**PROJECT PHASE – 3**

**a.Normalize all of your tables to third normal form.**

**BCNF DEFINITION:** A relation schema R is in BCNF if for every FD X→ Y associated with R either – Y ⊆ X (i.e., the FD is trivial) or

– X is a superkey of R

**PERSON**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pid** | FirstName | LastName | MiddleName | Address | Gender | Phone Number |

**FD1-** Pid FirstName, LastName, MiddleName, Address, Gender, Phone Number.

**EMPLOYEE**

|  |  |
| --- | --- |
| **EPid** | StartDate |

**FD2-** EPid StartDate

**ACLASSPASSENGER**

|  |
| --- |
| **Apid** |

**FD3-** Apid Apid

**ASTARPASSENGER**

|  |  |
| --- | --- |
| **ASEpid** | **ASApid** |

**FD4-** ASEpid ,ASApid ASEpid, ASApid

**CHILDREN**

|  |  |  |
| --- | --- | --- |
| **CApid** | **CName** | CAge |

**FD5-** CApid ,CName CAge

**GUEST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **GASEpid** | **GASAPid** | **GuestId** | GName | ContactInfo |

**FD6-** GASEpid ,GASAPid, GuestId GName, ContactInfo

**BUSDRIVER**

|  |
| --- |
| **BEPid** |

**FD7-** BEPid BEPid

**STAFF**

|  |
| --- |
| **SEPid** |

**FD8-** SEPid SEPid

**BUS**

|  |  |  |
| --- | --- | --- |
| BusNo | No\_Seats | **LicenseNo** |

**FD9-** LicenseNo BusNo , No\_Seats

**TERMINAL**

|  |  |  |  |
| --- | --- | --- | --- |
| **TerminalId** | Loc | Date | Time |

**FD10-** TerminalId Loc, Date, Time

**DRIVES**

|  |  |  |  |
| --- | --- | --- | --- |
| **DBEPid** | Date | Hours | **DLicenseNo** |

**FD11-** DBEPid ,DLicenseNo Date, Hours

**PARKED**

|  |  |
| --- | --- |
| **PTerminalId** | **PLicenseNo** |

**FD12-** PTerminalId, PLicenseNo PTerminalId, PLicenseNo

**TICKET**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TPid | **TicketId** | BusId | SeatNo | Price | TSEPid |

**FD13-** Ticketid TPid, BusId, SeatNo, Price, TSEPid

**DARTPASS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DPassID** | Expiry | Price | DPSEPid | DPPid |

**FD14-** DPassID Expiry, Price, DPSEPid, DPPid

**PAYMENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **PayId** | Method | StaffId | PPid |

**FD14-** PayId Method, StaffId, PPid

**TRAVELCARD**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TravelCardID** | Expiry | Price | StaffId | TCASAPid | TCASEPid |

**FD15-** TravelCardID Expiry, Price, StaffId, TCASAPid, TCASEPid

**PROMOTIONS**

|  |  |  |
| --- | --- | --- |
| **PDPassID** | **PromotionId** | PromotionName |

**FD16-** PDPassID ,PromotionId PromotionName

**ROUTE**

|  |  |
| --- | --- |
| **Rid** | RouteName |

**FD17-** Rid RouteName

**BUSSTOP**

|  |  |
| --- | --- |
| **BsId** | BsName |

**FD18-** BsId BsName

**TIMETABLE**

|  |  |  |  |
| --- | --- | --- | --- |
| **TTId** | Day | StTime | endTime |

**FD18-** TTId Day, StTime, endTime

**OVERALLBUSINFO**

|  |  |  |  |
| --- | --- | --- | --- |
| **ORid** | **OBsId** | OLicenseNo | **OTTId** |

**FD19-** ORid , OBsId, OTTId OLicenseNo

FD1,FD2,FD3,FD3,FD4,FD4,FD5,FD6,FD7,FD8,FD9,FD10,FD11,FD12,FD13,FD14,FD15,FD16,FD17,FD18,FD19 are satisfying BCNF conditions. So all relations are in BCNF Form. This implies our Design satisfies both BCNF and 3NF also which satisfies our project requirement.

**b.Draw a dependency diagram for each table from Phase III a.**

**PERSON**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pid** | FirstName | LastName | MiddleName | Address | Gender | Phone Number |

**EMPLOYEE**

|  |  |
| --- | --- |
| **EPid** | StartDate |

**ACLASSPASSENGER**

|  |
| --- |
| **Apid** |

**ASTARPASSENGER**

|  |  |
| --- | --- |
| **ASEpid** | **ASApid** |

**CHILDREN**

|  |  |  |
| --- | --- | --- |
| **CApid** | **CName** | CAge |

**GUEST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **GASEpid** | **GASAPid** | **GuestId** | GName | ContactInfo |

**BUSDRIVER**

|  |
| --- |
| **BEPid** |

**STAFF**

|  |
| --- |
| **SEPid** |

**BUS**

|  |  |  |
| --- | --- | --- |
| **LicenseNo** | No\_Seats | BusNo |

**TERMINAL**

|  |  |  |  |
| --- | --- | --- | --- |
| **TerminalId** | **Loc** | **Date** | **Time** |

**DRIVES**

|  |  |  |  |
| --- | --- | --- | --- |
| **DBEPid** | **DLicenseNo** | **Hours** | **Date** |

**PARKED**

|  |  |
| --- | --- |
| **PTerminalId** | **PLicenseNo** |

**TICKET**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TicketId** | **TPid** | **BusId** | **SeatNo** | **Price** | **TSEPid** |

**DARTPASS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DPassID** | Expiry | Price | DPSEPid | DPPid |

**PAYMENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **PayId** | Method | StaffId | PPid |

**TRAVELCARD**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TravelCardID** | Expiry | Price | StaffId | TCASAPid | TCASEPid |

**PROMOTIONS**

|  |  |  |
| --- | --- | --- |
| **PDPassID** | **PromotionId** | PromotionName |

**ROUTE**

|  |  |
| --- | --- |
| **Rid** | **RouteName** |

**BUSSTOP**

|  |  |
| --- | --- |
| **BsId** | BsName |

**TIMETABLE**

|  |  |  |  |
| --- | --- | --- | --- |
| **TTId** | Day | StTime | endTime |

**OVERALLBUSINFO**

|  |  |  |  |
| --- | --- | --- | --- |
| **ORid** | **OBsId** | **OTTId** | OLicenseNo |

**Write SQL statements to create database, tables and all other structures. Primary key and foreign keys must be defined as appropriate**