

Technical Project Overview: Rewards Redemption Optimizer

Week 2 (June 16 - 20): Working With and Building Data Pipelines

This is a group-based assignment, meaning that your group will be working together to submit each deliverable. Deadline is **Friday, June 20 at 11:59PM**. Please report to your PM if you have any questions or concerns.

Objectives

- Connect to travel APIs; collect sample data
- Build data pipeline for flight and award information
- Create a basic data storage and retrieval system
- Understand “synthetic routing” (which will be important for next week)

Deliverables

- API Integration and Python scripts: Tool for retrieving, processing, storing travel data
- Sample datasets for one example month for the 3-5 routes you chose last week
- Document briefing about “synthetic routing”

Instructions

1. Connect to travel APIs
 - *Think of an API as a tool that lets your computer “talk” to a travel website (like Skyscanner) to get data about flights.*
 - You’ll:
 - Use Python to write code that connects to a free travel API
 - Get info like flight prices, airlines, flight times, and dates
 - Some APIs to try:
 - [Amadeus](#) (NDC)
 - [Skyscanner](#)
2. Collect flight data
 - Pick 3-5 travel routes (you should’ve picked these last week, like “Boston → San Francisco”)
 - For each one:
 - Collect at least one month of flight data
 - Save details like price, airline, time, and date
 - Find a method to save your data, one example could be with [SQLite](#), a simple local database (like a folder where Python can save your info)
3. Research “synthetic routing”
 - *This means finding creative travel routes that are cheaper than the obvious ones. You’ll research this idea and find real examples.*

- Example:
 - A direct flight from A → C costs \$400
 - But A → B → C (with a layover) only costs \$250
- You'll:
 - Read about “synthetic routing” and “hidden city ticketing”
 - Find 5-10 examples where adding a stop is cheaper
 - Make a list of cities where this trick works often
- 4. Write a short report compiling all your scripts and deliverables
Rove_W2_YourSlackTeamCode (e.g., Rove_W2_Y1T)

Resources

- Free APIs on airline award charts, travel pricing: [Amadeus](#) (NDC), [Skyscanner](#)
- Store databases locally using [SQLite](#)
- Articles on “synthetic routing, hidden city ticketing” ([ScienceDirect](#), [Vice](#), [NYTimes](#))

5 Week Project Scope

Students will build a tool that helps users identify the highest-value redemption options for loyalty points or miles. Using public data on airline award charts, travel pricing, and miles valuations (e.g., from sites like UpgradedPoints or The Points Guy), students will create a basic algorithm to estimate value-per-mile for different redemption paths (e.g., economy flight vs. hotel booking vs. gift card).

The tool will include a user-facing interface where someone can enter a destination, travel dates, and number of miles, and receive suggested redemptions ranked by estimated value. Bonus points for visualizing redemptions on a map or allowing flexible filters like “maximize value” or “minimum fees.”

Expected Deliverables (by the end of this program session)

- Research on GDS vs NDC capabilities for flight bookings. Pros and cons of each technology.
- Connect to a GDS or NDC API and pull data for an example month
- Python-based or no-code web tool that suggests optimal travel redemptions based on creating “artificial layovers” (also known as synthetic routing, two separate flights with the same middle point that are cheaper than direct tickets).
- Interface mockup or working UI (e.g., in Replit, Streamlit, or Figma)
- Final slide deck with demo, logic explanation, and future improvements