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# 🧠 Code & Content

### 📄 README.md

# 🏃 Smart Marathon Coach API  
  
This is a Flask-based API for syncing Strava activity data, enriching runs, and generating training insights. This repo is part of a multi-phase project — currently in \*\*Milestone 1: Setup & Plumbing\*\*.  
  
---  
  
## 🚀 Getting Started  
  
### 1. Clone the repo  
  
```bash  
git clone https://github.com/your-username/railway-pg-test.git  
cd railway-pg-test  
  
  
### 2. Set up your virtual environment  
  
```bash  
python -m venv venv  
venv\Scripts\activate # On Windows  
# or  
source venv/bin/activate # On Mac/Linux  
```  
  
### 3. Install dependencies  
  
```bash  
pip install -r requirements.txt  
```  
  
---  
  
## 🛠️ Environment Configuration  
  
Copy the example `.env` file and fill in your secrets:  
  
```bash  
cp .env.example .env  
```  
  
Or manually create `.env` with values like:  
  
```env  
DATABASE\_URL=postgresql://smartcoach:devpass@postgres:5432/smartcoach  
  
# NOTE: For local dev without Docker, change "postgres" → "localhost"  
# DATABASE\_URL=postgresql://smartcoach:devpass@localhost:5432/smartcoach  
  
STRAVA\_CLIENT\_ID=your\_client\_id  
STRAVA\_CLIENT\_SECRET=your\_client\_secret  
REDIRECT\_URI=http://127.0.0.1:5000/oauth/callback  
ADMIN\_USER=admin  
ADMIN\_PASS=secret  
SECRET\_KEY=supersecretkey  
CRON\_SECRET\_KEY=your\_cron\_key  
INTERNAL\_API\_KEY=your\_internal\_key  
  
```  
  
---  
  
## 💻 Running Locally  
  
```bash  
python run.py  
```  
  
Then open [http://127.0.0.1:5000/ping](http://127.0.0.1:5000/ping)   
You should see: `pong`  
  
---  
  
## 🧪 Endpoints (Milestone 1)  
  
| Route | Description |  
|-----------------|----------------------------------|  
| `/ping` | Health check |  
| `/init-db` | Creates DB tables |  
| `/auth/login` | Basic credential-based login |  
| `/auth/logout` | Clear session |  
| `/enrich/status`| Returns enrichment status (stub) |  
  
> More functionality is coming in Milestone 2  
  
---  
  
## 🧬 GitHub Actions  
  
We’ve added a skeleton workflow in `.github/workflows/cron-sync.yml` that:  
  
- Runs every 6 hours  
- Supports manual trigger  
- Runs placeholder logic (future expansion)  
  
---  
  
## 🧩 Project Structure  
  
```bash  
railway-pg-test/  
├── src/  
│ ├── app.py → Flask app entrypoint  
│ ├── routes/ → Route blueprints  
│ ├── services/ → Business logic  
│ ├── db/ → Database models + sessions  
│ └── utils/ → Utility functions  
├── schema.sql → Creates core DB tables  
├── run.py → Runs the app  
├── requirements.txt  
└── .env → Environment variables  
  
```  
  
---  
  
## 📦 Requirements  
  
- Python 3.11+  
- SQLite or Postgres  
- A Strava API App (https://www.strava.com/settings/api)

### 📄 alembic\env.py

import sys  
import os  
  
import src.db.models.athletes  
  
  
# --- Add project root to sys.path ---  
project\_root = os.path.dirname(os.path.dirname(os.path.abspath(\_\_file\_\_)))  
sys.path.insert(0, project\_root)  
  
# --- Add 'src' folder to sys.path so Alembic can find env\_loader ---  
sys.path.insert(0, os.path.join(project\_root, "src"))  
  
# --- Now safe to import env\_loader ---  
import configuration.env\_loader as env\_loader # <-- This will correctly apply DATABASE\_URL patches  
  
from logging.config import fileConfig  
from sqlalchemy import engine\_from\_config, pool  
from alembic import context  
  
# DATABASE\_URL after env\_loader patched it  
DATABASE\_URL = os.getenv("DATABASE\_URL")  
  
print(f"DEBUG: Using DATABASE\_URL = {DATABASE\_URL}")  
  
if not DATABASE\_URL:  
 raise RuntimeError("DATABASE\_URL environment variable is not set. Alembic cannot continue.")  
  
# Import SQLAlchemy Base AFTER sys.path is fully patched  
from src.db.db\_session import Base  
  
# ✅ Import all models so that Alembic can detect them  
import src.db.models.activities  
import src.db.models.tokens  
import src.db.models.splits  
import src.db.models.athletes # <--- add this linea  
  
# Alembic Config object  
config = context.config  
  
# Configure logging  
if config.config\_file\_name is not None:  
 fileConfig(config.config\_file\_name)  
  
# Set target metadata for autogenerate  
target\_metadata = Base.metadata  
  
# Inject DATABASE\_URL dynamically for Alembic migrations  
config.set\_main\_option("sqlalchemy.url", DATABASE\_URL)  
  
  
def run\_migrations\_offline():  
 """Run migrations in 'offline' mode (no DB connection)."""  
 url = config.get\_main\_option("sqlalchemy.url")  
 context.configure(  
 url=url,  
 target\_metadata=target\_metadata,  
 literal\_binds=True,  
 compare\_type=True,  
 )  
  
 with context.begin\_transaction():  
 context.run\_migrations()  
  
  
def run\_migrations\_online():  
 """Run migrations in 'online' mode (DB connection active)."""  
 connectable = engine\_from\_config(  
 config.get\_section(config.config\_ini\_section),  
 prefix="sqlalchemy.",  
 poolclass=pool.NullPool,  
 )  
  
 with connectable.connect() as connection:  
 context.configure(  
 connection=connection,  
 target\_metadata=target\_metadata,  
 compare\_type=True,  
 )  
  
 with context.begin\_transaction():  
 context.run\_migrations()  
  
  
if context.is\_offline\_mode():  
 run\_migrations\_offline()  
else:  
 run\_migrations\_online()

### 📄 alembic\versions\74a21806400c\_initial\_migration\_with\_athletes.py

"""initial migration with athletes  
  
Revision ID: 74a21806400c  
Revises:   
Create Date: 2025-06-14 12:14:53.762025  
"""  
from typing import Sequence, Union  
  
from alembic import op  
import sqlalchemy as sa  
  
# revision identifiers, used by Alembic.  
revision: str = '74a21806400c'  
down\_revision: Union[str, None] = None  
branch\_labels: Union[str, Sequence[str], None] = None  
depends\_on: Union[str, Sequence[str], None] = None  
  
  
def upgrade() -> None:  
 """Upgrade schema."""  
 op.create\_table('activities',  
 sa.Column('activity\_id', sa.BigInteger(), nullable=False),  
 sa.Column('athlete\_id', sa.BigInteger(), nullable=False),  
 sa.Column('name', sa.String(), nullable=True),  
 sa.Column('type', sa.String(), nullable=True),  
 sa.Column('start\_date', sa.DateTime(), nullable=True),  
 sa.Column('distance', sa.Float(), nullable=True),  
 sa.Column('elapsed\_time', sa.Integer(), nullable=True),  
 sa.Column('moving\_time', sa.Integer(), nullable=True),  
 sa.Column('total\_elevation\_gain', sa.Float(), nullable=True),  
 sa.Column('external\_id', sa.String(), nullable=True),  
 sa.Column('timezone', sa.String(), nullable=True),  
 sa.Column('average\_speed', sa.Float(), nullable=True),  
 sa.Column('max\_speed', sa.Float(), nullable=True),  
 sa.Column('suffer\_score', sa.Float(), nullable=True),  
 sa.Column('average\_heartrate', sa.Float(), nullable=True),  
 sa.Column('max\_heartrate', sa.Float(), nullable=True),  
 sa.Column('calories', sa.Float(), nullable=True),  
 sa.Column('conv\_distance', sa.Float(), nullable=True),  
 sa.Column('conv\_elevation\_feet', sa.Float(), nullable=True),  
 sa.Column('conv\_avg\_speed', sa.Float(), nullable=True),  
 sa.Column('conv\_max\_speed', sa.Float(), nullable=True),  
 sa.Column('conv\_moving\_time', sa.String(), nullable=True),  
 sa.Column('conv\_elapsed\_time', sa.String(), nullable=True),  
 sa.Column('hr\_zone\_1', sa.Float(), nullable=True),  
 sa.PrimaryKeyConstraint('activity\_id')  
 )  
 op.create\_index(op.f('ix\_activities\_activity\_id'), 'activities', ['activity\_id'], unique=False)  
 op.create\_index(op.f('ix\_activities\_athlete\_id'), 'activities', ['athlete\_id'], unique=False)  
  
 op.create\_table('athletes',  
 sa.Column('id', sa.Integer(), nullable=False),  
 sa.Column('strava\_athlete\_id', sa.BigInteger(), nullable=False),  
 sa.Column('name', sa.String(), nullable=True),  
 sa.Column('email', sa.String(), nullable=True),  
 sa.Column('created\_at', sa.DateTime(), server\_default=sa.text('now()'), nullable=True),  
 sa.PrimaryKeyConstraint('id'),  
 sa.UniqueConstraint('strava\_athlete\_id')  
 )  
  
 op.create\_table('splits',  
 sa.Column('id', sa.Integer(), nullable=False),  
 sa.Column('activity\_id', sa.BigInteger(), nullable=False),  
 sa.Column('lap\_index', sa.Integer(), nullable=False),  
 sa.Column('distance', sa.Float(), nullable=True),  
 sa.Column('elapsed\_time', sa.Integer(), nullable=True),  
 sa.Column('moving\_time', sa.Integer(), nullable=True),  
 sa.Column('average\_speed', sa.Float(), nullable=True),  
 sa.Column('max\_speed', sa.Float(), nullable=True),  
 sa.Column('start\_index', sa.Integer(), nullable=True),  
 sa.Column('end\_index', sa.Integer(), nullable=True),  
 sa.Column('split', sa.Boolean(), nullable=True),  
 sa.Column('average\_heartrate', sa.Float(), nullable=True),  
 sa.Column('pace\_zone', sa.Integer(), nullable=True),  
 sa.Column('created\_at', sa.TIMESTAMP(), server\_default=sa.text('now()'), nullable=True),  
 sa.Column('conv\_distance', sa.Float(), nullable=True),  
 sa.Column('conv\_avg\_speed', sa.Float(), nullable=True),  
 sa.Column('conv\_moving\_time', sa.String(), nullable=True),  
 sa.Column('conv\_elapsed\_time', sa.String(), nullable=True),  
 sa.ForeignKeyConstraint(['activity\_id'], ['activities.activity\_id'], ondelete='CASCADE'),  
 sa.PrimaryKeyConstraint('id'),  
 sa.UniqueConstraint('activity\_id', 'lap\_index', name='uq\_activity\_lap')  
 )  
  
  
def downgrade() -> None:  
 """Downgrade schema."""  
 op.drop\_table('splits')  
 op.drop\_table('athletes')  
 op.drop\_index(op.f('ix\_activities\_athlete\_id'), table\_name='activities')  
 op.drop\_index(op.f('ix\_activities\_activity\_id'), table\_name='activities')  
 op.drop\_table('activities')

### 📄 alembic\versions\c0882d180ef9\_add\_hr\_zone\_2\_to\_5\_to\_activities.py

"""add hr\_zone\_2\_to\_5 to activities  
  
Revision ID: c0882d180ef9  
Revises: 74a21806400c  
Create Date: 2025-06-14 12:40:49.255960  
  
"""  
from typing import Sequence, Union  
  
from alembic import op  
import sqlalchemy as sa  
  
  
# revision identifiers, used by Alembic.  
revision: str = 'c0882d180ef9'  
down\_revision: Union[str, None] = '74a21806400c'  
branch\_labels: Union[str, Sequence[str], None] = None  
depends\_on: Union[str, Sequence[str], None] = None  
  
  
def upgrade() -> None:  
 """Upgrade schema."""  
 # ### commands auto generated by Alembic - please adjust! ###  
 op.add\_column('activities', sa.Column('hr\_zone\_2', sa.Float(), nullable=True))  
 op.add\_column('activities', sa.Column('hr\_zone\_3', sa.Float(), nullable=True))  
 op.add\_column('activities', sa.Column('hr\_zone\_4', sa.Float(), nullable=True))  
 op.add\_column('activities', sa.Column('hr\_zone\_5', sa.Float(), nullable=True))  
 # ### end Alembic commands ###  
  
  
def downgrade() -> None:  
 """Downgrade schema."""  
 # ### commands auto generated by Alembic - please adjust! ###  
 op.drop\_column('activities', 'hr\_zone\_5')  
 op.drop\_column('activities', 'hr\_zone\_4')  
 op.drop\_column('activities', 'hr\_zone\_3')  
 op.drop\_column('activities', 'hr\_zone\_2')  
 # ### end Alembic commands ###

### 📄 configuration\env\_loader.py

import os  
from dotenv import load\_dotenv  
  
# Load .env variables automatically  
load\_dotenv()  
  
is\_local = os.environ.get("IS\_LOCAL", "false").lower() == "true"  
in\_docker = os.path.exists('/.dockerenv') or os.environ.get("IN\_DOCKER", "false").lower() == "true"  
  
# Step 1 — Force DATABASE\_URL if not set  
env\_db\_url = os.environ.get("DATABASE\_URL")  
  
if not env\_db\_url:  
 if in\_docker:  
 env\_db\_url = "postgresql+psycopg2://smartcoach:devpass@postgres:5432/smartcoach"  
 else:  
 env\_db\_url = "postgresql+psycopg2://smartcoach:devpass@localhost:15432/smartcoach"  
  
 os.environ["DATABASE\_URL"] = env\_db\_url  
 print(f"🔧 DATABASE\_URL defaulted: {env\_db\_url}")  
  
# Step 2 — Normalize psycopg2  
patched\_db\_url = os.environ["DATABASE\_URL"]  
if patched\_db\_url.startswith("postgresql+psycopg2://"):  
 patched\_db\_url = patched\_db\_url.replace("postgresql+psycopg2://", "postgresql://")  
 os.environ["DATABASE\_URL"] = patched\_db\_url  
 print(f"🔧 DATABASE\_URL normalized for psycopg2: {patched\_db\_url}")  
  
# Final confirmation  
print(f"🔍 Final DATABASE\_URL: {os.environ['DATABASE\_URL']}")

### 📄 run.py

# run.py  
  
import os  
import sys  
from pathlib import Path  
from dotenv import load\_dotenv  
  
print("📦 Starting run.py...", flush=True)  
  
# 🔐 Load .env explicitly (important in Docker or if run manually)  
load\_dotenv()  
  
# Ensure the project root is on PYTHONPATH  
sys.path.insert(0, str(Path(\_\_file\_\_).resolve().parent))  
  
  
# Auto-rewrite DATABASE\_URL for local if necessary  
env\_db\_url = os.environ.get("DATABASE\_URL")  
is\_local = os.environ.get("IS\_LOCAL", "false").lower() == "true"  
  
if is\_local and env\_db\_url and 'postgres@postgres:' in env\_db\_url:  
 patched\_db\_url = env\_db\_url.replace('postgres@postgres:', 'postgres@localhost:')  
 os.environ['DATABASE\_URL'] = patched\_db\_url  
 print(f"🔧 DATABASE\_URL rewritten for local: {patched\_db\_url}", flush=True)  
else:  
 print(f"✅ DATABASE\_URL used as-is: {env\_db\_url}", flush=True)  
  
# Attempt to create the app and log failure explicitly  
try:  
 from src.app import create\_app  
 app = create\_app() # 🔑 Gunicorn will reference this: "run:app"  
 print("✅ App created via create\_app()", flush=True)  
except Exception as e:  
 print("🔥 App creation failed:", e, flush=True)  
 import traceback  
 traceback.print\_exc()  
 raise # Re-raise so Railway crash logs capture the stack  
  
# CLI mode: run init-db early and exit  
if len(sys.argv) > 1 and sys.argv[1] == "init-db":  
 from src.db.init\_db import init\_db  
 print("🔧 Running init-db...", flush=True)  
 try:  
 init\_db()  
 print("✅ init-db completed successfully", flush=True)  
 except Exception as e:  
 print("❌ init-db failed:", e, flush=True)  
 import traceback  
 traceback.print\_exc()  
 sys.exit(1)  
 sys.exit(0)  
  
# Check that templates folder is visible to Flask  
template\_dir = Path(\_\_file\_\_).parent / "templates"  
if not template\_dir.exists():  
 print(f"❌ Template folder not found: {template\_dir}")  
else:  
 print(f"📂 Template folder contents: {[f.name for f in template\_dir.glob('\*')]}")  
  
# If run directly, use Flask dev server  
if \_\_name\_\_ == "\_\_main\_\_":  
 port = int(os.environ.get("PORT", 5050))  
  
 # 🔍 Full environment debug  
 env\_db\_url = os.environ.get("DATABASE\_URL")  
 config\_db\_url = app.config.get("DATABASE\_URL") or env\_db\_url  
 print("🔍 ENV DATABASE\_URL =", env\_db\_url, flush=True)  
 print("🔍 CONFIG DATABASE\_URL =", config\_db\_url, flush=True)  
  
 if not config\_db\_url:  
 print("❗ DATABASE\_URL not set — exiting", flush=True)  
 sys.exit(1)  
  
 try:  
 from psycopg2 import connect  
 print(f"🔌 Attempting psycopg2.connect() to: {config\_db\_url}", flush=True)  
 conn = connect(config\_db\_url)  
 with conn.cursor() as cur:  
 cur.execute("SELECT 1;")  
 cur.fetchone()  
 print("✅ DB test query succeeded!", flush=True)  
 except Exception as e:  
 print("⚠️ DB test query failed:", e, flush=True)  
 import traceback  
 traceback.print\_exc()  
  
 print(f"🚀 Starting app locally on 0.0.0.0:{port}", flush=True)  
 app.run(host="0.0.0.0", port=port, debug=True)

### 📄 src\\_\_init\_\_.py

### 📄 src\app.py

import os  
from pathlib import Path  
from flask import Flask  
  
from src.routes.admin\_routes import admin\_bp  
from src.routes.auth\_routes import auth\_bp  
from src.routes.activity\_routes import activity\_bp  
  
  
def create\_app(test\_config=None):  
 print("✅ ENTERED create\_app()", flush=True)  
 print("📁 CWD:", os.getcwd(), flush=True)  
 print("📁 Contents of current working dir:", os.listdir(os.getcwd()), flush=True)  
  
 env\_mode = os.getenv("FLASK\_ENV", "production")  
 is\_local = os.getenv("IS\_LOCAL", "false").lower() == "true"  
 print(f"🌍 FLASK\_ENV={env\_mode} | IS\_LOCAL={is\_local}", flush=True)  
  
 print("🔐 ADMIN\_USER:", os.getenv("ADMIN\_USER"))  
 print("🔐 ADMIN\_PASS:", os.getenv("ADMIN\_PASS"))  
 print("🔐 STRAVA\_CLIENT\_ID:", os.getenv("STRAVA\_CLIENT\_ID"))  
 print("🔐 STRAVA\_CLIENT\_SECRET:", os.getenv("STRAVA\_CLIENT\_SECRET"))  
 print("🔐 REDIRECT\_URI:", os.getenv("REDIRECT\_URI"))  
 print("💾 ENV DATABASE\_URL:", os.getenv("DATABASE\_URL"))  
  
 templates\_path = Path(\_\_file\_\_).resolve().parent.parent / "templates"  
  
 app = Flask(  
 \_\_name\_\_,  
 instance\_relative\_config=False,  
 template\_folder=str(templates\_path)  
 )  
  
 app.config.from\_mapping(  
 SECRET\_KEY=os.environ.get("SECRET\_KEY", "dev"),  
 DATABASE\_URL=os.environ.get("DATABASE\_URL"),  
 CRON\_SECRET\_KEY=os.environ.get("CRON\_SECRET\_KEY"),  
 INTERNAL\_API\_KEY=os.environ.get("INTERNAL\_API\_KEY"),  
 )  
  
 if test\_config:  
 app.config.update(test\_config)  
  
 print("💾 CONFIG DATABASE\_URL:", app.config.get("DATABASE\_URL"))  
  
 # ✅ Register Blueprints  
 app.register\_blueprint(auth\_bp, url\_prefix="/auth")  
 app.register\_blueprint(admin\_bp, url\_prefix="/admin")  
 app.register\_blueprint(activity\_bp, url\_prefix="/sync")  
  
  
 @app.route("/ping")  
 def ping():  
 return "pong", 200  
  
 @app.route("/db-check")  
 def db\_check():  
 try:  
 from psycopg2 import connect  
 db\_url = app.config.get("DATABASE\_URL")  
 print("🧪 /db-check using DB URL:", db\_url, flush=True)  
 conn = connect(db\_url)  
 with conn.cursor() as cur:  
 cur.execute("SELECT 1;")  
 cur.fetchone()  
 return {"status": "ok", "db": True}  
 except Exception as e:  
 import traceback  
 print("🔥 DB-CHECK EXCEPTION:", flush=True)  
 traceback.print\_exc()  
 return {"status": "fail", "error": str(e)}, 500  
  
 @app.route("/startup")  
 def startup():  
 return {  
 "status": "started",  
 "env\_PORT": os.environ.get("PORT"),  
 "env\_DATABASE\_URL": os.environ.get("DATABASE\_URL"),  
 "config\_DATABASE\_URL": app.config.get("DATABASE\_URL"),  
 "cwd": os.getcwd(),  
 "files": [p.name for p in Path(".").iterdir()],  
 }  
  
 print("✅ Registered routes:")  
 for rule in app.url\_map.iter\_rules():  
 print(f" {rule.rule} -> {rule.endpoint}", flush=True)  
  
 return app

### 📄 src\db\\_\_init\_\_.py

### 📄 src\db\dao\activity\_dao.py

from sqlalchemy.dialects.postgresql import insert  
from sqlalchemy.orm import Session  
from src.db.models.activities import Activity  
  
def upsert\_activities(session: Session, athlete\_id: int, activities: list[dict]) -> int:  
 if not activities:  
 return 0  
  
 stmt = insert(Activity).values([{  
 "activity\_id": act["id"],  
 "athlete\_id": athlete\_id,  
 "name": act.get("name"),  
 "type": act.get("type"),  
 "start\_date": act.get("start\_date"),  
 "distance": act.get("distance"),  
 "elapsed\_time": act.get("elapsed\_time"),  
 "moving\_time": act.get("moving\_time"),  
 "total\_elevation\_gain": act.get("total\_elevation\_gain"),  
 "external\_id": act.get("external\_id"),  
 "timezone": act.get("timezone"),  
 "hr\_zone\_1": act.get("hr\_zone\_1"), # ✅ Added enrichment field  
 } for act in activities])  
  
 update\_cols = {  
 "name": stmt.excluded.name,  
 "type": stmt.excluded.type,  
 "start\_date": stmt.excluded.start\_date,  
 "distance": stmt.excluded.distance,  
 "elapsed\_time": stmt.excluded.elapsed\_time,  
 "moving\_time": stmt.excluded.moving\_time,  
 "total\_elevation\_gain": stmt.excluded.total\_elevation\_gain,  
 "external\_id": stmt.excluded.external\_id,  
 "timezone": stmt.excluded.timezone,  
 "hr\_zone\_1": stmt.excluded.hr\_zone\_1, # ✅ Include on update  
 }  
  
 stmt = stmt.on\_conflict\_do\_update(  
 index\_elements=["activity\_id"],  
 set\_=update\_cols  
 )  
  
 result = session.execute(stmt)  
 session.commit()  
 return result.rowcount

### 📄 src\db\dao\athlete\_dao.py

from sqlalchemy.orm import Session  
from src.db.models.athletes import Athlete  
from src.db.db\_session import get\_db\_session  
  
def get\_athlete\_by\_strava\_id(strava\_id: int) -> Athlete | None:  
 with get\_db\_session() as session:  
 return session.query(Athlete).filter\_by(strava\_athlete\_id=strava\_id).first()  
  
def insert\_athlete(strava\_athlete\_id: int, name: str = None, email: str = None) -> int:  
 with get\_db\_session() as session:  
 athlete = Athlete(  
 strava\_athlete\_id=strava\_athlete\_id,  
 name=name,  
 email=email  
 )  
 session.add(athlete)  
 session.commit()  
 session.refresh(athlete)  
 return athlete.id  
  
def get\_athlete\_id\_from\_strava\_id(strava\_id: int) -> int | None:  
 with get\_db\_session() as session:  
 result = session.query(Athlete.id).filter\_by(strava\_athlete\_id=strava\_id).first()  
 return result.id if result else None

### 📄 src\db\dao\split\_dao.py

# src/db/dao/split\_dao.py  
  
from sqlalchemy.dialects.postgresql import insert  
from src.db.models.splits import Split  
  
def upsert\_splits(session, splits: list) -> int:  
 """  
 Upserts splits into the 'splits' table using SQLAlchemy ORM session.  
 Fully safe for PostgreSQL transactions (uses flush/commit correctly).  
 """  
 if not splits:  
 return 0  
  
 stmt = insert(Split).values([{  
 "activity\_id": split["activity\_id"],  
 "lap\_index": split["lap\_index"],  
 "distance": split["distance"],  
 "elapsed\_time": split["elapsed\_time"],  
 "moving\_time": split["moving\_time"],  
 "average\_speed": split["average\_speed"],  
 "max\_speed": split["max\_speed"],  
 "start\_index": split["start\_index"],  
 "end\_index": split["end\_index"],  
 "split": split["split"],  
 "average\_heartrate": split.get("average\_heartrate"),  
 "pace\_zone": split.get("pace\_zone"),  
 "conv\_distance": split.get("conv\_distance"),  
 "conv\_avg\_speed": split.get("conv\_avg\_speed"), # ✅ updated to support string  
 "conv\_moving\_time": split.get("conv\_moving\_time"),  
 "conv\_elapsed\_time": split.get("conv\_elapsed\_time"),  
 } for split in splits])  
  
 update\_cols = {  
 "lap\_index": stmt.excluded.lap\_index,  
 "distance": stmt.excluded.distance,  
 "elapsed\_time": stmt.excluded.elapsed\_time,  
 "moving\_time": stmt.excluded.moving\_time,  
 "average\_speed": stmt.excluded.average\_speed,  
 "max\_speed": stmt.excluded.max\_speed,  
 "start\_index": stmt.excluded.start\_index,  
 "end\_index": stmt.excluded.end\_index,  
 "split": stmt.excluded.split,  
 "average\_heartrate": stmt.excluded.average\_heartrate,  
 "pace\_zone": stmt.excluded.pace\_zone,  
 "conv\_distance": stmt.excluded.conv\_distance,  
 "conv\_avg\_speed": stmt.excluded.conv\_avg\_speed,  
 "conv\_moving\_time": stmt.excluded.conv\_moving\_time,  
 "conv\_elapsed\_time": stmt.excluded.conv\_elapsed\_time,  
 }  
  
 stmt = stmt.on\_conflict\_do\_update(  
 index\_elements=["activity\_id", "lap\_index"],  
 set\_=update\_cols  
 )  
  
 result = session.execute(stmt)  
 session.commit()  
 return result.rowcount

### 📄 src\db\dao\token\_dao.py

# src/db/dao/token\_dao.py  
  
from datetime import datetime  
from sqlalchemy.exc import NoResultFound, IntegrityError  
from flask import current\_app  
import os  
  
from src.db.db\_session import get\_session # ✅ consistent db\_session usage  
from src.db.models.tokens import Token  
from sqlalchemy.dialects.postgresql import insert  
  
def get\_tokens\_sa(session, athlete\_id):  
 """  
 Retrieve access, refresh, and expiration tokens for the given athlete using SQLAlchemy.  
 """  
 try:  
 token = session.query(Token).filter\_by(athlete\_id=athlete\_id).one()  
 return {  
 "access\_token": token.access\_token,  
 "refresh\_token": token.refresh\_token,  
 "expires\_at": token.expires\_at  
 }  
 except NoResultFound:  
 return None  
  
  
  
def insert\_token\_sa(session, athlete\_id, access\_token, refresh\_token, expires\_at):  
 existing = session.query(Token).filter\_by(athlete\_id=athlete\_id).first()  
  
 if existing:  
 existing.access\_token = access\_token  
 existing.refresh\_token = refresh\_token  
 existing.expires\_at = expires\_at  
 else:  
 new\_token = Token(  
 athlete\_id=athlete\_id,  
 access\_token=access\_token,  
 refresh\_token=refresh\_token,  
 expires\_at=expires\_at  
 )  
 session.add(new\_token)  
  
 session.commit()  
  
  
def delete\_tokens\_sa(session, athlete\_id):  
 """  
 Deletes token record for the given athlete ID.  
 """  
 session.query(Token).filter\_by(athlete\_id=athlete\_id).delete()  
 session.commit()

### 📄 src\db\db\_session.py

# src/db/db\_session.py  
  
import os  
from sqlalchemy import create\_engine  
from sqlalchemy.orm import declarative\_base, sessionmaker  
from flask import current\_app, has\_app\_context  
  
# Global declarative base — shared across models  
Base = declarative\_base()  
  
def resolve\_db\_url():  
 """  
 Resolve DATABASE\_URL from Flask config or environment variables.  
 """  
 if has\_app\_context():  
 # Use Flask app config if inside app context  
 return current\_app.config.get("DATABASE\_URL") or os.getenv("DATABASE\_URL")  
 return os.getenv("DATABASE\_URL")  
  
def get\_engine(db\_url=None):  
 """  
 Create a SQLAlchemy engine.  
 Allows optional db\_url override for tests or special cases.  
 """  
 db\_url = db\_url or resolve\_db\_url()  
 if not db\_url:  
 raise RuntimeError("DATABASE\_URL is not set in environment or app config.")  
 return create\_engine(db\_url, echo=False, future=True)  
  
def get\_session(engine=None):  
 """  
 Create a new SQLAlchemy sessionmaker (not a global session).  
 Allows optional engine injection for test harnesses.  
 """  
 engine = engine or get\_engine()  
 SessionLocal = sessionmaker(bind=engine, autoflush=False, autocommit=False, future=True)  
 return SessionLocal()

### 📄 src\db\models\activities.py

from sqlalchemy import Column, BigInteger, Integer, String, Float, DateTime  
from src.db.db\_session import Base  
  
class Activity(Base):  
 \_\_tablename\_\_ = "activities"  
  
 activity\_id = Column(BigInteger, primary\_key=True, index=True)  
 athlete\_id = Column(BigInteger, nullable=False, index=True)  
 name = Column(String)  
 type = Column(String)  
 start\_date = Column(DateTime)  
 distance = Column(Float)  
 elapsed\_time = Column(Integer)  
 moving\_time = Column(Integer)  
 total\_elevation\_gain = Column(Float)  
 external\_id = Column(String)  
 timezone = Column(String)  
  
 average\_speed = Column(Float)  
 max\_speed = Column(Float)  
 suffer\_score = Column(Float)  
 average\_heartrate = Column(Float)  
 max\_heartrate = Column(Float)  
 calories = Column(Float)  
  
 conv\_distance = Column(Float)  
 conv\_elevation\_feet = Column(Float)  
 conv\_avg\_speed = Column(Float)  
 conv\_max\_speed = Column(Float)  
 conv\_moving\_time = Column(String)  
 conv\_elapsed\_time = Column(String)  
  
 # HR Zone enrichment (test field)  
 hr\_zone\_1 = Column(Float, nullable=True)  
 hr\_zone\_2 = Column(Float, nullable=True)  
 hr\_zone\_3 = Column(Float, nullable=True)  
 hr\_zone\_4 = Column(Float, nullable=True)  
 hr\_zone\_5 = Column(Float, nullable=True)

### 📄 src\db\models\athletes.py

from sqlalchemy import Column, Integer, BigInteger, String, DateTime, func  
from src.db.db\_session import Base  
  
class Athlete(Base):  
 \_\_tablename\_\_ = "athletes"  
  
 id = Column(Integer, primary\_key=True)  
 strava\_athlete\_id = Column(BigInteger, unique=True, nullable=False)  
 name = Column(String, nullable=True)  
 email = Column(String, nullable=True)  
 created\_at = Column(DateTime, server\_default=func.now())

### 📄 src\db\models\splits.py

from sqlalchemy import Column, Integer, Float, Boolean, ForeignKey, TIMESTAMP, BigInteger, String  
from sqlalchemy.sql import func  
from sqlalchemy import UniqueConstraint  
from src.db.db\_session import Base  
  
class Split(Base):  
 \_\_tablename\_\_ = "splits"  
  
 id = Column(Integer, primary\_key=True)  
 activity\_id = Column(BigInteger, ForeignKey("activities.activity\_id", ondelete="CASCADE"), nullable=False)  
 lap\_index = Column(Integer, nullable=False)  
 distance = Column(Float)  
 elapsed\_time = Column(Integer)  
 moving\_time = Column(Integer)  
 average\_speed = Column(Float)  
 max\_speed = Column(Float)  
 start\_index = Column(Integer)  
 end\_index = Column(Integer)  
 split = Column(Boolean, default=True)  
 average\_heartrate = Column(Float)   
 pace\_zone = Column(Integer)   
 created\_at = Column(TIMESTAMP, server\_default=func.now()) # <-- ✅ fixed paren  
 conv\_distance = Column(Float)  
 conv\_avg\_speed = Column(Float)  
 conv\_moving\_time = Column(String)  
 conv\_elapsed\_time = Column(String)  
  
 \_\_table\_args\_\_ = (  
 UniqueConstraint("activity\_id", "lap\_index", name="uq\_activity\_lap"),  
 )

### 📄 src\db\models\tokens.py

#models/tokens.py  
  
from sqlalchemy.orm import declarative\_base  
from sqlalchemy import Column, BigInteger, String  
  
Base = declarative\_base()  
  
class Token(Base):  
 \_\_tablename\_\_ = "tokens"  
  
 athlete\_id = Column(BigInteger, primary\_key=True)  
 access\_token = Column(String)  
 refresh\_token = Column(String)  
 expires\_at = Column(BigInteger)

### 📄 src\routes\\_\_init\_\_.py

### 📄 src\routes\activity\_routes.py

from flask import Blueprint, jsonify, request  
import os  
import traceback  
from sqlalchemy import text  
  
from src.services.activity\_service import ActivityIngestionService, run\_enrichment\_batch  
from src.db.db\_session import get\_session  
from src.db.models.activities import Activity  
  
activity\_bp = Blueprint("activity", \_\_name\_\_)  
  
# -------- Enrichment Routes --------  
  
@activity\_bp.route("/enrich/status", methods=["GET"])  
def enrich\_status():  
 """Quick health check"""  
 return jsonify({"enrich": "ok"}), 200  
  
  
@activity\_bp.route("/enrich/activity/<int:activity\_id>", methods=["POST"])  
def enrich\_single(activity\_id):  
 """Trigger enrichment for a single activity"""  
 session = get\_session()  
 try:  
 row = session.execute(  
 text("SELECT athlete\_id FROM activities WHERE activity\_id = :id"),  
 {"id": activity\_id}  
 ).fetchone()  
  
 if not row:  
 return jsonify({"error": f"Activity {activity\_id} not found"}), 404  
  
 athlete\_id = row.athlete\_id  
  
 service = ActivityIngestionService(session, athlete\_id)  
 service.enrich\_single\_activity(activity\_id) # ✅ Updated to match architectural guardrails  
  
 return jsonify({"status": f"Activity {activity\_id} enriched"}), 200  
  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify({"error": str(e)}), 500  
  
 finally:  
 session.close()  
  
  
@activity\_bp.route("/enrich/batch", methods=["POST"])  
def enrich\_batch():  
 """Enrich a batch of activities for a given athlete"""  
 athlete\_id = request.args.get("athlete\_id", type=int)  
 batch = request.args.get("batch", default=20, type=int)  
  
 if not athlete\_id:  
 return jsonify({"error": "Missing athlete\_id"}), 400  
  
 session = get\_session()  
 try:  
 enriched = run\_enrichment\_batch(session, athlete\_id, batch\_size=batch)  
 return jsonify({"status": "Batch enrichment complete", "count": enriched}), 200  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify({"error": str(e)}), 500  
 finally:  
 session.close()  
  
# -------- Sync Routes --------  
  
@activity\_bp.route("/sync/<int:athlete\_id>")  
def sync\_strava\_to\_db(athlete\_id):  
 """Strava sync endpoint secured via CRON secret"""  
 cron\_key = os.getenv("CRON\_SECRET\_KEY")  
 key = request.args.get("key")  
 if not cron\_key or key != cron\_key:  
 return jsonify(error="Unauthorized"), 401  
  
 session = get\_session()  
 try:  
 ingestion\_service = ActivityIngestionService(session, athlete\_id)  
 inserted = ingestion\_service.ingest\_recent(lookback\_days=30)  
 return jsonify(inserted=inserted), 200  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify(error="Sync failed", details=str(e)), 500  
 finally:  
 session.close()

### 📄 src\routes\admin\_routes.py

from flask import Blueprint  
  
admin\_bp = Blueprint("admin", \_\_name\_\_)  
  
@admin\_bp.route("/admin/ping")  
def ping():  
 return "pong from admin"

### 📄 src\routes\auth\_routes.py

# src/routes/auth\_routes.py  
  
from flask import Blueprint, redirect, request, jsonify  
import os  
import traceback  
import requests  
from datetime import datetime, timedelta  
import jwt  
  
from src.services.token\_service import (  
 get\_authorization\_url,  
 store\_tokens\_from\_callback,  
 refresh\_token\_if\_expired,  
 delete\_athlete\_tokens  
)  
from src.db.db\_session import get\_session  
  
auth\_bp = Blueprint("auth", \_\_name\_\_)  
  
# -------- Admin Login (Basic) --------  
  
@auth\_bp.route("/login", methods=["POST"])  
def admin\_login():  
 try:  
 data = request.get\_json()  
 username = data.get("username")  
 password = data.get("password")  
 if username == os.getenv("ADMIN\_USER") and password == os.getenv("ADMIN\_PASS"):  
 secret\_key = os.getenv("SECRET\_KEY", "dev")  
 access\_token = jwt.encode(  
 {  
 "sub": username,  
 "exp": datetime.utcnow() + timedelta(hours=1)  
 },  
 secret\_key,  
 algorithm="HS256"  
 )  
 refresh\_token = jwt.encode(  
 {  
 "sub": username,  
 "exp": datetime.utcnow() + timedelta(days=7)  
 },  
 secret\_key,  
 algorithm="HS256"  
 )  
 return jsonify({  
 "access\_token": access\_token,  
 "refresh\_token": refresh\_token  
 }), 200  
 else:  
 return jsonify({"error": "Unauthorized"}), 401  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify({"error": str(e)}), 500  
  
# -------- Strava OAuth Flow --------  
  
@auth\_bp.route("/callback")  
def callback():  
 session = get\_session()  
 try:  
 code = request.args.get("code")  
 if not code:  
 return "❌ Missing OAuth code", 400  
  
 athlete\_id = store\_tokens\_from\_callback(code, session)  
 return f"✅ Token stored for athlete\_id: {athlete\_id}", 200  
  
 except requests.exceptions.HTTPError as http\_err:  
 if http\_err.response and http\_err.response.status\_code == 400:  
 return jsonify({"error": "Invalid OAuth code or bad request"}), 401  
 traceback.print\_exc()  
 return jsonify({"error": str(http\_err)}), 502  
 except KeyError:  
 traceback.print\_exc()  
 return "❌ Strava callback data incomplete", 502  
 except Exception as e:  
 traceback.print\_exc()  
 return f"❌ Callback error: {str(e)}", 500  
 finally:  
 session.close()  
  
# -------- Token Operations --------  
  
@auth\_bp.route("/refresh/<int:athlete\_id>", methods=["POST"])  
def refresh\_token(athlete\_id):  
 session = get\_session()  
 try:  
 auth\_header = request.headers.get("Authorization", "")  
 if not auth\_header.startswith("Bearer "):  
 return jsonify({"error": "Missing or invalid Authorization header"}), 401  
  
 token = auth\_header.split(" ")[1]  
 secret\_key = os.getenv("SECRET\_KEY", "dev")  
 try:  
 jwt.decode(token, secret\_key, algorithms=["HS256"])  
 except jwt.ExpiredSignatureError:  
 return jsonify({"error": "Refresh token expired"}), 401  
 except jwt.InvalidTokenError:  
 return jsonify({"error": "Invalid token"}), 401  
  
 refreshed = refresh\_token\_if\_expired(session, athlete\_id)  
 return jsonify({"refreshed": refreshed}), 200  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify({"error": str(e)}), 500  
 finally:  
 session.close()  
  
  
  
@auth\_bp.route("/logout/<int:athlete\_id>", methods=["POST"])  
def logout(athlete\_id):  
 session = get\_session()  
 try:  
 deleted = delete\_athlete\_tokens(session, athlete\_id)  
 return jsonify({"deleted": deleted}), 200  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify({"error": str(e)}), 500  
 finally:  
 session.close()  
  
# -------- Token Monitoring --------  
  
@auth\_bp.route("/monitor-tokens", methods=["GET"])  
def monitor\_tokens():  
 session = get\_session()  
 try:  
 rows = session.execute("SELECT athlete\_id, expires\_at FROM tokens ORDER BY expires\_at").fetchall()  
 data = [{"athlete\_id": r.athlete\_id, "expires\_at": r.expires\_at} for r in rows]  
 return jsonify(data), 200  
 except Exception as e:  
 traceback.print\_exc()  
 return jsonify({"error": str(e)}), 500  
 finally:  
 session.close()

### 📄 src\scripts\\_\_init\_\_.py

### 📄 src\scripts\backfill\_athlete\_ids.py

from src.db.db\_session import get\_db\_session  
from src.db.models.athletes import Athlete  
from src.db.models.tokens import Token  
from src.db.models.activities import Activity  
from src.db.models.splits import Split  
from sqlalchemy.orm import Session  
  
def backfill\_athletes\_and\_foreign\_keys():  
 session: Session = get\_db\_session()  
  
 try:  
 # Step 1: Create missing athletes from tokens  
 tokens = session.query(Token).all()  
 for token in tokens:  
 existing = session.query(Athlete).filter\_by(strava\_athlete\_id=token.strava\_athlete\_id).first()  
 if not existing:  
 new\_athlete = Athlete(strava\_athlete\_id=token.strava\_athlete\_id)  
 session.add(new\_athlete)  
 session.flush() # get new athlete.id  
 token.athlete\_id = new\_athlete.id  
 else:  
 token.athlete\_id = existing.id  
  
 session.commit()  
 print("✅ Athlete table populated and tokens updated.")  
  
 # Step 2: Backfill activities  
 for activity in session.query(Activity).all():  
 if activity.athlete\_id is None:  
 token = session.query(Token).filter\_by(strava\_athlete\_id=activity.strava\_athlete\_id).first()  
 if token:  
 activity.athlete\_id = token.athlete\_id  
  
 session.commit()  
 print("✅ Activities updated with athlete\_id.")  
  
 # Step 3: Backfill splits  
 for split in session.query(Split).all():  
 if split.athlete\_id is None:  
 token = session.query(Token).filter\_by(strava\_athlete\_id=split.strava\_athlete\_id).first()  
 if token:  
 split.athlete\_id = token.athlete\_id  
  
 session.commit()  
 print("✅ Splits updated with athlete\_id.")  
  
 except Exception as e:  
 session.rollback()  
 print("❌ Error during backfill:", e)  
 finally:  
 session.close()  
  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 backfill\_athletes\_and\_foreign\_keys()

### 📄 src\scripts\main\_pipeline.py

# src/scripts/onboard\_and\_sync.py  
  
import argparse  
import logging  
  
from src.db.db\_session import get\_session  
from src.db.dao.token\_dao import get\_tokens\_sa  
from src.services.token\_service import get\_valid\_token  
from src.services.activity\_service import ActivityIngestionService  
from src.services.activity\_service import run\_enrichment\_batch # ✅ Correct import  
  
logging.basicConfig(level=logging.INFO)  
logger = logging.getLogger(\_\_name\_\_)  
  
def onboard\_and\_sync(athlete\_id, lookback\_days=30, batch\_size=10):  
 """  
 Full sync pipeline for onboarding + enrichment.  
 """  
  
 session = get\_session()  
  
 try:  
 logger.info(f"🚀 Starting onboard\_and\_sync for athlete {athlete\_id}")  
  
 tokens = get\_tokens\_sa(session, athlete\_id)  
  
 if not tokens:  
 raise RuntimeError(  
 f"No tokens found for athlete {athlete\_id}. "  
 "Please complete OAuth authorization first via /oauth/callback."  
 )  
  
 access\_token = get\_valid\_token(session, athlete\_id)  
 logger.info(f"🟢 Retrieved valid access token for athlete {athlete\_id}")  
  
 # ✅ Ingestion orchestrator using new ingestion service  
 ingestion\_service = ActivityIngestionService(session, athlete\_id)  
 synced\_count = ingestion\_service.ingest\_full\_history(  
 lookback\_days=lookback\_days  
 )  
 logger.info(f"✅ Synced {synced\_count} activities")  
  
 # ✅ Enrichment orchestration uses run\_enrichment\_batch()  
 enriched\_count = run\_enrichment\_batch(session, athlete\_id, batch\_size=batch\_size)  
 logger.info(f"✅ Enriched {enriched\_count} activities")  
  
 logger.info(f"🎯 Onboard and sync complete for athlete {athlete\_id}")  
  
 except Exception as e:  
 logger.exception(f"❌ Failed during onboard\_and\_sync: {e}")  
  
 finally:  
 session.close()  
  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 parser = argparse.ArgumentParser(description="Orchestrate full sync + enrichment for existing athlete")  
 parser.add\_argument("--athlete\_id", required=True, type=int)  
 parser.add\_argument("--lookback\_days", type=int, default=30)  
 parser.add\_argument("--batch\_size", type=int, default=10)  
  
 args = parser.parse\_args()  
 onboard\_and\_sync(args.athlete\_id, args.lookback\_days, args.batch\_size)

### 📄 src\services\\_\_init\_\_.py

### 📄 src\services\activity\_service.py

import time  
import logging  
from datetime import datetime, timedelta  
from sqlalchemy import text  
from sqlalchemy.exc import SQLAlchemyError  
from src.services.token\_service import get\_valid\_token  
from src.db.dao.split\_dao import upsert\_splits  
from src.db.dao.activity\_dao import upsert\_activities  
from src.services.strava\_access\_service import StravaClient  
from src.utils.logger import get\_logger  
  
log = get\_logger(\_\_name\_\_)  
log.setLevel(logging.INFO)  
  
DEFAULT\_BATCH\_SIZE = 20  
DEFAULT\_RETRY\_LIMIT = 5  
DEFAULT\_SLEEP = 5  
DEFAULT\_RETRY\_BACKOFF = 2  
DEFAULT\_LOOKBACK\_DAYS = 30  
DEFAULT\_PER\_PAGE = 200  
  
  
# --- Unit conversion helpers ---  
def meters\_to\_miles(meters):  
 return round(meters / 1609.344, 2) if meters else None  
  
def meters\_to\_feet(meters):  
 return round(meters \* 3.28084, 1) if meters else None  
  
def mps\_to\_min\_per\_mile(mps):  
 return round(26.8224 / mps, 2) if mps and mps > 0 else None  
  
def format\_seconds\_to\_hms(seconds):  
 if seconds is None:  
 return None  
 minutes, sec = divmod(seconds, 60)  
 hours, minutes = divmod(minutes, 60)  
 return f"{hours}:{minutes:02}:{sec:02}" if hours > 0 else f"{minutes}:{sec:02}"  
  
  
def get\_activities\_to\_enrich(session, athlete\_id, limit):  
 query = text("""  
 SELECT activity\_id FROM activities  
 WHERE athlete\_id = :athlete\_id  
 ORDER BY start\_date DESC  
 LIMIT :limit  
 """)  
 result = session.execute(query, {"athlete\_id": athlete\_id, "limit": limit})  
 return [row.activity\_id for row in result.fetchall()]  
  
  
def enrich\_one\_activity(session, access\_token, activity\_id):  
 try:  
 client = StravaClient(access\_token)  
 activity\_json = client.get\_activity(activity\_id)  
 zones\_data = client.get\_hr\_zones(activity\_id)  
  
 hr\_zone\_pcts = extract\_hr\_zone\_percentages(zones\_data)  
 if not hr\_zone\_pcts:  
 hr\_zone\_pcts = [0.0, 0.0, 0.0, 0.0, 0.0]  
  
 update\_activity\_enrichment(session, activity\_id, activity\_json, hr\_zone\_pcts)  
  
 splits = extract\_splits(activity\_json)  
 if splits:  
 upsert\_splits(session, splits)  
 log.info(f"✅ Synced {len(splits)} splits for activity {activity\_id}")  
  
 log.info(f"✅ Enriched activity {activity\_id}")  
 return True  
  
 except Exception as e:  
 log.error(f"🔥 Exception while enriching {activity\_id}: {e}")  
 return True  
  
  
def enrich\_one\_activity\_with\_refresh(session, athlete\_id, activity\_id):  
 try:  
 access\_token = get\_valid\_token(session, athlete\_id)  
 return enrich\_one\_activity(session, access\_token, activity\_id)  
 except Exception as e:  
 log.error(f"Failed enrichment for activity {activity\_id}: {e}")  
 return True  
  
  
def update\_activity\_enrichment(session, activity\_id, activity\_json, hr\_zone\_pcts):  
 distance\_meters = activity\_json.get("distance")  
 elevation\_meters = activity\_json.get("total\_elevation\_gain")  
 avg\_speed\_mps = activity\_json.get("average\_speed")  
 max\_speed\_mps = activity\_json.get("max\_speed")  
 moving\_time\_sec = activity\_json.get("moving\_time")  
 elapsed\_time\_sec = activity\_json.get("elapsed\_time")  
  
 conv\_distance\_miles = meters\_to\_miles(distance\_meters)  
 conv\_elevation\_feet = meters\_to\_feet(elevation\_meters)  
 conv\_avg\_speed = mps\_to\_min\_per\_mile(avg\_speed\_mps)  
 conv\_max\_speed = mps\_to\_min\_per\_mile(max\_speed\_mps)  
 conv\_moving\_time = format\_seconds\_to\_hms(moving\_time\_sec)  
 conv\_elapsed\_time = format\_seconds\_to\_hms(elapsed\_time\_sec)  
  
 params = {  
 "activity\_id": activity\_id,  
 "name": activity\_json.get("name"),  
 "distance": distance\_meters,  
 "moving\_time": moving\_time\_sec,  
 "elapsed\_time": elapsed\_time\_sec,  
 "elevation": elevation\_meters,  
 "type": activity\_json.get("type"),  
 "avg\_speed": avg\_speed\_mps,  
 "max\_speed": max\_speed\_mps,  
 "suffer\_score": activity\_json.get("suffer\_score"),  
 "average\_heartrate": activity\_json.get("average\_heartrate"),  
 "max\_heartrate": activity\_json.get("max\_heartrate"),  
 "calories": activity\_json.get("calories"),  
 "conv\_distance": conv\_distance\_miles,  
 "conv\_elevation\_feet": conv\_elevation\_feet,  
 "conv\_avg\_speed": conv\_avg\_speed,  
 "conv\_max\_speed": conv\_max\_speed,  
 "conv\_moving\_time": conv\_moving\_time,  
 "conv\_elapsed\_time": conv\_elapsed\_time,  
 "hr\_zone\_1": hr\_zone\_pcts[0],  
 "hr\_zone\_2": hr\_zone\_pcts[1],  
 "hr\_zone\_3": hr\_zone\_pcts[2],  
 "hr\_zone\_4": hr\_zone\_pcts[3],  
 "hr\_zone\_5": hr\_zone\_pcts[4],  
 }  
  
 session.execute(  
 text("""  
 UPDATE activities SET  
 name = :name,  
 distance = :distance,  
 moving\_time = :moving\_time,  
 elapsed\_time = :elapsed\_time,  
 total\_elevation\_gain = :elevation,  
 type = :type,  
 average\_speed = :avg\_speed,  
 max\_speed = :max\_speed,  
 suffer\_score = :suffer\_score,  
 average\_heartrate = :average\_heartrate,  
 max\_heartrate = :max\_heartrate,  
 calories = :calories,  
 conv\_distance = :conv\_distance,  
 conv\_elevation\_feet = :conv\_elevation\_feet,  
 conv\_avg\_speed = :conv\_avg\_speed,  
 conv\_max\_speed = :conv\_max\_speed,  
 conv\_moving\_time = :conv\_moving\_time,  
 conv\_elapsed\_time = :conv\_elapsed\_time,  
 hr\_zone\_1 = :hr\_zone\_1,  
 hr\_zone\_2 = :hr\_zone\_2,  
 hr\_zone\_3 = :hr\_zone\_3,  
 hr\_zone\_4 = :hr\_zone\_4,  
 hr\_zone\_5 = :hr\_zone\_5  
 WHERE activity\_id = :activity\_id  
 """),  
 params  
 )  
 session.commit()  
  
  
# --- MISSING COMPONENTS ADDED HERE ---  
def extract\_hr\_zone\_percentages(zones\_data):  
 try:  
 return [zone["score"] for zone in zones\_data.get("heart\_rate", {}).get("custom\_zones", [])]  
 except Exception:  
 return [0.0, 0.0, 0.0, 0.0, 0.0]  
  
def extract\_splits(activity\_json):  
 return activity\_json.get("splits\_metric", [])  
  
  
class ActivityIngestionService:  
 def \_\_init\_\_(self, session, athlete\_id):  
 self.session = session  
 self.athlete\_id = athlete\_id  
 self.access\_token = get\_valid\_token(session, athlete\_id)  
 self.client = StravaClient(self.access\_token)  
  
 def ingest\_recent(self, lookback\_days=DEFAULT\_LOOKBACK\_DAYS, max\_activities=None):  
 after = int((datetime.utcnow() - timedelta(days=lookback\_days)).timestamp())  
 activities = self.client.get\_activities(after=after, per\_page=DEFAULT\_PER\_PAGE, max\_items=max\_activities)  
 return upsert\_activities(self.session, self.athlete\_id, activities)  
  
 def ingest\_full\_history(self, lookback\_days=365, max\_activities=None):  
 return self.ingest\_recent(lookback\_days, max\_activities)  
  
 def ingest\_between(self, start\_date, end\_date, max\_activities=None):  
 after = int(start\_date.timestamp())  
 before = int(end\_date.timestamp())  
 activities = self.client.get\_activities(after=after, before=before, per\_page=DEFAULT\_PER\_PAGE, max\_items=max\_activities)  
 return upsert\_activities(self.session, self.athlete\_id, activities)  
  
  
def run\_enrichment\_batch(session, athlete\_id, batch\_size=DEFAULT\_BATCH\_SIZE):  
 activity\_ids = get\_activities\_to\_enrich(session, athlete\_id, batch\_size)  
 for aid in activity\_ids:  
 enrich\_one\_activity\_with\_refresh(session, athlete\_id, aid)

### 📄 src\services\strava\_access\_service.py

# src/services/strava\_access\_service.py  
  
import requests  
import time  
  
class StravaClient:  
 def \_\_init\_\_(self, access\_token):  
 self.access\_token = access\_token  
  
 def \_request\_with\_backoff(self, method, url, \*\*kwargs):  
 max\_retries = 5  
 backoff = 10 # Start with 10 sec backoff  
  
 for attempt in range(max\_retries):  
 response = requests.request(method, url, headers={"Authorization": f"Bearer {self.access\_token}"}, \*\*kwargs)  
  
 if response.status\_code == 429:  
 print(f"⚠️ Rate limit hit (429). Backing off {backoff} seconds...")  
 time.sleep(backoff)  
 backoff \*= 2 # Exponential backoff  
 continue  
  
 response.raise\_for\_status()  
 return response.json()  
  
 # If we exhausted retries  
 raise RuntimeError("Exceeded max retries due to repeated 429 errors")  
  
 def get\_activities(self, after=None, before=None, page=1, per\_page=200):  
 params = {"page": page, "per\_page": per\_page}  
 if after:  
 params["after"] = after  
 if before:  
 params["before"] = before  
  
 url = "https://www.strava.com/api/v3/athlete/activities"  
 return self.\_request\_with\_backoff("GET", url, params=params)  
  
 def get\_activity(self, activity\_id):  
 url = f"https://www.strava.com/api/v3/activities/{activity\_id}"  
 return self.\_request\_with\_backoff("GET", url)  
  
 def get\_hr\_zones(self, activity\_id):  
 url = f"https://www.strava.com/api/v3/activities/{activity\_id}/zones"  
 try:  
 return self.\_request\_with\_backoff("GET", url)  
 except requests.exceptions.HTTPError as e:  
 if e.response.status\_code == 404:  
 return None  
 raise  
  
 def get\_splits(self, activity\_id):  
 url = f"https://www.strava.com/api/v3/activities/{activity\_id}/laps"  
 try:  
 return self.\_request\_with\_backoff("GET", url)  
 except requests.exceptions.HTTPError as e:  
 if e.response.status\_code == 404:  
 return []  
 raise

### 📄 src\services\token\_service.py

import os  
import requests  
import urllib.parse  
import jwt  
from datetime import datetime, timedelta  
  
from flask import current\_app, has\_app\_context  
  
from src.db.dao.token\_dao import get\_tokens\_sa, insert\_token\_sa, delete\_tokens\_sa  
from src.db.db\_session import get\_engine, get\_session  
  
# ---------- Utility Constants ----------  
ACCESS\_TOKEN\_EXP = lambda: int(os.getenv("ACCESS\_TOKEN\_EXP", 900)) # 15 minutes  
REFRESH\_TOKEN\_EXP = lambda: int(os.getenv("REFRESH\_TOKEN\_EXP", 604800)) # 7 days  
  
  
# ---------- Token Management ----------  
def get\_valid\_token(session, athlete\_id):  
 token\_data = get\_tokens\_sa(session, athlete\_id)  
 if not token\_data:  
 raise RuntimeError(f"No tokens found for athlete {athlete\_id}")  
  
 if is\_expired(token\_data["expires\_at"]):  
 token\_data = refresh\_access\_token(session, athlete\_id)  
  
 return token\_data["access\_token"]  
  
def is\_expired(expires\_at):  
 now\_epoch = int(datetime.utcnow().timestamp())  
 return expires\_at <= now\_epoch  
  
def refresh\_access\_token(session, athlete\_id):  
 token\_data = get\_tokens\_sa(session, athlete\_id)  
 refresh\_token = token\_data["refresh\_token"]  
  
 tokens = refresh\_token\_static(refresh\_token)  
  
 insert\_token\_sa(  
 session=session,  
 athlete\_id=athlete\_id,  
 access\_token=tokens["access\_token"],  
 refresh\_token=tokens["refresh\_token"],  
 expires\_at=tokens["expires\_at"]  
 )  
  
 return tokens  
  
def refresh\_token\_static(refresh\_token):  
 client\_id = os.getenv("STRAVA\_CLIENT\_ID")  
 client\_secret = os.getenv("STRAVA\_CLIENT\_SECRET")  
  
 response = requests.post(  
 "https://www.strava.com/api/v3/oauth/token",  
 data={  
 "client\_id": client\_id,  
 "client\_secret": client\_secret,  
 "grant\_type": "refresh\_token",  
 "refresh\_token": refresh\_token,  
 },  
 )  
 response.raise\_for\_status()  
 return response.json()  
  
def exchange\_code\_for\_token(code):  
 client\_id = os.getenv("STRAVA\_CLIENT\_ID")  
 client\_secret = os.getenv("STRAVA\_CLIENT\_SECRET")  
 redirect\_uri = os.getenv("REDIRECT\_URI")  
  
 response = requests.post(  
 "https://www.strava.com/api/v3/oauth/token",  
 data={  
 "client\_id": int(client\_id),  
 "client\_secret": client\_secret,  
 "code": code,  
 "grant\_type": "authorization\_code",  
 "redirect\_uri": redirect\_uri  
 },  
 )  
 response.raise\_for\_status()  
 return response.json()  
  
def refresh\_token\_if\_expired(session, athlete\_id):  
 token\_data = get\_tokens\_sa(session, athlete\_id)  
 if not token\_data:  
 raise ValueError(f"No tokens found for athlete {athlete\_id}")  
  
 if is\_expired(token\_data["expires\_at"]):  
 refresh\_access\_token(session, athlete\_id)  
 return True  
 return False  
  
  
# ---------- Strava OAuth Routing ----------  
def get\_authorization\_url():  
 client\_id = os.getenv("STRAVA\_CLIENT\_ID")  
 redirect\_uri = os.getenv("STRAVA\_REDIRECT\_URI")  
  
 if not client\_id or not redirect\_uri:  
 raise ValueError("Missing STRAVA\_CLIENT\_ID or STRAVA\_REDIRECT\_URI in environment")  
  
 params = {  
 "client\_id": client\_id,  
 "response\_type": "code",  
 "redirect\_uri": redirect\_uri,  
 "approval\_prompt": "auto",  
 "scope": "read,activity:read\_all"  
 }  
  
 return f"https://www.strava.com/oauth/authorize?{urllib.parse.urlencode(params)}"  
  
def store\_tokens\_from\_callback(code, session):  
 token\_response = exchange\_code\_for\_token(code)  
  
 athlete\_id = token\_response["athlete"]["id"]  
 access\_token = token\_response["access\_token"]  
 refresh\_token = token\_response["refresh\_token"]  
 expires\_at = token\_response["expires\_at"]  
  
 insert\_token\_sa(session, athlete\_id, access\_token, refresh\_token, expires\_at)  
 return athlete\_id  
  
  
# ---------- Admin Login / JWT ----------  
def resolve\_db\_url():  
 if has\_app\_context():  
 return current\_app.config.get("DATABASE\_URL", os.getenv("DATABASE\_URL"))  
 return os.getenv("DATABASE\_URL")  
  
def login\_user(data: dict) -> tuple[str, str]:  
 username = data.get("username")  
 password = data.get("password")  
  
 if username != os.getenv("ADMIN\_USER") or password != os.getenv("ADMIN\_PASS"):  
 raise PermissionError("Invalid credentials")  
  
 now = datetime.utcnow()  
 secret = os.getenv("SECRET\_KEY", "dev")  
  
 access\_payload = {  
 "sub": username,  
 "exp": now + timedelta(seconds=ACCESS\_TOKEN\_EXP()),  
 }  
 refresh\_payload = {  
 "sub": username,  
 "exp": now + timedelta(seconds=REFRESH\_TOKEN\_EXP()),  
 }  
  
 access\_token = jwt.encode(access\_payload, secret, algorithm="HS256")  
 refresh\_token = jwt.encode(refresh\_payload, secret, algorithm="HS256")  
  
 expires\_at = int(now.timestamp()) + REFRESH\_TOKEN\_EXP()  
  
 session = get\_session()  
 insert\_token\_sa(session, athlete\_id=0, access\_token=access\_token, refresh\_token=refresh\_token, expires\_at=expires\_at)  
  
 return access\_token, refresh\_token  
  
def refresh\_token(refresh\_token\_str: str) -> str:  
 secret = os.getenv("SECRET\_KEY", "dev")  
 try:  
 payload = jwt.decode(refresh\_token\_str, secret, algorithms=["HS256"])  
 except jwt.ExpiredSignatureError:  
 raise PermissionError("Refresh token expired")  
 except jwt.InvalidTokenError:  
 raise PermissionError("Invalid refresh token")  
  
 username = payload.get("sub")  
 session = get\_session()  
 tokens = get\_tokens\_sa(session, athlete\_id=0)  
  
 if not tokens or tokens.get("refresh\_token") != refresh\_token\_str:  
 raise PermissionError("Refresh token not recognized")  
  
 now = datetime.utcnow()  
 new\_payload = {  
 "sub": username,  
 "exp": now + timedelta(seconds=ACCESS\_TOKEN\_EXP()),  
 }  
  
 return jwt.encode(new\_payload, secret, algorithm="HS256")  
  
def logout\_user(refresh\_token\_str: str) -> None:  
 # No-op  
 pass  
  
  
def delete\_athlete\_tokens(session, athlete\_id):  
 """Deletes token record for the given athlete"""  
 delete\_tokens\_sa(session, athlete\_id)  
 return True

### 📄 src\utils\generate\_gpt\_handoff\_summary.py

from docx import Document  
from docx.shared import Pt  
  
OUTPUT\_DOCX = "SmartCoach\_GPT\_Handoff\_Summary\_CLEAN.docx"  
  
def add\_heading(doc, text, level):  
 doc.add\_heading(text, level=level)  
  
def add\_paragraph(doc, text):  
 doc.add\_paragraph(text)  
  
def generate\_gpt\_handoff\_summary():  
 doc = Document()  
  
 add\_heading(doc, "✅ SmartCoach – GPT Handoff Summary", level=1)  
 add\_paragraph(doc, "This document was generated to bootstrap a Custom GPT session with complete project context.")  
  
 # Last Known Good State  
 add\_heading(doc, "🏁 Last known good state:", level=2)  
 add\_paragraph(doc, "• Tag: v1.0.0")  
 add\_paragraph(doc, "• Deployment: Railway (web-production-c4329.up.railway.app)")  
 add\_paragraph(doc, "• OAuth tested: ✅")  
 add\_paragraph(doc, "• DB Connected: ✅")  
  
 # Environment  
 add\_heading(doc, "🔐 Environment Settings:", level=2)  
 add\_paragraph(doc, "• ADMIN\_USER=admin")  
 add\_paragraph(doc, "• REDIRECT\_URI=https://web-production-c4329.up.railway.app/oauth/callback")  
 add\_paragraph(doc, "• DATABASE\_URL=(set in Railway)")  
 add\_paragraph(doc, "• SECRET\_KEY, INTERNAL\_API\_KEY, CRON\_SECRET\_KEY defined")  
  
 # Architecture  
 add\_heading(doc, "🔧 Architecture Notes:", level=2)  
 add\_paragraph(doc, "• Flask API deployed on Railway")  
 add\_paragraph(doc, "• PostgreSQL managed via Railway plugin")  
 add\_paragraph(doc, "• JWT-based authentication and user sessions")  
 add\_paragraph(doc, "• Strava OAuth 2.0 integration and webhook registration planned")  
  
 # Coaching Intelligence Objective  
 add\_heading(doc, "🎯 Coaching Intelligence Objectives:", level=2)  
 add\_paragraph(doc, "• Build personalized weekly training plans")  
 add\_paragraph(doc, "• Track Strava-recorded performance")  
 add\_paragraph(doc, "• Monitor deviations and adapt based on user behavior")  
 add\_paragraph(doc, "• Support natural conversation for advising and adjusting")  
  
 # System Components  
 add\_heading(doc, "🧱 System Components:", level=2)  
 add\_paragraph(doc, "• Custom GPT logic: planning, feedback, and conversation")  
 add\_paragraph(doc, "• PostgreSQL DB storing plan and activity data")  
 add\_paragraph(doc, "• Strava Sync service")  
 add\_paragraph(doc, "• Planned: Training plan generator, weekly comparator")  
  
 # Known Issues  
 add\_heading(doc, "⚠️ Known Issues:", level=2)  
 add\_paragraph(doc, "• None at last deploy. Strava activity fetch untested.")  
  
 # Tasks  
 add\_heading(doc, "📌 Next Tasks:", level=2)  
 add\_paragraph(doc, "1. Test full Strava flow: code -> token -> activity fetch")  
 add\_paragraph(doc, "2. Implement auto-sync")  
 add\_paragraph(doc, "3. Add athlete-to-user ID mapping")  
 add\_paragraph(doc, "4. Connect activity analysis")  
 add\_paragraph(doc, "5. Ship Phase 2 readiness")  
  
 # GPT Boot Prompt  
 add\_heading(doc, "🧠 GPT Boot Prompt", level=2)  
 add\_paragraph(doc, "Create a Custom GPT with the following context:")  
 add\_paragraph(doc, "- Name: SmartCoachDev")  
 add\_paragraph(doc, "- Role: Flask engineer + PM for Smart Marathon Coach API")  
 add\_paragraph(doc, "- Accesses: JWT auth, Strava OAuth, Railway deploy logs, pg DB")  
 add\_paragraph(doc, "- Code base starts in: /src, /templates, /scripts")  
 add\_paragraph(doc, "- Current live env: https://web-production-c4329.up.railway.app")  
 add\_paragraph(doc, "- Start by reviewing recent work, then continue with task #1: Test full Strava activity flow.")  
 add\_paragraph(doc, "- Reference: ‘Smart Coach - Project Reference.docx’ for architecture, history, and schema.")  
  
  
 from docx import Document as DocxDocument  
  
 def append\_docx\_content(target\_doc, source\_path):  
 source\_doc = DocxDocument(source\_path)  
 for element in source\_doc.element.body:  
 target\_doc.element.body.append(element)  
  
 # At the end of generate\_gpt\_handoff\_summary():  
 try:  
 append\_docx\_content(doc, "final\_project\_map.docx")  
 print("✅ Appended folder/code map from final\_project\_map.docx")  
 except Exception as e:  
 print(f"⚠️ Could not append code map: {e}")  
  
  
  
  
  
  
 doc.save(OUTPUT\_DOCX)  
 print(f"✅ Summary written to {OUTPUT\_DOCX}")  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 generate\_gpt\_handoff\_summary()

### 📄 src\utils\gpt\_ops.py

# src/utils/gpt\_ops.py  
  
import os  
from flask import Flask  
from src.db.base\_model import get\_session  
from src.db.dao.task\_dao import create\_task, update\_task\_status, delete\_task  
  
# Optional: load app context if needed  
  
def init\_flask\_context():  
 from src.app import create\_app  
 app = create\_app({"TESTING": True})  
 ctx = app.app\_context()  
 ctx.push()  
  
# Check if GPT is allowed to modify DB  
if os.getenv("GPT\_CAN\_MUTATE\_DB", "false").lower() == "true":  
 init\_flask\_context()  
else:  
 raise RuntimeError("GPT task creation is disabled by config. Set GPT\_CAN\_MUTATE\_DB=true in your .env.")  
  
  
def create\_task\_from\_gpt(title, user\_id=1, status="pending", milestone=None, labels=None, is\_icebox=False, details=None):  
 session = get\_session()  
 try:  
 task\_id = create\_task(  
 session,  
 user\_id=user\_id,  
 title=title,  
 status=status,  
 milestone=milestone,  
 labels=labels,  
 is\_icebox=is\_icebox,  
 details=details,  
 )  
 print(f"✅ GPT created task #{task\_id}: {title}")  
 return task\_id  
 except Exception as e:  
 print(f"❌ GPT failed to create task: {e}")  
 finally:  
 session.close()  
  
  
def update\_task\_status\_from\_gpt(task\_id, status=None, labels=None, is\_icebox=None, details=None):  
 session = get\_session()  
 try:  
 update\_task\_status(  
 session,  
 task\_id=task\_id,  
 status=status,  
 labels=labels,  
 is\_icebox=is\_icebox,  
 details=details,  
 )  
 print(f"✅ GPT updated task #{task\_id}")  
 except Exception as e:  
 print(f"❌ GPT failed to update task #{task\_id}: {e}")  
 finally:  
 session.close()  
  
  
def delete\_task\_by\_id\_from\_gpt(task\_id):  
 session = get\_session()  
 try:  
 delete\_task(session, task\_id)  
 print(f"🗑️ GPT deleted task #{task\_id}")  
 except Exception as e:  
 print(f"❌ GPT failed to delete task #{task\_id}: {e}")  
 finally:  
 session.close()

### 📄 src\utils\jwt\_utils.py

import jwt  
from functools import wraps  
from flask import request, jsonify, current\_app  
  
def require\_auth(f):  
 @wraps(f)  
 def decorated(\*args, \*\*kwargs):  
 # ✅ Internal service key override  
 internal\_key = request.headers.get("X-Internal-Key")  
 expected\_key = current\_app.config.get("INTERNAL\_API\_KEY")  
  
 if internal\_key and expected\_key and internal\_key == expected\_key:  
 request.user = {  
 "user\_id": "internal",  
 "is\_internal": True # ✅ FIX: enable admin privileges  
 }  
 return f(\*args, \*\*kwargs)  
  
 # 🔐 Fallback to regular Bearer token auth  
 auth\_header = request.headers.get("Authorization")  
 if not auth\_header or not auth\_header.lower().startswith("bearer "):  
 return jsonify({"error": "Authorization header missing"}), 401  
  
 token = auth\_header.split(" ")[1]  
 try:  
 secret = current\_app.config["SECRET\_KEY"]  
 payload = jwt.decode(token, secret, algorithms=["HS256"])  
  
 user\_id = payload.get("sub")  
 if not user\_id:  
 return jsonify({"error": "Token missing subject (sub)"}), 401  
  
 request.user = {  
 "user\_id": user\_id,  
 "is\_internal": user\_id == "internal" # ✅ Extend to support test tokens  
 }  
 except jwt.ExpiredSignatureError:  
 return jsonify({"error": "Token expired"}), 401  
 except jwt.InvalidTokenError:  
 return jsonify({"error": "Invalid token"}), 401  
  
 return f(\*args, \*\*kwargs)  
 return decorated  
  
  
def decode\_token(token: str, secret: str) -> dict:  
 """Decode JWT without expiration check (for internal inspection)."""  
 try:  
 return jwt.decode(token, secret, algorithms=["HS256"], options={"verify\_exp": False})  
 except jwt.DecodeError:  
 raise ValueError("Invalid token format")

### 📄 src\utils\logger.py

import logging  
  
  
def get\_logger(name=\_\_name\_\_):  
 logging.basicConfig(  
 level=logging.INFO, format="%(asctime)s %(levelname)s %(message)s"  
 )  
 return logging.getLogger(name)

### 📄 src\utils\map\_and\_extract\_Railway.py

import os  
from docx import Document  
from docx.shared import Pt, RGBColor  
from docx.oxml.ns import qn  
  
ROOT\_DIR = r"C:\Users\andre\projects\railway-pg-test"  
OUTPUT\_DOCX = "final\_project\_map.docx"  
  
EXCLUDE\_DIRS = {'venv', '\_\_pycache\_\_', '.git', '.mypy\_cache', '.pytest\_cache'}  
EXCLUDE\_SUFFIXES = {'.dist-info', '.egg-info'}  
EXCLUDE\_FILES = {'.env'}  
INCLUDE\_EXTENSIONS = {'.py', '.md', '.txt', '.html', '.css', '.js'} # Excludes JSON  
  
def should\_exclude\_dir(name):  
 return name in EXCLUDE\_DIRS or any(name.endswith(suffix) for suffix in EXCLUDE\_SUFFIXES)  
  
def should\_include\_file(entry):  
 ext = os.path.splitext(entry)[1]  
 return ext in INCLUDE\_EXTENSIONS and entry not in EXCLUDE\_FILES  
  
def icon\_for(entry, is\_dir):  
 if is\_dir:  
 return "📁"  
 elif entry.endswith(".py"):  
 return "🐍"  
 else:  
 return "📄"  
  
def read\_file\_content(filepath):  
 try:  
 with open(filepath, "r", encoding="utf-8") as f:  
 return f.readlines()  
 except:  
 return None  
  
def add\_code\_block(doc, lines):  
 para = doc.add\_paragraph()  
 para.paragraph\_format.line\_spacing = 1.0  
 para.paragraph\_format.space\_before = Pt(0)  
 para.paragraph\_format.space\_after = Pt(0)  
  
 for i, line in enumerate(lines):  
 run = para.add\_run(line if line.endswith('\n') else line + '\n')  
 run.font.name = 'Consolas'  
 run.font.size = Pt(9)  
 run.font.color.rgb = RGBColor(51, 51, 51) # #333333  
 run.\_element.rPr.rFonts.set(qn('w:eastAsia'), 'Consolas')  
  
def apply\_folder\_style(paragraph):  
 if not paragraph.runs:  
 return  
 run = paragraph.runs[0]  
 run.font.name = 'Consolas'  
 run.font.size = Pt(9)  
 run.font.color.rgb = RGBColor(51, 51, 51)  
 run.\_element.rPr.rFonts.set(qn('w:eastAsia'), 'Consolas')  
 paragraph.paragraph\_format.space\_before = Pt(0)  
 paragraph.paragraph\_format.space\_after = Pt(0)  
 paragraph.paragraph\_format.line\_spacing = 1.0  
  
def write\_project\_map(root\_dir, output\_docx):  
 doc = Document()  
 doc.add\_heading("📁 Folder & File Structure", level=1)  
  
 folder\_map\_lines = []  
 code\_blocks = []  
  
 def scan\_structure(path, level=0):  
 try:  
 entries = sorted(os.listdir(path))  
 except PermissionError:  
 return  
 for entry in entries:  
 if should\_exclude\_dir(entry):  
 continue  
 full\_path = os.path.join(path, entry)  
 is\_dir = os.path.isdir(full\_path)  
 indent = " " \* level  
 icon = icon\_for(entry, is\_dir)  
 line = f"{indent}{icon} {entry}/" if is\_dir else f"{indent}{icon} {entry}"  
 folder\_map\_lines.append(line)  
  
 if not is\_dir and should\_include\_file(entry):  
 content = read\_file\_content(full\_path)  
 if content:  
 rel\_path = os.path.relpath(full\_path, root\_dir)  
 code\_blocks.append((rel\_path, content))  
  
 if is\_dir:  
 scan\_structure(full\_path, level + 1)  
  
 folder\_map\_lines.append(f"{os.path.basename(ROOT\_DIR)}/")  
 scan\_structure(ROOT\_DIR, level=1)  
  
 # Folder tree  
 for line in folder\_map\_lines:  
 p = doc.add\_paragraph(line)  
 apply\_folder\_style(p)  
  
 doc.add\_paragraph() # spacer  
  
 # Code blocks  
 doc.add\_heading("🧠 Code & Content", level=1)  
 for rel\_path, lines in code\_blocks:  
 doc.add\_paragraph(f"📄 {rel\_path}", style='Heading3')  
 add\_code\_block(doc, lines)  
  
 doc.save(output\_docx)  
 print(f"✅ Saved clean layout to: {output\_docx}")  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 write\_project\_map(ROOT\_DIR, OUTPUT\_DOCX)

### 📄 test\_enrichment\_sync.py

from src.db.db\_session import get\_session  
from src.services.activity\_service import run\_enrichment\_batch  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 athlete\_id = 12345 # <-- replace with a valid athlete\_id from your database  
  
 session = get\_session()  
 try:  
 count = run\_enrichment\_batch(session, athlete\_id=athlete\_id)  
 print(f"✅ Enriched {count} activities")  
 finally:  
 session.close()

### 📄 tests\conftest.py

# tests/conftest.py  
  
import os  
import sys  
import pytest  
from pathlib import Path  
from sqlalchemy.orm import sessionmaker  
from dotenv import load\_dotenv  
from unittest.mock import patch  
  
# ✅ Load environment variables  
load\_dotenv()  
  
# ✅ Ensure project root is on sys.path  
sys.path.append(str(Path(\_\_file\_\_).resolve().parent.parent))  
  
from src.app import create\_app  
from src.db.db\_session import get\_engine  
  
# ✅ DATABASE\_URL for test Postgres instance  
TEST\_DATABASE\_URL = "postgresql+psycopg2://smartcoach:devpass@localhost:15432/smartcoach"  
  
# ✅ Create shared test database engine  
@pytest.fixture(scope="session")  
def shared\_engine():  
 os.environ["DATABASE\_URL"] = TEST\_DATABASE\_URL  
 engine = get\_engine(TEST\_DATABASE\_URL)  
 # 🔥 DO NOT call init\_db  
 return engine  
  
# ✅ Standard app fixture (no mocking)  
@pytest.fixture(scope="function")  
def app(shared\_engine):  
 app = create\_app({"TESTING": True, "DATABASE\_URL": TEST\_DATABASE\_URL})  
 yield app  
  
# ✅ Standard client fixture  
@pytest.fixture(scope="function")  
def client(app):  
 return app.test\_client()  
  
# ✅ SQLAlchemy session fixture  
@pytest.fixture(scope="function")  
def sqlalchemy\_session(shared\_engine):  
 connection = shared\_engine.connect()  
 transaction = connection.begin()  
 Session = sessionmaker(bind=connection, future=True)  
 session = Session()  
  
 yield session  
  
 session.close()  
 transaction.rollback()  
 connection.close()  
  
# ✅ Patched app fixture for mocking sync\_recent  
@pytest.fixture(scope="function")  
def patched\_app(monkeypatch):  
 monkeypatch.setenv("CRON\_SECRET\_KEY", "devkey123")  
  
 with patch("src.routes.sync\_routes.sync\_recent") as mock\_sync\_recent:  
 mock\_sync\_recent.return\_value = 10  
  
 app = create\_app({"TESTING": True, "DATABASE\_URL": TEST\_DATABASE\_URL})  
 yield app  
  
# ✅ Patched client fixture built on patched app  
@pytest.fixture(scope="function")  
def patched\_client(patched\_app):  
 return patched\_app.test\_client()

### 📄 tests\test\_athlete\_dao.py

import pytest  
from src.db.dao.athlete\_dao import (  
 insert\_athlete,  
 get\_athlete\_by\_strava\_id,  
 get\_athlete\_id\_from\_strava\_id  
)  
from src.db.models.athletes import Athlete  
from src.db.db\_session import get\_db\_session  
  
  
@pytest.fixture  
def clear\_athletes():  
 with get\_db\_session() as session:  
 session.query(Athlete).delete()  
 session.commit()  
 yield  
  
  
def test\_insert\_and\_fetch\_athlete(clear\_athletes):  
 strava\_id = 111222333  
 name = "Test Athlete"  
 email = "test@athlete.com"  
  
 # Insert athlete  
 inserted\_id = insert\_athlete(strava\_id, name, email)  
 assert isinstance(inserted\_id, int)  
  
 # Validate retrieval  
 athlete = get\_athlete\_by\_strava\_id(strava\_id)  
 assert athlete is not None  
 assert athlete.id == inserted\_id  
 assert athlete.name == name  
 assert athlete.email == email  
  
 # Validate ID fetch shortcut  
 id\_from\_strava = get\_athlete\_id\_from\_strava\_id(strava\_id)  
 assert id\_from\_strava == inserted\_id

### 📄 tests\test\_auth.py

import os  
import jwt  
from datetime import datetime, timedelta  
from unittest.mock import patch  
  
  
  
@patch("src.services.token\_service.refresh\_token\_static")  
def test\_login\_refresh\_logout(mock\_refresh, client):  
 """Test successful login, token refresh using Authorization header, and logout."""  
 mock\_refresh.return\_value = {  
 "access\_token": "mocked\_access",  
 "refresh\_token": "mocked\_refresh",  
 "expires\_at": int((datetime.utcnow() + timedelta(hours=1)).timestamp())  
 }  
  
 # Step 1: Login  
 resp = client.post("/auth/login", json={"username": "admin", "password": "secret"})  
 assert resp.status\_code == 200  
  
 tokens = resp.get\_json()  
 access\_token = tokens["access\_token"]  
 refresh\_token = tokens["refresh\_token"]  
  
 # 🔧 Inject mock token record into DB for athlete\_id=0  
 from src.db.models.tokens import Token  
 from src.db.db\_session import get\_session  
 session = get\_session()  
  
 with session as db\_session:  
 db\_session.add(Token(  
 athlete\_id=0,  
 access\_token="old\_access",  
 refresh\_token="mocked\_refresh",  
 expires\_at=int((datetime.utcnow() - timedelta(hours=1)).timestamp()) # expired to trigger refresh  
 ))  
 db\_session.commit()  
  
 # Step 2: Refresh (using Authorization header)  
 headers = {"Authorization": f"Bearer {refresh\_token}"}  
 resp = client.post("/auth/refresh/0", headers=headers)  
 assert resp.status\_code == 200  
  
 # Step 3: Logout  
 resp = client.post("/auth/logout/0", headers=headers)  
 assert resp.status\_code == 200  
  
  
  
def test\_invalid\_login\_rejected(client):  
 """Test that invalid credentials are rejected."""  
 resp = client.post("/auth/login", json={"username": "wrong", "password": "bad"})  
 assert resp.status\_code == 401  
  
  
def test\_invalid\_refresh\_token(client):  
 """Test that an invalid refresh token is rejected."""  
 headers = {"Authorization": "Bearer not.a.real.token"}  
 resp = client.post("/auth/refresh/0", headers=headers)  
 assert resp.status\_code == 401  
  
  
def test\_expired\_refresh\_token(client):  
 """Test refresh fails with an expired token."""  
 secret = os.environ.get("SECRET\_KEY", "testsecret")  
  
 expired\_token = jwt.encode(  
 {  
 "sub": "admin",  
 "exp": datetime.utcnow() - timedelta(seconds=1)  
 },  
 secret,  
 algorithm="HS256"  
 )  
  
 resp = client.post("/auth/refresh/0", headers={"Authorization": f"Bearer {expired\_token}"})  
 print(f"⏰ Expired refresh status: {resp.status\_code}, Body: {resp.data.decode()}")  
 assert resp.status\_code == 401

### 📄 tests\test\_enrichment\_with\_splits.py

import pytest  
from unittest.mock import patch  
from datetime import datetime  
  
from src.db.models.activities import Activity  
from src.db.models.splits import Split  
from src.services.activity\_service import enrich\_one\_activity\_with\_refresh  
  
# ✅ Sample activity data  
SAMPLE\_ACTIVITY\_JSON = {  
 "id": 99999,  
 "name": "Mock Run",  
 "type": "Run",  
 "distance": 5000.0,  
 "moving\_time": 1500,  
 "elapsed\_time": 1600,  
 "total\_elevation\_gain": 50.0,  
 "average\_speed": 3.5,  
 "max\_speed": 4.0,  
 "suffer\_score": 30,  
 "average\_heartrate": 150,  
 "max\_heartrate": 170,  
 "calories": 400,  
 "laps": [  
 {  
 "split\_index": 1,  
 "distance": 1000,  
 "elapsed\_time": 300,  
 "moving\_time": 295,  
 "average\_speed": 3.33,  
 "max\_speed": 3.5,  
 "start\_index": 0,  
 "end\_index": 299,  
 "split": True  
 }  
 ]  
}  
  
SAMPLE\_HR\_ZONE\_RESPONSE = [  
 {  
 "type": "heartrate",  
 "distribution\_buckets": [  
 {"min": 90, "max": 110, "time": 60},  
 {"min": 110, "max": 130, "time": 120},  
 {"min": 130, "max": 150, "time": 180},  
 {"min": 150, "max": 170, "time": 240},  
 {"min": 170, "max": 190, "time": 300}  
 ]  
 }  
]  
  
@pytest.fixture  
def seed\_activity(sqlalchemy\_session):  
 athlete\_id = 42  
 activity = Activity(  
 activity\_id=99999,  
 athlete\_id=athlete\_id,  
 start\_date=datetime.utcnow()  
 )  
 sqlalchemy\_session.add(activity)  
 sqlalchemy\_session.commit()  
 return activity  
  
# ✅ Patching based on how it's imported in `activity\_service`  
@patch("src.services.activity\_service.get\_valid\_token", return\_value="dummy\_access")  
@patch("src.services.strava\_access\_service.StravaClient.get\_activity")  
@patch("src.services.strava\_access\_service.StravaClient.get\_hr\_zones")  
def test\_enrich\_one\_activity\_with\_splits(mock\_get\_hr\_zones, mock\_get\_activity, mock\_get\_token, sqlalchemy\_session, seed\_activity):  
 mock\_get\_activity.return\_value = SAMPLE\_ACTIVITY\_JSON  
 mock\_get\_hr\_zones.return\_value = SAMPLE\_HR\_ZONE\_RESPONSE  
  
 athlete\_id = seed\_activity.athlete\_id  
  
 result = enrich\_one\_activity\_with\_refresh(sqlalchemy\_session, athlete\_id, activity\_id=99999)  
 assert result is True  
  
 splits = sqlalchemy\_session.query(Split).filter\_by(activity\_id=99999).all()  
 assert len(splits) == 1  
 assert splits[0].lap\_index == 1  
 assert splits[0].distance == 1000  
 assert splits[0].elapsed\_time == 300  
  
 activity = sqlalchemy\_session.query(Activity).filter\_by(activity\_id=99999).one()  
 assert activity.hr\_zone\_1\_pct is not None  
 assert activity.hr\_zone\_5\_pct is not None

### 📄 tests\test\_health.py

# tests/test\_health.py  
def test\_ping(client):  
 resp = client.get("/ping")  
 assert resp.status\_code == 200  
 assert resp.data == b"pong"

### 📄 tests\test\_hr\_zone\_api.py

import os  
import requests  
  
# Replace with a valid activity\_id you know has HR data  
activity\_id = 14663194187 # <-- replace with one of your existing IDs  
  
# Read access token directly from database or environment  
access\_token = os.getenv("STRAVA\_ACCESS\_TOKEN")  
  
if not access\_token:  
 raise RuntimeError("Missing STRAVA\_ACCESS\_TOKEN environment variable")  
  
url = f"https://www.strava.com/api/v3/activities/{activity\_id}/zones"  
headers = {"Authorization": f"Bearer {access\_token}"}  
  
resp = requests.get(url, headers=headers, timeout=10)  
print(f"HTTP Status: {resp.status\_code}")  
  
if resp.status\_code == 200:  
 data = resp.json()  
 print("✅ Successfully fetched HR zone data:")  
 print(data)  
else:  
 print("❌ Failed to fetch HR zones.")  
 print(resp.text)

### 📄 tests\test\_oauth\_flow.py

import os  
import requests  
from unittest.mock import patch, Mock  
  
  
def test\_oauth\_callback\_missing\_code(client):  
 resp = client.get("/auth/callback")  
 assert resp.status\_code == 400  
  
  
@patch("requests.post")  
def test\_oauth\_callback\_strava\_http\_error(mock\_post, client):  
 mock\_response = Mock()  
 mock\_response.raise\_for\_status.side\_effect = requests.exceptions.HTTPError("Strava error")  
 mock\_response.text = "Bad Request"  
 mock\_post.return\_value = mock\_response  
  
 resp = client.get("/auth/callback?code=badcode")  
 assert resp.status\_code == 502  
  
  
@patch("requests.post")  
def test\_oauth\_callback\_incomplete\_response(mock\_post, client):  
 mock\_response = Mock()  
 mock\_response.raise\_for\_status.return\_value = None  
 mock\_response.json.return\_value = {"athlete": {}}  
 mock\_post.return\_value = mock\_response  
  
 resp = client.get("/auth/callback?code=incomplete")  
 assert resp.status\_code == 502  
  
  
def test\_oauth\_callback\_missing\_env(monkeypatch, client):  
 monkeypatch.delenv("STRAVA\_CLIENT\_ID", raising=False)  
 monkeypatch.delenv("STRAVA\_CLIENT\_SECRET", raising=False)  
 monkeypatch.delenv("REDIRECT\_URI", raising=False)  
  
 resp = client.get("/auth/callback?code=fakecode")  
 assert resp.status\_code == 500

### 📄 tests\test\_split\_dao.py

# tests/test\_split\_dao.py  
  
import pytest  
from src.db.dao.split\_dao import upsert\_splits  
from src.db.models.splits import Split  
from src.db.models.activities import Activity # ✅ Import Activity to insert FK parent  
  
def test\_upsert\_splits\_basic(sqlalchemy\_session):  
 # ✅ Insert parent Activity row to satisfy ForeignKey constraint  
 sqlalchemy\_session.add(Activity(activity\_id=123, athlete\_id=1))  
 sqlalchemy\_session.commit()  
  
 splits = [  
 {  
 "activity\_id": 123,  
 "lap\_index": 1,  
 "distance": 1000.0,  
 "elapsed\_time": 300,  
 "moving\_time": None,  
 "average\_speed": 3.33,  
 "max\_speed": None,  
 "start\_index": None,  
 "end\_index": None,  
 "split": True  
 },  
 {  
 "activity\_id": 123,  
 "lap\_index": 2,  
 "distance": 1000.0,  
 "elapsed\_time": 320,  
 "moving\_time": None,  
 "average\_speed": 3.12,  
 "max\_speed": None,  
 "start\_index": None,  
 "end\_index": None,  
 "split": True  
 }  
 ]  
  
 # ✅ Perform the upsert  
 inserted = upsert\_splits(sqlalchemy\_session, splits)  
 assert inserted == 2  
  
 # ✅ Verify inserted rows  
 rows = sqlalchemy\_session.query(Split).filter\_by(activity\_id=123).order\_by(Split.lap\_index).all()  
 assert len(rows) == 2  
 assert rows[0].lap\_index == 1  
 assert rows[0].distance == 1000.0  
 assert rows[0].elapsed\_time == 300  
 assert rows[0].average\_speed == 3.33

### 📄 tests\test\_split\_upsert\_idempotency.py

# tests/test\_split\_upsert\_idempotency.py  
  
from src.db.models.activities import Activity  
from src.db.dao.split\_dao import upsert\_splits  
from src.db.models.splits import Split  
  
def test\_upsert\_splits\_idempotency(sqlalchemy\_session):  
 # Insert parent activity  
 activity\_id = 55555  
 sqlalchemy\_session.add(Activity(activity\_id=activity\_id, athlete\_id=1))  
 sqlalchemy\_session.commit()  
  
 splits = [  
 {  
 "activity\_id": activity\_id,  
 "lap\_index": 1,  
 "distance": 1000.0,  
 "elapsed\_time": 300,  
 "moving\_time": 290,  
 "average\_speed": 3.3,  
 "max\_speed": 3.5,  
 "start\_index": 0,  
 "end\_index": 299,  
 "split": True  
 }  
 ]  
  
 # First insert  
 inserted = upsert\_splits(sqlalchemy\_session, splits)  
 assert inserted == 1  
  
 # Second insert (should conflict-update, not duplicate)  
 inserted\_again = upsert\_splits(sqlalchemy\_session, splits)  
 assert inserted\_again == 1  
  
 # Verify only 1 row exists  
 rows = sqlalchemy\_session.query(Split).filter\_by(activity\_id=activity\_id).all()  
 assert len(rows) == 1

### 📄 tests\test\_sync.py

from unittest.mock import patch, MagicMock  
  
@patch("src.services.activity\_service.StravaClient")  
@patch("src.services.activity\_service.get\_valid\_token", return\_value="fake-token")  
@patch("src.services.activity\_service.run\_enrichment\_batch", return\_value=1)  
@patch("src.routes.activity\_routes.ActivityIngestionService") # ✅ Patch from where it's used  
def test\_sync\_success(mock\_ingestor, mock\_enrich, mock\_token, mock\_strava, client):  
 instance = mock\_ingestor.return\_value  
 instance.ingest\_recent.return\_value = 5  
 mock\_strava.return\_value.get\_activities.return\_value = []  
  
 resp = client.get("/sync/sync/123?key=devkey123")  
 assert resp.status\_code == 200  
 assert resp.json == {"inserted": 5}

### 📄 tests\utils.py

import jwt  
import datetime  
  
def generate\_test\_token(user\_id, secret\_key, expires\_in=3600):  
 payload = {  
 "sub": user\_id,  
 "exp": datetime.datetime.utcnow() + datetime.timedelta(seconds=expires\_in)  
 }  
 return jwt.encode(payload, secret\_key, algorithm="HS256")

### 📄 wsgi.py

from src.app import create\_app  
app = create\_app()