

Data Dictionary

USERS

Description: Central identity record for all authentication and roles.

Column	Type	Constraints	Description
id	int	PK	Surrogate primary key
name	varchar	NOT NULL	Full display name
email	varchar	UNIQUE, NOT NULL	Login email; unique identifier
password_hash	varchar	NOT NULL	Hashed password
role	varchar	NOT NULL	User role (student/instructor/admin)
created_at	timestamp	Default now()	Account creation time
updated_at	timestamp	—	Last profile update

Notes: Enforce unique email. Consider soft-delete (e.g., deleted_at).

INSTRUCTORS

Description: Instructor profile (1:1 with USERS where role = instructor).

Column	Type	Constraints	Description
id	int	PK	Surrogate key
user_id	int	FK → users.id, UNIQUE, NOT NULL	Links to users record
instructor_code	varchar	UNIQUE	Human/legacy instructor code
bio	text	—	Instructor biography
created_at	timestamp	Default now()	Profile creation time

Note: user_id must be unique to enforce 1:1.

STUDENTS

Description: Student profile (1:1 with USERS where role = student).

Column	Type	Constraints	Description
id	int	PK	Surrogate key
user_id	int	FK → users.id, UNIQUE, NOT NULL	Links to users record
student_number	varchar	UNIQUE, NOT NULL	Institutional student ID
created_at	timestamp	Default now()	Profile creation time

Notes: student_number used for external academic systems.

ADMINS

Description: Admin profile (1:1 with USERS where role = admin).

Column	Type	Constraints	Description
id	int	PK	Surrogate key
user_id	int	FK → users.id, UNIQUE, NOT NULL	Links to users record

Column	Type	Constraints	Description
created_at	timestamp	Default now()	Profile creation time

NOTIFICATIONS

Description: In-app or system notifications tied to a user.

Column	Type	Constraints	Description
id	int	PK	Notification ID
user_id	int	FK → users.id, NOT NULL	Notification recipient
message	text	NOT NULL	Notification body
type	varchar	—	Notification category
is_read	boolean	Default false	Read/unread flag
created_at	timestamp	Default now()	Creation time
read_at	timestamp	—	Time read

Notes: Index user_id for fast lookup.

COURSES

Description: Courses owned by an instructor.

Column	Type	Constraints	Description
id	int	PK	Course ID
instructor_id	int	FK → instructors.id, NOT NULL	Course owner
code	varchar	UNIQUE, NOT NULL	Human-readable course code
title	varchar	NOT NULL	Course title
description	text	—	Long description
status	varchar	—	Course lifecycle state
created_at	timestamp	Default now()	Creation time
updated_at	timestamp	—	Last update time

ENROLLMENTS

Description: Student ↔ Course many-to-many relationship.

Column	Type	Constraints	Description
student_id	int	FK → students.id, NOT NULL	Student
course_id	int	FK → courses.id, NOT NULL	Course
enrolled_at	timestamp	Default now()	Enrollment time
dropped_at	timestamp	—	Drop time
status	varchar	—	Enrollment status

Primary Key: (student_id, course_id)

ASSIGNMENTS

Description: Assignment tasks within a course.

Column	Type	Constraints	Description
id	int	PK	Assignment ID
course_id	int	FK → courses.id, NOT NULL	Owning course
title	varchar	NOT NULL	Assignment title
description	text	—	Full description
release_date	timestamp	—	When available
due_date	timestamp	NOT NULL	Deadline
max_points	int	Default 100	Maximum points
is_published	boolean	Default false	Visibility
allow_late_submissions	boolean	Default false	Late submissions allowed?
created_at	timestamp	Default now()	Creation time
updated_at	timestamp	—	Last update time

TEST_CASES

Description: Autograding test cases per assignment.

Column	Type	Constraints	Description
id	int	PK	Test case ID
assignment_id	int	FK → assignments.id, NOT NULL	Parent assignment
name	varchar	NOT NULL	Test case name
stdin	text	—	Input
expected_out	text	NOT NULL	Expected output
timeout_ms	int	Default 5000	Max allowed runtime
points	int	Default 0	Points awarded
is_visible	boolean	Default true	Visible to student?
sort_order	int	Default 0	Ordering
created_at	timestamp	Default now()	Creation time

SUBMISSIONS

Description: Student submissions for assignments.

Column	Type	Constraints	Description
id	int	PK	Submission ID
assignment_id	int	FK → assignments.id, NOT NULL	Assignment
student_id	int	FK → students.id, NOT NULL	Student
version	int	Default 1	Version number
language	varchar	—	Submission language
status	varchar	—	Submission status
score	decimal	Default 0	Final score
is_late	boolean	Default false	Late flag
created_at	timestamp	Default now()	Timestamp

RESULTS

Description: Execution results of a submission against individual test cases.

Column	Type	Constraints	Description
id	int	PK	Result ID
submission_id	int	FK → submissions.id, NOT NULL	Submission
test_case_id	int	FK → test_cases.id, NOT NULL	Test case
passed	boolean	NOT NULL	Test passed?
stdout	text	—	Program output
stderr	text	—	Error output
runtime_ms	int	—	Execution time
memory_kb	int	—	Memory used
exit_code	int	—	Process exit code
created_at	timestamp	Default now()	Creation time

HINTS

Description: AI-generated hints for a submission.

Column	Type	Constraints	Description
id	int	PK	Hint ID
submission_id	int	FK → submissions.id, NOT NULL	Submission
model_used	varchar	—	Model name
confidence	decimal	0.0–1.0	Model confidence score
hint_text	text	NOT NULL	Hint text
is_helpful	boolean	—	Student feedback
created_at	timestamp	Default now()	Creation time

EMBEDDINGS

Description: Vector embedding reference (1:1 with submission).

Column	Type	Constraints	Description
id	int	PK	Embedding ID
submission_id	int	FK → submissions.id, UNIQUE, NOT NULL	Submission
vector_ref	text	NOT NULL	Pointer to vector storage
model_version	varchar	—	Embedding model version
created_at	timestamp	Default now()	Timestamp

SIMILARITY_FLAGS

Description: Plagiarism/similarity detection results for a submission.

Column	Type	Constraints	Description
id	int	PK	Flag ID
submission_id	int	FK → submissions.id, UNIQUE, NOT NULL	Submission
similarity_score	decimal	0.0–1.0, NOT NULL	Highest similarity score
highlighted_spans	jsonb/text	—	Matched span data
is_reviewed	boolean	Default false	Human-reviewed?
reviewed_by	int	FK → users.id	Reviewer ID

Column	Type	Constraints	Description
review_notes	text	—	Notes
reviewed_at	timestamp	—	Review time
created_at	timestamp	Default now()	Creation time

SIMILARITY_COMPARISONS

Description: Records which other submissions were compared during similarity check.

Column	Type	Constraints	Description
similarity_id	int	FK → similarity_flags.id, NOT NULL	parent similarity flag
compared_submission_id	int	FK → submissions.id, NOT NULL	Compared submission
match_score	decimal	0.0–1.0, NOT NULL	Pairwise score
highlighted_spans	jsonb/text	—	Match details

Primary Key: (similarity_id, compared_submission_id)

PEER_REVIEWS

Description: Peer review records for a submission.

Column	Type	Constraints	Description
id	int	PK	Peer review ID
submission_id	int	FK → submissions.id, NOT NULL	Submission reviewed
reviewer_student_id	int	FK → students.id, NOT NULL	Reviewer student
rubric_scores	jsonb	NOT NULL	Structured rubric
comments	text	—	Reviewer comments
is_submitted	boolean	Default false	Submission status
submitted_at	timestamp	—	Final submission time
created_at	timestamp	Default now()	Creation time

FILES

Description: Files attached to submissions or uploaded by users.

Column	Type	Constraints	Description
id	int	PK	File ID
submission_id	int	FK → submissions.id	