**Instructions**

* You need to solve **one programming problem** in this challenge.
* The duration of this challenge is **120 Minutes**.
* Programming questions have a **Compile and Run** option where you can run your solution against sample test cases before submitting it.
* Click **Evaluate**button only if your code compiles successfully.
* This challenge covers the following topic(s).
  + Class and Objects
  + Functions
  + ADO.Net

Scenario:

The transport department of your company wants to have an application through which they can add employees commute records to database, display all commute records from database and also display records of all those employees commute that are paying the highest commute fare. Help the transport department by creating the application.

Functionalities:

* Add employee commute records to database
* Display all employee commute records from database
* Display the records of those employees who are paying the highest commute fare.

Data Design:

|  |  |  |
| --- | --- | --- |
| **Tablename: tblOfficeCommuteApp** | |  |
| **Column Name** | **Data type** | **Constraints** |
| Employee\_Id | varchar(100) | Primary Key, Not Null |
| Employee\_Name | varchar(100) | Not Null |
| Employee\_Type | varchar(100) | Not Null |
| Travel\_Distance | float | Not Null |
| Commute\_Charge | float | Not Null |

The database connection information is specified in the “App.config” file, which is also provided as part of code skeleton. **THIS IS GIVEN ONLY FOR YOUR REFERENCE**. You need **NOT** change this. The code skeleton will be available in the Tekstac platform.

Component Specification

* Create a model class called **OfficeCommuteDataInfo** with the below public auto-implemented properties:

|  |  |  |
| --- | --- | --- |
| **Type (Class)** | **Data Types** | **Properties** |
| OfficeCommuteDataInfo | string | EmployeeId |
| string | EmployeeName |
| string | EmployeeType |
| float | TravelDistance |
| float | CommuteCharge |

Also create a default constructor and a parameterized constructor under this class.

* Create a Class called **OfficeCommuteDataOperations** with the below methods:

|  |  |  |
| --- | --- | --- |
| **Type(Class)** | **Methods** | **Responsibilities** |
| OfficeCommuteDataOperations | public bool AddRecords(OfficeCommuteDataInfo commuteData) | This method should accept a **OfficeCommuteDataInfo** object and execute a sql query to insert a employee commute record into the database. It returns true if the insertion is successful and false if it fails to insert. |
| public IList<OfficeCommuteDataInfo> DisplayRecords() | This method will retrieve all commute records from the database. Store each record in OfficeCommuteDataInfo object. Add these objects to a ‘List’. |
| public IList<OfficeCommuteDataInfo> DisplayRecordsByHigestCommuteFare() | This method will retrieve all those employees commute records from the database whose is paying the highest fare. Store each record in OfficeCommuteDataInfo object. Add these objects to a ‘List’. ***[Hint: More than one employee can have the highest fare; so use a sub query for this method].*** |

* Create a class called **Program** with main method. Call the OfficeCommuteDataOperations methods under the Program class and test your application.

**Fare Calculation Formula:**

|  |  |  |
| --- | --- | --- |
| **Employee Type** | **Travel Distance** | **Fare Calculation** |
| INTERNAL | <=10 | commuteFare = travelDistance \* 50 |
| >10 and <=20 | commuteFare = travelDistance \* 60 |
| >20 | commuteFare = travelDistance \* 70 |
| EXTERNAL | <=10 | commuteFare = travelDistance \* 70 |
| >10 and <=20 | commuteFare = travelDistance \* 80 |
| >20 | travelDistance = travelDistance \* 90 |

**Business Rules:**

1. Employee Id should be in the format: The first 3 should be letters (either EXT or INT only) and the next 4 should be numbers (example: EXT1001 is valid, INT001 is valid where as VEN1001 is invalid, ext1001 is invalid, int1001 is invalid). If validation fails return false; else return true

2. Duplicate Employee Id should not be present in the data table. If same Id already exists in table return false; else return true

3. Employee Type should be either INTERNAL or EXTERNAL. If any other value is entered return false; else return true.

4. The Employee Type first 3 letters should be checked if it matches with the first 3 letters of Employee Id. If data matches return true; else return false. [Note: The match checking should be case insensitive].

5. The travel distance should be between 2 km and 30 km. If value is entered outside the specified range return false; else return true.

6. The fare should be rounded to 2 decimal places for display.

7. Enclose all DML and DQL operations in OfficeCommuteDataOperations class under try-catch block.

**Sample Input / Output**

**Welcome Admin to Office Commute System**

**Menu:**

**Enter 1 to Add Employee Commute Records**

**Enter 2 to Display All Employee Commute Records**

**Enter 3 to Display All Employee Commute Records Who Are Paying Highest Fare**

**1**

**Enter Employee Id:**

**int1001**

**Wrong Employee Id Entered..Try Again**

**Enter Employee Id:**

**INT1001**

**Enter Employee Name:**

**Sam**

**Enter Employee Type(External or Internal):**

**vendor**

**Invalid Employee Type..Try Again**

**Enter Employee Type(External or Internal):**

**EXTERNAL**

**Employee Type does not match with Employee Id type..Try Again**

**Enter Employee Type(External or Internal):**

**INTERNAL**

**Enter Travel Distance:**

**100**

**Invalid Travel Distance..Try Again**

**Enter Travel Distance:**

**1**

**Invalid Travel Distance..Try Again**

**Enter Travel Distance:**

**9**

**Data Insertion Successful**

**Press yes to continue your work..Any other key to terminate operation**

**yes**

**Menu:**

**Enter 1 to Add Employee Commute Records**

**Enter 2 to Display All Employee Commute Records**

**Enter 3 to Display All Employee Commute Records Who Are Paying Highest Fare**

**1**

**Enter Employee Id:**

**INT1001**

**Same Employee Id already present in database..Try With another ID**

**Enter Employee Id:**

**INT1002**

**Enter Employee Name:**

**Joe**

**Enter Employee Type(External or Internal):**

**INTERNAL**

**Enter Travel Distance:**

**15**

**ta Insertion Successful**

**Press yes to continue your work..Any other key to terminate operation**

**yes**

**Menu:**

**Enter 1 to Add Employee Commute Records**

**Enter 2 to Display All Employee Commute Records**

**Enter 3 to Display All Employee Commute Records Who Are Paying Highest Fare**

**2**

**Display All Employees Commute Information:**

**Employee Id Name Employee Type Distance Commute Fare**

**INT1001 Sam INTERNAL 9 450.00**

**INT1002 Joe INTERNAL 15 900.00**

**Press yes to continue your work..Any other key to terminate operation**

**yes**

**Menu:**

**Enter 1 to Add Employee Commute Records**

**Enter 2 to Display All Employee Commute Records**

**Enter 3 to Display All Employee Commute Records Who Are Paying Highest Fare**

**3**

**Display Employees With Highest Commute Fare:**

**Employee Id Name Employee Type Distance Commute Fare**

**INT1002 Joe INTERNAL 15 900.00**

**Press yes to continue your work..Any other key to terminate operation**

**N**

**Thank you for using the app. Have a nice day:**