Skill and Module Structuring Based on SFIA

1. SFIA-based skill framework
   SFIA skills are organized into five focus tags:
   - DATA: Data science, data engineering, analytics, and AI
   - DEVO: DevOps
   - SOFT: Software engineering
   - CYBR: Information and cyber security
   - CLOUD: Cloud computing within a digital transformation context

   Each SFIA skill is defined by levels 2 to 7 → learners are expected to advance incrementally within these skills.

2. Module
   Each module is defined by:
   - A unique ID
   - A module name
   - Related tag(s)
   - An intended SFIA level

   Modules are not assumed to teach only a single skill, but may cover multiple skills at different levels of depth.

3. Module - SFIA mapping
   Each module is mapped to relevant SFIA skills. For each module - SFIA pair, two levels are specified:
   - Required level
   - Achieved level

4. Skill progression assumption
   - SFIA levels are advanced incrementally
   - Learners typically enter a module at the same level or one level below the module's intended level
   - Advancement to a higher level requires evidence of learning (can be evaluated through assessments/mastery level)

5. Module entry and exit conditions
   Each module is associated with:
   - Entry condition (skill level expected before starting a module)
   - Exit condition (potential update to learner skill level after completion)

6. Module equivalency and alternative learning paths

Module framework allows for the possibility that multiple modules may support similar skill progression because some skill connected to several different tags. This enables alternative paths that the learners can choose to the same skill development goals, but *which one does the learner want to focus more on?*

Mastery Threshold

1. Mastery definition and representation
   Mastery is represented 0-1 for each SFIA skill and level → reflects the learner's confidence in understanding (thresholds are used only when decisions are needed, for example: unlocking next module)

2. Assessment evidence requirement
   Mastery decisions should't be based on a single assessment attempt, a learner must demonstrate one of:
   - Consistent performance across multiple attempt
   - A clear improvement trend between attempts

   These histories are going to support learning cuve analysis and trend detection. We can make the later performance is, the more heavily weighted those attempts → find improvement signals.
   Additionally:
   - Level 2 - 4 → quiz + exercises are enough
   - Level 5 - 7 → require applied evidence (portfolio of study case assessment or project)

3. Failure interpretation
   Failure shouldn't be treated uniformly. Assessment outcomes are interpreted using multiple factors (time spent, error patterns, and attempt consistency). These failures can be categorized into:
   - Conceptual
   - Careless
   - Difficulty

4. Progression and learning continuity
   Each learner has a different learning speed, and we should allow for minor gaps exist → boost learner confidence. On top of that, we need to track unresolved gaps and future recommendations rather than blocking progression.
   - Long inactivity → might reduce confidence → trigger review recommendations (not rollback)

- Flag it (in a good way) if the system detects great improvement → allow the learner to proceed to the next step (or more) if they want → give motivation to the learn deeper into higher level

Rule Priority

1. Prerequisite and safety
   Make sure the learner is not directly entering the deep material without the fundamental one.
   Behaviour:
   - Progression is blocked
   - Exploration is restricted
   - Only remediation or prerequisite content is allowed

2. Failure recovery
   We should handle this when the learner is constantly failing without giving significant improvement in the specific topic
   Behaviour:
   - Override normal progression
   - Giving remediation, alternative explanations, or easier paths
   - Temporarily slow down the learning pace

3. Progression
   Track the forward movement
   Behaviour:
   - Unlock the available next modules
   - Recommend a learning path
   - Maintain the topic's continuity

4. Exploration
   Allow freedom and curiosity
   Behaviour:
   - Offer side paths
   - Suggest related skills
   - Increase recommendation diversity