Assignment 1

1. Student Class  
Base Attributes: Student ID, Name, Date of Birth, Gender, Address, Phone, Email, Enrollment Year, Program, Major, GPA History, Academic Standing, Credit Hours Attempted, Full/Part‑Time Status, Scholarship Status, Emergency Contact, Dorm, Meal Plan, Nationality, Blood Group, Learning Disabilities

University Portal View  
Uses: ID, Name, Program, Major, GPA, Enrollment Year, Academic Standing

Housing/Meals View  
Uses: ID, Name, Dorm, Meal Plan, Emergency Contact, Disabilities

Registrar/Graduation Office  
Uses: ID, Name, Program, Total Credits, Graduation Year, GPA History

**2. Flight / Passenger Record**

*(Based on PNR and airline reservation systems)*  
**Base Attributes:** Flight No., Aircraft ID, Airline Code, Departure Airport, Arrival Airport, Scheduled/Actual Departure & Arrival Times, Passenger List, Seat Numbers, Booking Class, Fare Code, Ticket Number, Passenger Name, Passport No., Frequent‑Flyer Tier, Meal Preference (veg/veg no onion), Wheelchair Assistance, Seat Preference, Connecting Flights, Baggage Allowance, Special Service Requests (SSR)

**Passenger Booking System**  
Uses: Flight No., Departure/Arrival, Passenger Name, Seat No., Fare Class, SSRs (e.g. “VGML vegetarian meal”), Ticket No.

**On‑Board Operations System**  
Uses: Flight No., Seat Map, Passenger Name, Wheelchair Flag, Meal Preference**Revenue/Fare Management System**  
Uses: Fare Code, Ticket Price, Booking Class, Booking Channel, Adjusted Fare

**3. Vehicle (Rental/Fleet Tracker)**

*(Common OOP vehicle attributes)*  
**Base Attributes:** VIN, Make, Model, Year, Engine Type (e.g. 2.0T Otto), Fuel Type, GPS Location, Odometer, Fuel Level, Tire Pressures (FL/FR/RL/RR), Transmission Type, Driver Name, Rental Status, Service History, Current Mileage, Insurance Status, Estimated Return Date, Emission Rating, GPS Firmware, Color, Registration No.

**Rental Booking System**  
Uses: VIN, Make‑Model, Year, Fuel Level, Current Location, Odometer, Rental Status

**Maintenance System**  
Uses: VIN, Odometer, Service History, Tire Pressures, Engine Type, Oil Change Needed

**Insurance Risk Assessment System**  
Uses: VIN, Year, Make, Emission Rating, Current Mileage, Accident History (flag), Vehicle Configuration

**4. BankAccount (Digital Banking)**

**Base Attributes:** Account Number, Customer ID, Balance, Currency, Account Open Date, Account Type (Savings/Checking), Overdraft Limit, Interest Rate, Branch ID, KYC Documents, Email, Phone, Address, Daily Withdrawal Limit, PIN/TAN Setup, Transaction History, EFT Enabled Flag, Standing Instructions, Virtual Card Flag, IBAN Number

**ATM Withdrawal System**  
Uses: Account Number, PIN/TAN, Balance, Daily Limit, Account Status

**Internet Banking Portal**  
Uses: Account Number, Balance, Transaction History, eStatements, Email, Phone

**Fraud Detection System**  
Uses: Transaction History, Withdrawal Limit, Daily Usage Pattern, KYC Info, Overdraft Usage, Fraud Flags

**5. HR Employee / Person Entity**

*(Combining HRIS fields per SAP or Zoho People)*  
**Base Attributes:** Employee ID, Name, DOB, Gender, Nationality, Marital Status, Address (Home/Present), Email, Phone, PAN/Aadhar/UAN/SSN, Emergency Contact, Bank Account No., Department, Designation, Join Date, Blood Group, Educational Qualifications, Years of Experience, Certifications, Languages Spoken, Wellness Program Status, Physical Disabilities, Salary, Benefits, Training History

**HR Portal View**  
Uses: Employee ID, Name, Join Date, Department, Designation, Salary, Reporting Manager

**Employee Self-Service View**  
Uses: Name, DOB, Phone, Address, Emergency Contact, Leave Balance, Wellness Status

**Payroll System View**  
Uses: Employee ID, Salary, Bank Account No., Tax IDs, Benefits, Joining Date

**6. SmartHomeDevice (e.g. smart bulb / thermostat)**

**Base Attributes:** Device ID, Model, Firmware, MAC Address, RSSI/Signal Strength, IP Address, Room Location, On!/Off State, Brightness Level, Colour (HSL or CCT + shade), Power Usage, Last Update Timestamp, OTA Update History, Energy‑Save Mode, Hub ID, Motion Sensor Enabled, Firmware Version, Alert Settings, Temperature Readout, User Label, Battery Level (if wireless), Last Blink/Tested

**Voice‑Assistant App View**  
Uses: On/Off, Brightness, Colour, Room Location, Device Name

**Energy Monitor Dashboard**  
Uses: Power Usage, On/Off Cycle History, Firmware Version, Device ID, Hub ID, Signal Quality

**Diagnostics/OTA System**  
Uses: Device ID, Firmware Version, MAC Address, Update History, Manufacturer, Boot Log

**7. Patient (Electronic Health Record)**

**Base Attributes:** Patient ID, Full Name, DOB, Gender, Address, Phone, Email, Emergency Contact, Blood Group, Allergies, Medical Conditions, Current Medications, Height, Weight, Smoking Status, Primary Language, Insurance Provider & Policy No., Hospital #  
Admission Record, Treatment History, Lab Results, Imaging Files, Surgery History, Dietary Restrictions, Disability Status, Marital Status, Job Profile

**Clinical View (Doctor/Nurse EHR)**  
Uses: Name, Age, Gender, Allergies, Medications, Medical Conditions, Recent Lab Results, Dietary Restrictions, Emergency Contact

**Billing/Claims View**  
Uses: Patient ID, Name, Insurance Info, Treatments/Procedures, Dates In/Out, Room Rate, Medications Charged

**Research/Registry View (de-identified)**  
Uses: Age Group, Gender, Blood Group, Conditions, Outcome Stats (non‑PII form)

**8. Product (E‑Commerce Catalog Item)**

**Base Attributes:** SKU, Name, Brand, Category, Price, Cost, Discount, Stock Level, Supplier ID, Weight, Dimensions, UPC/Barcode, Warranty Info, Ratings, Review Count, Launch Date, Batch/Expiry (if food), Eco‑Certifications, Material, Colour, Customer Favourites List, Sales Rank, View Count, Warranty Period

**Catalog/Frontend System**  
Uses: SKU, Name, Brand, Price, Rating, Stock Level (yes/no), Discount, Category

**Inventory/Reorder System**  
Uses: SKU, Stock Level, Supplier ID, Cost, UPC, Weight/Dimensions, Reorder Threshold

**Review Analytics System**  
Uses: SKU, Ratings, Review Count, Launch Date, Sales Rank, Category

**9. LibraryBook Entity**

**Base Attributes:** ISBN, Title, Authors, Publisher, Published Date, Edition, Language, Genre, Number of Pages, Cover Type, Library Classification (Dewey), Barcode ID, Acquisition Date, Last Checkout Date, Condition, Shelf Location, Popularity Score, eBook File Link, Digital Rights, Overdue Flag, Borrower History, Translator, Illustrator, Abridged Version Flag

**Library Catalog View**  
Uses: ISBN, Title, Author, Publisher, Published Date, Edition, Shelf Location, Availability

**Online Retail Store View**  
Uses: ISBN, Title, Author, Publisher, Retail Price, Reviews, Genre, eBook File (e‑version), Language

**Publisher Metadata Management**  
Uses: ISBN, Edition, Translator, Illustrator, Region, Rights Expiry, Batch Info

**10. IoTSensor (Environmental Monitoring)**

**Base Attributes:** Sensor ID, Type (Temp/Vibration), Location GPS, Measurement Units, Current Reading, Min/Max Safe Range, Alert Thresholds, Firmware Version, Last Calibration Date, Battery Level, Uptime, Signal Strength, Installation Date, Configuration Step, Owner ID, Data Transmission Rate, Event Log, Serial Number, Firmware History

**Dashboard for Operators**  
Uses: Sensor ID, Current Reading, Battery Level, Signal Strength, Uptime, Location

**Alert System**  
Uses: Sensor ID, Reading vs Threshold, Alert Logs, Timestamp, Min/Max Range

**Maintenance Analysis System**  
Uses: Sensor ID, Firmware Version, Calibration History, Event Log, Uptime, Installation Date