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COMP 5160

ALDOT Database: Geotechnical Info.

ER Model Schema

**Classes:**

* Project
* Experiment
* Person
* Mission
* Vehicle
* Equipment
* Borehole
* Soil Layer
* Zip Code Region
* Bank
* Account

**Subclasses:**

* Employee (from Person)
* Civil Engineer (from Employee)
* Field Operator (from Employee)
* Computer Science (from Employee)

**Attributes:**

* Project:
  + project\_id (Primary Key)
  + title
  + start\_date
  + end\_date
  + creation\_date
* Experiments:
  + experiment\_id (Primary Key)
  + title
  + start\_date
  + end\_date
  + organization\_name
  + organization\_address (street, city, state, zip)
* Person:
  + ssn (Primary Key)
  + last\_name
  + middle\_name
  + first\_name
  + address (street, city, state, zip)
  + phone
  + join\_date
  + email
* Mission:
  + mission\_id (Primary Key)
  + title
  + start\_date
  + end\_date
  + num\_employees
* Vehicle:
  + vin (Primary Key)
  + price
  + administrator
* Equipment:
  + equipment\_id (Primary Key)
  + name
  + description
* Borehole:
  + borehole\_id (Primary Key)
  + depth
  + location
  + drill\_state
  + testing\_type
* Soil Layer:
  + layer\_id (Primary Key)
  + start\_depth
  + end\_depth
  + soil\_type
* Zip Code Region:
  + zip\_code (Primary Key)
  + polygon\_area
* Bank:
  + routing\_number (Primary Key)
  + name
  + address (street, city, state, zip)
  + phone
* Account:
  + account\_number (Primary Key)
  + balance
  + owner

**Relationships:**

* Project -> Experiment (one-to-many, strong):
  + A project contains several experiments; an experiment belongs to one project.
* Experiment -> Zip Code Region (many-to-many, strong):
  + An experiment can be conducted in multiple zip code regions; a zip code region can be associated with multiple experiments.
* Experiment -> Mission (one-to-many, strong):
  + An experiment contains several missions; a mission belongs to one experiment.
* Mission-Employee (many-to-many, strong):
  + A mission can involve multiple employees; an employee can work on multiple missions.
* Employee-Person (one-to-one, strong):
  + An employee is a person; a person can be an employee.
* Person-Civil Engineer (one-to-one, weak):
  + A person can have a civil engineering expertise; a civil engineer is a person.
* Person-Field Operator (one-to-one, weak):
  + A person can have a field operation experience; a field operator is a person.
* Person-Computer Specialist (one-to-one, weak):
  + A person can have computer skills; a computer specialist is a person.
* Mission-Vehicle (many-to-many, strong):
  + A mission can use multiple vehicles; a vehicle can be used in multiple missions.
* Mission-Equipment (many-to-many, strong):
  + A mission can use multiple equipment; an equipment can be used in multiple missions.
* Mission-Borehole (one-to-many, strong):
  + A mission drills multiple boreholes; a borehole is drilled in one mission.
* Borehole-Soil Layer (one-to-many, strong):
  + A borehole contains multiple soil layers; a soil layer belongs to one borehole.
* Project-Account (one-to-many, strong):
  + A project has an account in a bank; an account belongs to one project.
* Bank-Account (one-to-many, strong):
  + A bank has multiple accounts; an account belongs to one bank.