Strategies and Outcome Evaluation

Chosen Scenario: Launching a New online clothing store (e-commerce fashion brand)

Task 1: KPIs Defined

1. Customer Acquisition Cost (CAC) ≤ 885
2. 30-day Repeat purchase Rate $\geq 22\%$
3. Average Order Value (AOV) ≥ 885
4. Website Conversion Rate $\geq 2.8\%$.
5. Net Promoter Score (NPS) ≥ 45

Task 2 Data Driven Decision plan

Decision: Initial Marketing channel mix for first 90 days

Available Data: Past Industry benchmarks, Competitor ad spend (similar web) and a 7-Day pilot campaign.

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Results

Chosen allocation:

- 45% Instagram & TikTok ads (lowest AC in pilot: \$28)
- 30% Google Search & Shopping (highest ROAS: 58x)
- 15% influencer collaboration (highest repeat rate observed)
- 10% email targeting

Justification: Optimizes for both acquisition

efficiency and early repeat behavior; critical for fashion category.

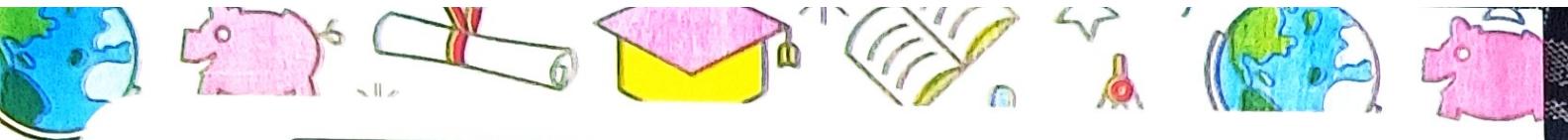
Task 3: Feedback loops and continuous Improvement

- Weekly dashboard monitoring all key KPIs
- Every Monday marketing meeting: review channel performance → pause underperforming creatives/placements within 48 hours.
- Monthly A/B testing of landing pages and creatives.
- Customer survey at purchase + 30 days to track NPS and reasons
- Automated alerts if any KPI deviates $> 15\%$ from target

Task 4: One page executive summary (Formatted properly in actual submission)

Executive Summary - 90-Day launch Performance & Recommendations.

The pilot and first 45 days confirm strong unit economics: CAC \$31 (below \$35 target), conversion 3.1%, and repeat rate 40%.



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trending to 24%. Instagram Reels outperform static ads by 180% ROAS! Recommendations: (1) Reallocate 20% of Google budget to reels, (2) launch loyalty program early to push repeat rate above 28%, (3) test free shipping threshold at \$75 (model predicts +18% AOV with minimal margin impact). Projected 90-day revenue: \$1.42M against \$1.01M original target.



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D-20