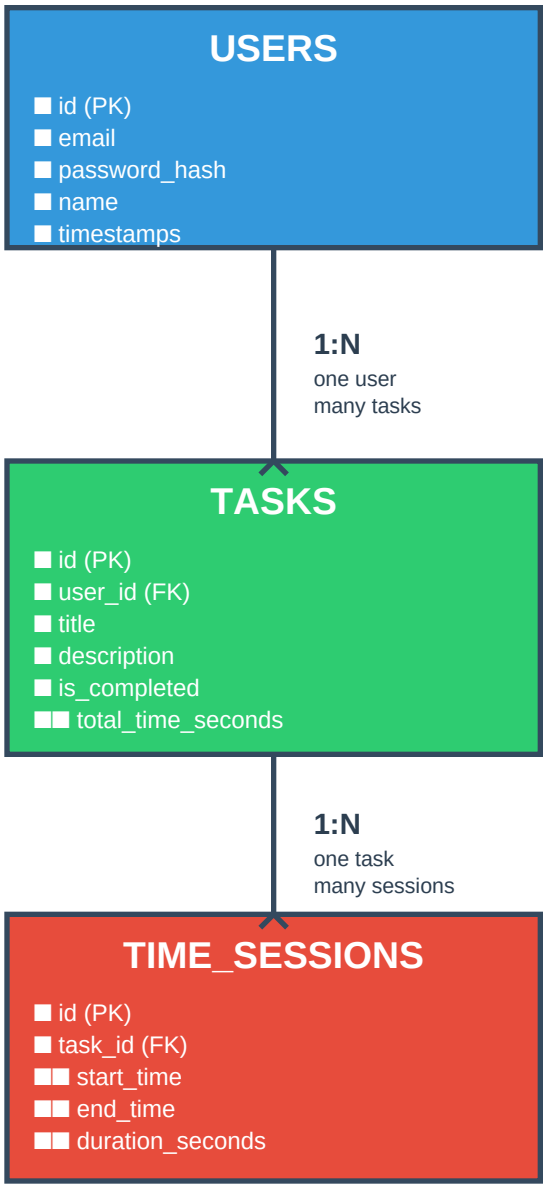
Database Design

ANKA Task & Time Tracker

Entity Relationship Diagram


USERS
id (PK)
email
password_hash
name
timestamps
1:N
one user
many tasks
TASKS
id (PK)
user_id (FK)
title
description
is_completed
total_time_seconds
1:N
one task
many sessions
TIME_SESSIONS
id (PK)
task_id (FK)
start_time
end_time
duration_seconds

Database Tables

1. Users Table

Column	Type	Constraints	Description
id	SERIAL	PRIMARY KEY	Unique identifier
email	VARCHAR(255)	UNIQUE, NOT NULL	User email (login)
password_hash	VARCHAR(255)	NOT NULL	Hashed password
name	VARCHAR(100)	NOT NULL	User display name
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP	DEFAULT NOW()	Last update timestamp

2. Tasks Table

Column	Type	Constraints	Description
id	SERIAL	PRIMARY KEY	Unique identifier
user_id	INTEGER	FK → users.id	Owner of the task
title	VARCHAR(255)	NOT NULL	Task title
description	TEXT	NULLABLE	Task description (optional)
is_completed	BOOLEAN	DEFAULT FALSE	Completion status
total_time_seconds	INTEGER	DEFAULT 0	Total time tracked
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP	DEFAULT NOW()	Last update timestamp

3. Time Sessions Table

Column	Type	Constraints	Description
id	SERIAL	PRIMARY KEY	Unique identifier
task_id	INTEGER	FK → tasks.id	Associated task
start_time	TIMESTAMP	NOT NULL	Timer start time
end_time	TIMESTAMP	NULLABLE	Timer end (NULL if active)
duration_seconds	INTEGER	NULLABLE	Session duration
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

Table Relationships

1. Users → Tasks (One-to-Many)

Relationship Type	One-to-Many (1:N)
Description	One user can have many tasks
Foreign Key	tasks.user_id → users.id
Delete Behavior	CASCADE (delete user → delete all their tasks)
Business Rule	Each task belongs to exactly one user

2. Tasks → Time Sessions (One-to-Many)

Relationship Type	One-to-Many (1:N)
Description	One task can have many time tracking sessions
Foreign Key	time_sessions.task_id → tasks.id
Delete Behavior	CASCADE (delete task → delete all its sessions)
Business Rule	Each session belongs to exactly one task

Key Points

• **Referential Integrity:** Foreign keys ensure data consistency
• **Cascade Delete:** Prevents orphaned records when parent is deleted
• **Data Isolation:** Each user only sees their own tasks and sessions
• **Scalability:** Indexes on foreign keys ensure fast query performance