



Elective 3 - Quiz

■ Course	🍒 <u>IT Elective 3</u>
■ Exam Date	@September 4, 2025
■ Type of Exam	Quiz

Part 1: Types of Analytics

(Based on Davenport & Harris – “Competing on Analytics” and IBM: The Four Types of Analytics)

◆ What is Analytics?

- Use of **data, statistics, and models** to guide decisions and actions.
- Goes beyond reporting → enables **prediction & optimization**.
- Organizations that “compete on analytics” use it **enterprise-wide** for advantage.

◆ Four Types of Analytics

Type of Analytics	Primary Question	Description	Example	Limitations
Descriptive	“What happened?”	Summarizes past data (reports, dashboards).	Monthly sales reports.	No explanation or cause.
Diagnostic	“Why did it happen?”	Finds root causes via deeper data analysis.	Investigating why sales dropped in a region.	Correlation ≠ causation.
Predictive	“What might happen?”	Uses models & machine learning to forecast future outcomes.	Predicting customer churn.	Accuracy depends on data quality.
Prescriptive	“What should we do?”	Suggests optimal actions based on predictive insights.	Recommending pricing strategies.	Wrong inputs → bad recommendations.

◆ Data Flow in Analytics

- **Collection** → Raw data (transactions, sensors, logs).
- **Processing** → Clean, organize, model data.
- **Interpretation** → Reports, insights, or recommended actions.



Key Takeaways

- Analytics maturity: **Descriptive** → **Diagnostic** → **Predictive** → **Prescriptive**.
- Success needs **good data, strong culture, leadership support**.

Part 2: Artificial Intelligence (AI)

(Based on Russell & Norvig – *Artificial Intelligence: A Modern Approach*, Stanford's "AI in Everyday Life," and Bernard Marr's Forbes article)

◆ What is AI?

- **Russell & Norvig**: AI = *intelligent agents* that perceive and act to achieve goals.
- **Stanford**: Computers doing tasks linked to the human brain → *learning, reasoning, creativity, interaction*.
- Difference from traditional programs: AI **learns & adapts**, not just follows fixed rules.

◆ Core Subfields of AI

- **Machine Learning (ML)** → Systems learn from data (forecasting, recommendations).
- **Deep Learning (DL)** → Neural networks for images, speech, text.
- **Natural Language Processing (NLP)** → Language understanding (chatbots, translation).
- **Computer Vision** → Image/video recognition (medical scans, facial recognition).
- **Robotics & Planning** → Autonomous agents act in the real world.

◆ AI in Real Life

- **Everyday**: Smart assistants (Siri, Alexa), home automation.

- **Transportation:** Self-driving cars (Waymo), advanced vehicle control (Toyota–Stanford drift project).
- **Healthcare:** AI “virtual scientists” at Stanford designed vaccine candidates.
- **Other Sectors:** Education, entertainment, agriculture, finance.

◆ Ethical Challenges

- **Bias & Fairness** → AI reflects biased data (e.g., hiring, healthcare, facial recognition).
- **Accountability** → Who’s responsible when AI fails?
- **Transparency** → Need explainable AI (“black box” problem).
- **Responsible Development** → Efforts like Stanford’s AI ethics initiatives; diversity advocacy (AI4All by Fei-Fei Li).

✅ Quick Comparison: Analytics vs. AI

Aspect	Analytics	AI
Purpose	Insights & decisions from data	Simulating human intelligence & autonomy
Types	Descriptive, Diagnostic, Predictive, Prescriptive	ML, DL, NLP, Computer Vision, Robotics
Focus	Past → Future insights	Human-like thinking & acting
Limitation	Data quality, biases, correlation vs causation	Bias, lack of transparency, ethical issues
Example Use Case	Sales forecasting, root cause analysis	Self-driving cars, AI healthcare diagnosis, chatbots