

Phase III – Logical Model Design

Project Title: Daily Habit and Goal Alarm System

1. Entities and Attributes

This phase presents a fully normalized **Logical Data Model** designed to support all core functionalities identified in Phases I and II. The model defines entities, their relationships, constraints, and normalization principles.

1.1. User

Attribute	Type	Description
user_id	INT (PK)	Unique ID for each user
username	VARCHAR(50)	User's login name
email	VARCHAR(100)	User's email (must be unique)
password	VARCHAR(100)	User's password (encrypted)
created_at	DATE	Account creation date

1.2. Habit

Attribute	Type	Description
habit_id	INT (PK)	Unique ID for each habit
user_id	INT (FK)	Linked to User(user_id)
title	VARCHAR(100)	Name of the habit
description	TEXT	Habit details
frequency	VARCHAR(20)	Daily, weekly, etc.
start_date	DATE	When habit begins
status	VARCHAR(20)	Active, paused, completed

1.3. Goal

Attribute	Type	Description
goal_id	INT (PK)	Unique ID for each goal
user_id	INT (FK)	Linked to User(user_id)
title	VARCHAR(100)	Goal name
description	TEXT	Goal description
target_date	DATE	Deadline for goal
status	VARCHAR(20)	In-progress, achieved, failed

1.4. Alarm

Attribute	Type	Description
alarm_id	INT (PK)	Unique alarm ID
habit_id	INT (FK)	Linked to Habit(habit_id)
alarm_time	TIME	Time to notify user
recurrence	VARCHAR(20)	Recurring schedule (e.g., MWF)
is_active	BOOLEAN	Alarm status

1.5. Habit_Log

Attribute	Type	Description
log_id	INT (PK)	Unique ID for log entry
habit_id	INT (FK)	Linked to Habit(habit_id)
log_date	DATE	Date of tracking
status	VARCHAR(20)	Completed, missed, skipped
note	TEXT	Optional user notes

1.6. Goal_Status

Attribute	Type	Description
status_id	INT (PK)	Unique progress log ID
goal_id	INT (FK)	Linked to Goal(goal_id)
update_date	DATE	Date of update
progress_note	TEXT	Description of current progress
completion_percentage	NUMBER(5,2)	e.g., 85.50% complete

2. Relationships

Relationship	Type
One User can have many Habits	1:N
One User can have many Goals	1:N
One Habit has one Alarm	1:1
One Habit can have many Habit_Logs	1:N
One Goal can have many Goal_Status entries	1:N

3. Constraints

- PRIMARY KEY and FOREIGN KEY constraints on all relational fields
- NOT NULL on essential attributes (e.g., title, email, log_date)
- UNIQUE constraint on email
- CHECK constraints for:
 - i) status IN ('active', 'paused', 'completed')
 - ii) completion_percentage BETWEEN 0 AND 100
- Use of DEFAULT values where needed (e.g., is_active = TRUE)

4. Normalization

The logical model satisfies the **Third Normal Form (3NF)**:

- All tables are in 1NF: Each field has atomic values.
- 2NF achieved: No partial dependencies (every non-key attribute fully dependent on PK).
- 3NF achieved: No transitive dependencies.

5. ERD Diagram

