Name: Zhe Lin

001422116

1. Businf := π­­­­busID, age, manufacturer­(σadvertisingRevenue>=9000(Bus))
2. R := π­­­­SIN­(σDateOfBirth>’1/1/1993’ ∨ Occupation=’student’(Person))

Number\_Student := γcount(\*)→NumberOfStudents(σPerson.SIN=R.SIN(Person⨝R))

1. R := π­­­­SIN­(σOccupation=’student’(Person))

Result := γcount(\*)(σTake.SIN=R.SIN (σBus.RouteID = 5∧take.date=’5/3/2017’ (Take ⨝ Bus) ⨝ R))

1. Result := τSUM(AdvertisingRevenue) DESC (γRouteID, SUM(AdvertisingRevenue)→AdRevenue(Bus))

5(a). R := πSIN (σCOUNT(date)<3(γSIN,COUNT(date)(Infraction)))

Result := π­­­­Person.SIN, Person.FirstName, Person.LastName­(σPerson.SIN=R.SIN (Person⨝R))

5(b). R := τ SUM(Infraction.Demerit) DESC (πInfraction.SIN,SUM(Infraction.Demerit)→TotalDemerit,SUM(Infraction.Fine)→TotalFine­­­­(σSUM(Infraction.Demerit)>=2(γInfraction.SIN, SUM(Infraction.Demerit),SUM(Infraction.fine)(σInfraction.SIN=Driver.SIN (Infraction⨝Driver)))))

1. R := πBus.Manufacturer(σCOUNT(Bus.BusID<2(γManufacturer, COUNT(BusID)(Bus)))

Result := π­­­­Bus.BusID, Bus.Manufacturer (σBus.Manufacturer=R.Manufacturer (Bus⨝R))

7(a). Result := γPassenger.type, SUM(Fare.fee)→TotalRevenue(σTake.SIN=Passenger.SIN(σPassenger.Type=Fare.Type(Passenger⨝ Fare) ⨝Take)))

7(b). Result := πPassenger.type(σSUM(Fare.fee)>500(γPassenger.type, SUM(Fare.fee)→TotalRevenue(σTake.SIN=Passenger.SIN(σPassenger.Type=Fare.Type(Passenger⨝ Fare) ⨝Take))))

7(c). Result := πPassenger.type(σrownum()=1(τ SUM(Fare.fee) DESC(γPassenger.type, SUM(Fare.fee)→TotalRevenue(σTake.SIN=Passenger.SIN∧Take.Date=’5/1/2017’(σPassenger.Type=Fare.Type(Passenger⨝ Fare) ⨝Take)))))

8(a) R1 := γCOUNT(\*)((σTake.Date=’5/7/2017’(Bus⨝Take) ⨝Route))

MAX := γMAX(num) (R1)

Result := πRoute.RouteID,COUNT(\*)→NumberOfPassenger(σCOUNT(\*)=MAX(γCOUNT(\*)(σTake.Date=’5/7/2017’(Bus⨝Take) ⨝Route)))

8(b) R1 := γCOUNT(\*), Take.date(Take)

MAX := γMAX (R1)

Result := π­­­­Take.Date, COUNT(Take.SIN)→NumberOfTrips(σCOUNT(Take.SIN)=MAX(γTake.Date, COUNT(Take.SIN) (Take))

9. Result := π­­­­Person.Occupation(σTake.Date=’5/5/2017’((σSite.SIName=’Library’∨Take.Date=’5/6/2017’(Site⨝Go) ⨝Bus)⨝Take)⨝Person)

10. R := π­­­­Infraction.SIN,SUM(Infraction.Demerit)( σSUM(Infraction.Demerit)<10(γInfraction.SIN, SUM(Infraction.Demerit) (Infraction)))

Result := π­­­­Person.FirstName, Person.LastName, Person.SIN→ID (σDriver.YearsOfService>5 ∧ Driver.Salary>80000(Driver⨝Person)⨝R)

11. Result := π­­­­Person.FirstName, Person.LastName, Person.Sex (σPerson.Occupation=’student’(σEvent.EName=’Marauders Tennis’(σBus.RouteID=4(Take⨝Bus)⨝Go)⨝Event) ⨝Person)

12. R := πGo.­­­­RouteID (σEvent.EName=’Marauders Basketball’(Go ⨝Event))

Result := πSchedule.RouteID, Stop.SName, Schedule.ArrivalTime­­­­(σSchedule.ArrivalTime>=’16:20:00’ AND Schedule.ArrivalTime <= ’16:50:00’ AND Schedule.Date=’5/1/2017’((Schedule⨝R)⨝ Stop))