

Comp 421 – Assignment 1

Exercise 1

1. Attached pdf Ass1Q1.1

2.

- User(id, credit_card_number, type)
- Member(user_id, name, address, email, login_name, password, key_number, entry_date, trip_number, kilometer)
- Casual(user_id, tmp, key)
- Billing_statement(id, total)
- Bike(id, year_built, repair_flag)
- Trip(id, time_start, time_returned)
- Station(location)
- Bike_dock(id, number, need_repair, locked)

Relationship

- Statement_trip(billing_statement_id, trip_id, price)
- Bike_used(trip_id, bike_id)
- Has_one_bike(bike_dock_id, bike_id)
- Belongs_to_station(bike_dock_id, station_id)
- Station_start(trip_id, station_id)
- Station_returned(trip_id, station_id)
- Current_trip(user_id, trip_id)
- Belongs_to_member(billing_statement_id, user_id)

Exercise 2

1. Attached pdf Ass1Q2.1

2.



We have a one to many relationship, A as one B and B can have multiple A's

Exercise 3

1. $\pi_{pid}(\sigma_{dep_{id}=D2 \wedge start_{date}=2014}(Project))$
2. $\pi_{Project.pid}(\sigma_{Evaluation.grade='excellent'}(Project \bowtie Evaluation))$
3. $\pi_{Employee.ename}(\sigma_{Departement.dep_{id}=D2t'}(Departement \bowtie_{Employee.eid=Departement.manager} Employee))$
4. $\pi_{Employee.eid}(\sigma_{Evaluation.pid=P1'}(Employee \bowtie Evaluation) \cap \sigma_{Evaluation.pid=P2'}(Employee \bowtie Evaluation))$
5. $\pi_{Evaluation.pid}(Evaluation \bowtie_{Evaluation.e_{id}=Departement.manager} Departement)$

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6. $\pi_{Evaluation.pid} \left(\sigma_{Departement.dep_id=Project.dep_id} (Project \bowtie Evaluation \bowtie_{Evaluation.e_id=Departement.manager} Departement) \right)$
7. $\pi_{Project.pid, Project.start_year} (\sigma_{Evaluation.grade='excellent'} (Project \bowtie Evaluation) - \sigma_{Evaluation.grade \neq 'excellent'} (Project \bowtie Evaluation))$
8. $\pi_{Evaluation.pid} \left(\sigma_{E1.pid \neq E2.pid \wedge E1.date \neq E2.date \wedge E1.pid = E2.pid} (\rho(E1, Evaluation) \times \rho(E2, Evaluation)) \right)$