CECS 323 Final Project Part 1

I. **Business Rule**

- A current customer referral benefits will be applied to his or her account continuously until those benefits run out.
- An employee can either be a technician or a mechanics but not both.
- Technician must have knowledge of all services provided at Dave's Automotive.
- Technician only need to write services which are not part of vehicle routine services.
- A mastery level must be an integer between 1 to 10 inclusive where 1 is the minimum mastery level and 10 is the maximum mastery level of the mechanic's skill.

II. **Class Definition in English**

- **Customer**: people who require or have a possible of requiring service at Dave's Automotive.
- **Current**: customers who come to Dave's Automotive for vehicle service.
- **Prospective**: customers who have potential of requiring vehicle service from Dave's Automotive.
- **PromotionContact**: information associated with date, time, and mode of communication in which Dave's Automotive attempt to entice a prospective customer into a current customer.
- **Premier**: current customers who pay monthly (buy insurance) for service from Dave's Automotive.
- **Steady**: current customers who pay per visit for service from Dave's Automotive.
- **Address**: location or locations in which current customers associate with.
- **PriceIncrease**: the amount and cause of an increase in monthly payment of premier customers.
- **Vehicle**: a machine who purpose to carry people around from place to place at high speed.
- **VehicleFamily**: contains general information about a vehicle.
- **MaintainOrder**: services that require to be perform on a specific vehicle.
- **Employee**: people who work at Dave's Automotive.
- **Technician**: employees of Dave's Automotive who purpose is to diagnose and write extra services required by a vehicle.
- **Mechanics**: employees of Dave's Automotive who purpose are to do maintain or repair of a vehicle.
- **MaintainPackage**: a collection of service.
- **MaintainPackageLine**: shows relationship between MaintainPackage and MaintainOrder.
- **Skillset**: abilities of mechanics to do a specific job.
- **SkillsetLine**: keep track of mystery level of a specific skill for a specific customer.
- **MaintainItem**: a specific service that has been assigned to a specific mechanic.

- **TraniningSkill**: show a history of training relationship between mechanics.
- **ZipLocation**: a place in United States where postal service has assigned a specific identification code.
- **JobQueLine:** show a relationship between maintain item and mechanics and it keeps track of date in which a mechanic work on a specific item.
- **ItemWork:** shows relationship between MaintainOrder and MaintainItem.
- **ReferralBenefitHistory:** Keep tracks of referral benefits of a current customer.
- **Appointment:** tracks an appointment of a vehicle
- **AppointmentStatus:** shows the available status for each appointment.
- **CommunicationType:** shows the available communication type for each promotion contact.
- **MasteryLevel:** shows the available mastery level for each skillsetline.

III. **Association:**

- **Customers:**
  - A customer is a current customer, a perspective customer, or others but he or she can only be one.
  - A perspective customer is a customer.
  - A current customer is a customer.
- **Prospective:**
  - A perspective customer received one to three promotion contact.
  - A promotion contact was received by one and only one perspective customer.
- **Current**:
  - A current customer related to one to many address.
  - An address is related to one and only one current customer.
  - A current customer is either a premier customer or a steady customer but not both.
  - A premier customer is a current customer.
  - A steady customer is a current customer.
  - A current customer owned one to many vehicles.
  - A vehicle is owned by one and only one current customer.
  - A current customer has zero to many referral benefit histories.
  - A referral benefit history is belonged to one and only one current customer.
- **Premier:**
  - A premier customer associate with zero to many price increases.
  - A price increase is associated with one and only one premier customer.
- **Vehicle:**
  - A vehicle is part of one and only one vehicle family.
  - A vehicle family is made up of zero to many vehicles.

- o   A vehicle requires one to many maintain orders.
- o   A maintain order is required by one and only one vehicle.
- o   A vehicle has zero to many appointments.
- o   An appointment is belonged to one and only one vehicles

- **Maintain Order:**
  - o   A maintain order link to zero to many maintain package lines. (1)
  - o   A maintain package line linked to one and only one maintain order. (1)
  - o   A maintain order contains one to many item works. (2)
  - o   An item work contains within one and only one maintain order. (2)

- **Maintain Package:**
  - o   A maintain package link to zero to many maintain package lines. (1)
  - o   A maintain package line linked to one and only one maintain order. (1)
  - o   A maintain package composed of one to many maintain item.
  - o   A maintain item is composed within one and only one maintain package.

- **Employee:**
  - o   An employee is a technician, a mechanics, or others but he or she can only be one.
  - o   A technician is an employee.
  - o   A mechanics is an employee.

- **Technician:**
  - o   A technician writes one to many maintain orders.
  - o   A maintain order was written by one and only one technician.

- **Mechanic:**
  - o   A mechanic trained zero to many other mechanic.
  - o   A mechanic is trained by one and only one other mechanic.
  - o   A mechanic is associated with one to many skillset lines. (4)
  - o   A skillset line is associated with one and only one mechanic. (4)
  - o   A mechanic is responsible for zero to many job que line. (3)
  - o   A job que line is responsible by one and only one mechanic. (3)

- **Skillset:**
  - o   A skillset is associated with one to many skillset line. (4)
  - o   A skillset line is associated with one and only one skillset. (4)

- **Maintain Item:**
  - o   A maintain item is contain within zero to many job que line. (3)
  - o   A job que line contains one and only one maintain item. (3)
  - o   A maintain item contain within one to many item work. (2)
  - o   An item work contains one and only one maintain item. (2)

- **AppointmentStatus:**
  - o   An appointment status is associated with one to many appointments.
  - o   An appointment is associated with one and only one appointment status.

- **CommunicationType**
  - A communication type is associated with one to many promotion contacts.
  - A promotion contact is associated with one and only one communication type.
- **MasteryLevel**
  - A mastery level is associated with zero to many skillsetlines.
  - A skillsetline is associated with one and only one mastery level.

IV. **Normalization:**
- All classes are in third normalization form because we eliminated multivalve and repeated values. In addition, we also able to eliminate sub key through the use of lossless join decomposition especially for class **Address** and **Vehicle**.

V. **Attribute Definition:**
  a. **Customer**:
      i. firstName: customer first name.
      ii. lastName: customer last name.
      iii. dateOfBirth: customer date of birth.
      iv. phoneNumber: customer phone number.
      v. email: customer email.
  b. **Current**:
      i. JoinedDate: date in which a current customer became a member.
  c. **Prospective**:
      i. ReferralName: name of a customer who refers this prospective customer.
      ii. DeadFlag: shows if Dave's automobile should try to contact them again for promotional purpose.
  d. **PromotionContact**:
      i. Date: date of contact attempt.
      ii. Time: time of contact attempt.
  e. **Premier**:
      i. AnnualFee: yearly membership fee.
      ii. DueDate: the next due date for monthly membership fee.
      iii. OriginalPrice: original membership fee before price increase.
  f. **Steady**:
      i. LoyaltyPoint: loyalty point of a steady customer.
  g. **Address**:
      i. Type: address type.
      ii. Address: street address.
  h. **PriceIncrease**:
      i. PercentIncreased: the percent of price increase to membership fee of premier customers.

       ii.   Reason: reason for price increase.
- i. **Vehicle**:
    - i. Vin: vehicle identification number.
    - ii. Mileage: vehicle current mileage.
    - iii. ExpectedMileageThisYear: mileage expect to put on vehicle this year.
    - iv. MaintainInterval: the maintain mileage interval
    - v. RoutineService: mandatory service packages that performed on vehicle every visit.
- j. **VehicleFamily**:
    - i. Model: model of a vehicle.
    - ii. Year: year of a vehicle.
    - iii. Maker: manufacturer of a vehicle.
- k. **MaintainOrder**:
- l. **Employee:**
    - i. Name: name of employee.
    - ii. Salary: hour rate paid.
    - iii. HiredDate: hired date.
- m. **Technician**:
- n. **Mechanics**:
- o. **MaintainPackage**:
    - i. Name: name of maintain package.
    - ii. Description: description of maintain package.
- p. **MaintainPackageLine**:
- q. **Skillset**:
    - i. Name: name of skill set.
    - ii. Description: description of skill set.
- r. **SkillsetLine**:
- s. **MaintainItem**:
    - i. Name: name of maintain item.
    - ii. Skill: skill name required to do the maintain item.
    - iii. Cost: price we charged customer for performing the maintain item.
    - iv. BuyInPrice: cost of performing the maintain item.
- t. **TraniningSkill**:
    - i. StartDate: start of mentoring relationship.
    - ii. EndDate: end of mentoring relationship.
    - iii. SkillTrained: skillset trained during the mentoring relationship.
- u. **ZipLocation**:
    - i. Zipcode: zip code of a zip location.
    - ii. City: city of that zip location.
    - iii. State: state of that zip location.
- v. **JobQueLine:**

       i. DateOfWork: date in which a mechanic assigned to that maintain item.

w. **ItemWork:**
       i. Date: date in which the relationship between MaintainOrder and MaintainItem was established.

x. **ReferralBenefitHistory:**
       i. Benefit: benefit received
      ii. Date: date that benefit was granted.
     iii. Flag: if benefit already applied to account or not.

y. **Appointment:**
       i. Date: date of the appointment.
      ii. Time: time of the appointment.
     iii. ExpectedTime: expected time taken for that appointment.

z. **AppointmentStatus:**
       i. Status: the status of an appointment.

aa. **CommunicationType:**
       i. Type: type of communication.

bb. **MasteryLevel:** shows the available mastery level for each skillsetline.
       i. MasteryLevel: level available to a skillset.