* Usamos la inteligencia artificial “Amazon CodeWhisperer” (Actualmente Amazon Q).
* Previamente debemos traducir las instrucciones al inglés, ya que esta solo entiende ese idioma.

**Problema NOR1**

1. “I need to create 3 classes, city, with attributes: String name, Int population, double collectedAmount, double, maintenanceExpense, and methods: constructor,getter and setter for every attribute”

Le decimos que vamos a necesitar que nos cree 3 clases, y le vamos pasando los atributos y metodos para la clase ciudad y luego le pasaremos para las otras dos clases

package ProblemaNor1;  
  
public class City {  
 private String name;  
 private int population;  
 private double collectedAmount;  
 private double maintenanceExpense;  
  
 // Constructor  
 public City(String name, int population, double collectedAmount, double maintenanceExpense) {  
 this.name = name;  
 this.population = population;  
 this.collectedAmount = collectedAmount;  
 this.maintenanceExpense = maintenanceExpense;  
 }  
  
 // Getters  
 public String getName() {  
 return name;  
 }  
  
 public int getPopulation() {  
 return population;  
 }  
  
 public double getCollectedAmount() {  
 return collectedAmount;  
 }  
  
 public double getMaintenanceExpense() {  
 return maintenanceExpense;  
 }  
  
 // Setters  
 public void setName(String name) {  
 this.name = name;  
 }  
  
 public void setPopulation(int population) {  
 this.population = population;  
 }  
  
 public void setCollectedAmount(double collectedAmount) {  
 this.collectedAmount = collectedAmount;  
 }  
  
 public void setMaintenanceExpense(double maintenanceExpense) {  
 this.maintenanceExpense = maintenanceExpense;  
 }  
}

1. “tax with attributes: String type, double collectedAmount, methods: constructor, getter and setter”

package ProblemaNor1;  
  
public class Tax {  
 private String type;  
 private double collectedAmount;  
  
 // Constructor  
 public Tax(String type, double collectedAmount) {  
 this.type = type;  
 this.collectedAmount = collectedAmount;  
 }  
  
 // Getters  
 public String getType() {  
 return type;  
 }  
  
 public double getCollectedAmount() {  
 return collectedAmount;  
 }  
  
 // Setters  
 public void setType(String type) {  
 this.type = type;  
 }  
  
 public void setCollectedAmount(double collectedAmount) {  
 this.collectedAmount = collectedAmount;  
 }  
}

1. “country: list <City>cityList  
   methods: addCity( City city):adds a city to the cityList.  
   calculateDeficit(): identifies the cities which spend more than they collect  
   calculateProvincesWithDeficit(): identifies the provinces who have more than half of the cities with deficit”

package ProblemaNor1;  
  
import java.util.ArrayList;  
import java.util.List;  
  
public class Country {  
 private List<City> cityList;  
  
 public Country() {  
 cityList = new ArrayList<>();  
 }  
  
 public void addCity(City city) {  
 cityList.add(city);  
 }  
  
 public List<City> calculateDeficit() {  
 List<City> citiesWithDeficit = new ArrayList<>();  
 for (City city : cityList) {  
 if (city.getMaintenanceExpense() > city.getCollectedAmount()) {  
 citiesWithDeficit.add(city);  
 }  
 }  
 return citiesWithDeficit;  
 }  
  
 public List<String> calculateProvincesWithDeficit() {  
 List<String> provincesWithDeficit = new ArrayList<>();  
 // Assuming provinces are identified by the first two characters of the city name  
 for (int i = 0; i < cityList.size(); i += 2) {  
 String province = cityList.get(i).getName().substring(0, 2);  
 int citiesWithDeficit = 0;  
 for (int j = i; j < cityList.size() && cityList.get(j).getName().startsWith(province); j++) {  
 if (cityList.get(j).getMaintenanceExpense() > cityList.get(j).getCollectedAmount()) {  
 citiesWithDeficit++;  
 }  
 }  
 if (citiesWithDeficit > cityList.size() / 4) {  
 provincesWithDeficit.add(province);  
 }  
 }  
 return provincesWithDeficit;  
 }  
}

1. “Create a main for the previous exercise”

package ProblemaNor1;  
  
import java.util.List;  
  
public class Main {  
 public static void main(String[] args) {  
 // Create some cities  
 City city1 = new City("New York", 8623000, 1000000.0, 1200000.0);  
 City city2 = new City("Los Angeles", 3971000, 800000.0, 900000.0);  
 City city3 = new City("Chicago", 2693000, 700000.0, 600000.0);  
 City city4 = new City("Houston", 2320000, 500000.0, 550000.0);  
  
 // Create some taxes  
 Tax incomeTax = new Tax("Income Tax", 500000.0);  
 Tax salesTax = new Tax("Sales Tax", 300000.0);  
  
 // Create a country and add cities  
 Country country = new Country();  
 country.addCity(city1);  
 country.addCity(city2);  
 country.addCity(city3);  
 country.addCity(city4);  
  
 // Calculate cities with deficit  
 List<City> citiesWithDeficit = country.calculateDeficit();  
 System.*out*.println("Cities with Deficit:");  
 for (City city : citiesWithDeficit) {  
 System.*out*.println(city.getName());  
 }  
  
 // Calculate provinces with deficit  
 List<String> provincesWithDeficit = country.calculateProvincesWithDeficit();  
 System.*out*.println("\nProvinces with Deficit:");  
 for (String province : provincesWithDeficit) {  
 System.*out*.println(province);  
 }  
  
 // Print tax information  
 System.*out*.println("\nTax Information:");  
 System.*out*.println("Income Tax Collected: $" + incomeTax.getCollectedAmount());  
 System.*out*.println("Sales Tax Collected: $" + salesTax.getCollectedAmount());  
 }  
}

Podemos concluir que si bien cumplió con el ejercicio y nos devuelve q ciudades son las que tienen mas déficit, fallo a la hora de crear los 5 impuestos, para arreglarlo, simplemente deberíamos crear 5 objetos de tipo “TAX” para que el programa pueda utilizarlos.

**Problema NOR 2**

1. “Create classes with this attributes and methods:”

package ProblemaNor2;  
  
public class Hangar {  
 private int number;  
 private int capacity;  
 private String location;  
  
 // Constructor  
 public Hangar(int number, int capacity, String location) {  
 this.number = number;  
 this.capacity = capacity;  
 this.location = location;  
 }  
  
 // Getters  
 public int getNumber() {  
 return number;  
 }  
  
 public int getCapacity() {  
 return capacity;  
 }  
  
 public String getLocation() {  
 return location;  
 }  
  
 // Setters  
 public void setNumber(int number) {  
 this.number = number;  
 }  
  
 public void setCapacity(int capacity) {  
 this.capacity = capacity;  
 }  
  
 public void setLocation(String location) {  
 this.location = location;  
 }  
}

package ProblemaNor2;  
  
import java.util.ArrayList;  
  
public class Mechanic {  
 private double salary;  
 private String shift;  
 private ArrayList<PlaneType> authorizedPlaneTypes;  
  
 // Constructor  
 public Mechanic(double salary, String shift, ArrayList<PlaneType> authorizedPlaneTypes) {  
 this.salary = salary;  
 this.shift = shift;  
 this.authorizedPlaneTypes = authorizedPlaneTypes;  
 }  
  
 // Getters  
 public double getSalary() {  
 return salary;  
 }  
  
 public String getShift() {  
 return shift;  
 }  
  
 public ArrayList<PlaneType> getAuthorizedPlaneTypes() {  
 return authorizedPlaneTypes;  
 }  
  
 // Setters  
 public void setSalary(double salary) {  
 this.salary = salary;  
 }  
  
 public void setShift(String shift) {  
 this.shift = shift;  
 }  
  
 public void setAuthorizedPlaneTypes(ArrayList<PlaneType> authorizedPlaneTypes) {  
 this.authorizedPlaneTypes = authorizedPlaneTypes;  
 }  
}

package ProblemaNor2;  
  
public class Person {  
 private String DNI;  
 private String name;  
 private String address;  
 private String phoneNumber;  
  
 // Constructor  
 public Person(String DNI, String name, String address, String phoneNumber) {  
 this.DNI = DNI;  
 this.name = name;  
 this.address = address;  
 this.phoneNumber = phoneNumber;  
 }  
  
 // Getters  
 public String getDNI() {  
 return DNI;  
 }  
  
 public String getName() {  
 return name;  
 }  
  
 public String getAddress() {  
 return address;  
 }  
  
 public String getPhoneNumber() {  
 return phoneNumber;  
 }  
  
 // Setters  
 public void setDNI(String DNI) {  
 this.DNI = DNI;  
 }  
  
 public void setName(String name) {  
 this.name = name;  
 }  
  
 public void setAddress(String address) {  
 this.address = address;  
 }  
  
 public void setPhoneNumber(String phoneNumber) {  
 this.phoneNumber = phoneNumber;  
 }  
}

package ProblemaNor2;  
  
import java.util.ArrayList;  
  
public class Pilot {  
 private String licenseNumber;  
 private String restrictions;  
 private ArrayList<PlaneType> authorizedPlaneTypes;  
  
 // Constructor  
 public Pilot(String licenseNumber, String restrictions, ArrayList<PlaneType> authorizedPlaneTypes) {  
 this.licenseNumber = licenseNumber;  
 this.restrictions = restrictions;  
 this.authorizedPlaneTypes = authorizedPlaneTypes;  
 }  
  
 // Getters  
 public String getLicenseNumber() {  
 return licenseNumber;  
 }  
  
 public String getRestrictions() {  
 return restrictions;  
 }  
  
 public ArrayList<PlaneType> getAuthorizedPlaneTypes() {  
 return authorizedPlaneTypes;  
 }  
  
 // Setters  
 public void setLicenseNumber(String licenseNumber) {  
 this.licenseNumber = licenseNumber;  
 }  
  
 public void setRestrictions(String restrictions) {  
 this.restrictions = restrictions;  
 }  
  
 public void setAuthorizedPlaneTypes(ArrayList<PlaneType> authorizedPlaneTypes) {  
 this.authorizedPlaneTypes = authorizedPlaneTypes;  
 }  
}

package ProblemaNor2;  
  
import java.util.ArrayList;  
import java.util.Date;  
  
public class Plane {  
 private String registrationNumber;  
 private PlaneType type;  
 private Hangar hangar;  
 private ArrayList<Person> owners;  
 private Date acquisitionDate;  
 private ArrayList<Service> servicesPerformed;  
  
 // Constructor  
 public Plane(String registrationNumber, PlaneType type, Hangar hangar, ArrayList<Person> owners, Date acquisitionDate) {  
 this.registrationNumber = registrationNumber;  
 this.type = type;  
 this.hangar = hangar;  
 this.owners = owners;  
 this.acquisitionDate = acquisitionDate;  
 this.servicesPerformed = new ArrayList<>();  
 }  
  
 // Getters and Setters  
 public String getRegistrationNumber() {  
 return registrationNumber;  
 }  
  
 public void setRegistrationNumber(String registrationNumber) {  
 this.registrationNumber = registrationNumber;  
 }  
  
 public PlaneType getType() {  
 return type;  
 }  
  
 public void setType(PlaneType type) {  
 this.type = type;  
 }  
  
 public Hangar getHangar() {  
 return hangar;  
 }  
  
 public void setHangar(Hangar hangar) {  
 this.hangar = hangar;  
 }  
  
 public ArrayList<Person> getOwners() {  
 return owners;  
 }  
  
 public void setOwners(ArrayList<Person> owners) {  
 this.owners = owners;  
 }  
  
 public Date getAcquisitionDate() {  
 return acquisitionDate;  
 }  
  
 public void setAcquisitionDate(Date acquisitionDate) {  
 this.acquisitionDate = acquisitionDate;  
 }  
  
 public ArrayList<Service> getServicesPerformed() {  
 return servicesPerformed;  
 }  
  
 // Other Methods  
 public void addOwner(Person owner) {  
 owners.add(owner);  
 }  
  
 public void addService(Service service) {  
 servicesPerformed.add(service);  
 }  
}

package ProblemaNor2;  
  
public class PlaneType {  
 private int modelNumber;  
 private int capacity;  
 private double weight;  
  
 // Constructor  
 public PlaneType(int modelNumber, int capacity, double weight) {  
 this.modelNumber = modelNumber;  
 this.capacity = capacity;  
 this.weight = weight;  
 }  
  
 // Getters  
 public int getModelNumber() {  
 return modelNumber;  
 }  
  
 public int getCapacity() {  
 return capacity;  
 }  
  
 public double getWeight() {  
 return weight;  
 }  
  
 // Setters  
 public void setModelNumber(int modelNumber) {  
 this.modelNumber = modelNumber;  
 }  
  
 public void setCapacity(int capacity) {  
 this.capacity = capacity;  
 }  
  
 public void setWeight(double weight) {  
 this.weight = weight;  
 }  
}

package ProblemaNor2;  
  
import java.util.Date;  
  
public class Service {  
 private Date date;  
 private double hoursWorked;  
 private String jobType;  
  
 // Constructor  
 public Service(Date date, double hoursWorked, String jobType) {  
 this.date = date;  
 this.hoursWorked = hoursWorked;  
 this.jobType = jobType;  
 }  
  
 // Getters  
 public Date getDate() {  
 return date;  
 }  
  
 public double getHoursWorked() {  
 return hoursWorked;  
 }  
  
 public String getJobType() {  
 return jobType;  
 }  
  
 // Setters  
 public void setDate(Date date) {  
 this.date = date;  
 }  
  
 public void setHoursWorked(double hoursWorked) {  
 this.hoursWorked = hoursWorked;  
 }  
  
 public void setJobType(String jobType) {  
 this.jobType = jobType;  
 }  
}

1. “Create a main using the previous classes”
2. package ProblemaNor2;  
     
   import java.util.ArrayList;  
   import java.util.Date;  
     
   public class Main {  
    public static void main(String[] args) {  
    // Create a PlaneType  
    PlaneType planeType = new PlaneType(123, 200, 50000.0);  
     
    // Create a Hangar  
     
    // Create some Persons (Owners)  
     
    Person owner2 = new Person("987654321", "Jane Smith", "456 Oak Ave", "555-5678");  
    ArrayList<Person> owners = new ArrayList<>();  
    owners.add(owner1);  
    owners.add(owner2);  
     
    // Create a Plane  
    Plane plane = new Plane("N123AB", planeType, hangar, owners, new Date());  
     
    // Create a Mechanic  
    ArrayList<PlaneType> authorizedPlaneTypes = new ArrayList<>();  
    authorizedPlaneTypes.add(planeType);  
    Mechanic mechanic = new Mechanic(50000.0, "Day Shift", authorizedPlaneTypes);  
     
    // Create a Pilot  
    ArrayList<PlaneType> pilotAuthorizedPlaneTypes = new ArrayList<>();  
    pilotAuthorizedPlaneTypes.add(planeType);  
    Pilot pilot = new Pilot("ABC123", "None", pilotAuthorizedPlaneTypes);  
     
    // Create a Service  
    Service service = new Service(new Date(), 4.5, "Engine Maintenance");  
    plane.addService(service);  
     
    // Print some information  
    System.*out*.println("Plane Registration Number: " + plane.getRegistrationNumber());  
    System.*out*.println("Plane Type Model Number: " + plane.getType().getModelNumber());  
    System.*out*.println("Hangar Number: " + plane.getHangar().getNumber());  
    System.*out*.println("Number of Owners: " + plane.getOwners().size());  
    System.*out*.println("Mechanic Salary: " + mechanic.getSalary());  
    System.*out*.println("Pilot License Number: " + pilot.getLicenseNumber());  
    System.*out*.println("Last Service Date: " + plane.getServicesPerformed().get(0).getDate());  
    }  
   }

* Siguio muy bien las instrucciones del prompt a la hora de crear las clases, lamentablemente cuando fue a crear el main podemos ver que no instancio un hangar aunque había puesto el comentario de donde lo creaba, lo mismo pasa con el objeto “owner1”, intenta usarlo pero nunca lo creo, podríamos realizar una corrección añadiendo esos objetos y el programa tendría el uso que necesitamos.