**AI Quiz Creation & Grading AI Agent**

**End-to-End Prompting Examples**

**System Conceptualization**

**AI Agent Role:** Quiz Creation & Grading Processor (QCG-AI)

**Purpose:** An intelligent agent that can generate quizzes from study material and grade student answers automatically with detailed feedback, partial credit, and explanation of key reasoning.

**Processing Pipeline:**

* **Input Reception →** Receive study material or student answer
* **Data Understanding →** Parse text, identify key concepts
* **Quiz/Answer Analysis →** Generate quiz questions or evaluate student answer
* **Reasoning →** Detect ambiguities, calculate partial credit
* **Explainability →** Highlight key phrases contributing to score
* **Output Generation →** Produce graded answer or quiz in structured format

**PROMPT 1: Zero-Shot Example**

**User Input:**

You are QCG-AI, an expert AI Quiz Creation & Grading agent.

Your task is to process a student answer X and generate a structured evaluation Y.

**INPUT (X):**

Question: Explain the difference between supervised and unsupervised learning.

Student Answer: Supervised learning has labels. Unsupervised learning finds hidden patterns in unlabeled data.

**TASK:**

Analyze this answer and provide:

* Grade (0–10)
* Partial Credit Explanation (if applicable)
* Feedback Summary (clarity, completeness, correctness)
* Explain key phrases influencing grading.

**AI Agent Output (Y):**

Grade: 9.5 / 10

Partial Credit Explanation: 0.5 points deducted for missing illustrative examples.

**Feedback Summary:**

The student demonstrates a clear understanding of supervised and unsupervised learning.

The distinction is accurate and mostly complete.

Adding an example for each would improve clarity.

Explainability (Key Phrases and Influence Scores):

- "Supervised learning has labels" (0.95) – core definition of supervised learning

- "Unsupervised learning finds hidden patterns" (0.92) – core definition of unsupervised learning

- "unlabeled data" (0.88) – key supporting detail

These influence scores (0–1) highlight which phrases contributed most to the AI grading decision.

**Notes:**

* Single-pass evaluation (no prior examples).
* **Demonstrates end-to-end AI reasoning and feedback generation**

**PROMPT 2: Few-Shot Example**

**User Input:**

You are QCG-AI, an expert AI Quiz Creation & Grading agent.

Your task is to evaluate student answers using prior examples to ensure consistent grading.

I will provide several example (X, Y) pairs, followed by a new student answer to evaluate.

**EXAMPLE 1**

**INPUT (X₁):**

**Question: What is overfitting in machine learning?**

**Student Answer: When a model memorizes the training data and performs poorly on new data.**

**OUTPUT (Y₁):**

Grade: 10/10

Feedback: Accurate and concise.

Partial Credit: N/A

Key Phrases: "memorizes the training data" (0.34), "performs poorly on new data" (0.32)

**EXAMPLE 2**

**INPUT (X₂):**

Question: Define feature scaling.

Student Answer: Adjusting features to have similar ranges to improve model convergence.

**OUTPUT (Y₂):**

Grade: 9/10

Feedback: Good explanation; could mention normalization/standardization techniques.

Partial Credit: 1 point deducted for missing minor detail.

Key Phrases: "similar ranges" (0.31), "model convergence" (0.28)

**EXAMPLE 3**

**INPUT (X₃):**

Question: What is cross-validation?

Student Answer: A method for testing model performance using multiple train-test splits.

**OUTPUT (Y₃):**

Grade: 9.5/10

Feedback: Strong answer; minor detail missing on K-fold validation.

Partial Credit: 0.5 points deducted

Key Phrases: "multiple train-test splits" (0.36), "testing model performance" (0.29)

**NEW INPUT (X\_new):**

Question: Explain supervised learning.

Student Answer: It uses labeled data to train models to predict outcomes on new data.

**TASK**

Following the pattern in the examples, perform complete end-to-end evaluation and generate output Y\_new including:

* Grade
* Partial Credit (if applicable)
* Feedback Summary
* Key phrases with influence scores

**AI Agent Output (Y\_new):**

Grade: 9.5 / 10

Partial Credit Explanation: 0.5 points deducted for missing illustrative example.

**Feedback Summary:**

Clear and correct explanation of supervised learning.

Including an example would improve clarity.

Explainability (Key Phrases and Influence Scores):

- "labeled data" (0.35) – identifies core aspect of supervised learning

- "train models" (0.32) – captures action performed

- "predict outcomes on new data" (0.28) – clarifies model purpose

These influence scores (0–1) highlight which phrases contributed most to grading.