DBS Hw 1

Question 1

Question a

```
T1 = project_{classcode, instructorname, email} (select_{instructorname = 'Fogg'} (Teaches))
T2 = select_{examdate > '11-01-2020'} (Exams)
Result = project_{classname, examname, examdate} (T1 * T2 * Classes)
```

Question b

```
Result = project_{classcode, dayofweek, starttime} (Classmeetings)) * (project_{classcode, dayofweek, starttime} (Officehours)
```

Question c

```
Result = project_{classcode, classname} ((select_{dayofweek='Monday'} (Classmeetings)) * Classes)
```

Question d

```
T1 = project_{classcode} (select_{semester = 'Fall', year = '2000'} (Classes))
T2 = project_{sitename} ((select_{resourcetype = 'hw'} (Resources)) * T1)
Result = project_{username, bestbrowser} (Sites * T2)
```

Question e

```
Result = (project_{sitename} (Classmeetings)) union (project_{sitename} (Exams)) union (project_{sitename} (Officehours)) union (project_{sitename} (Resources))
```

Question f

```

```

Question g

```
T1 = Classes * Teaches
```

Question h

```
T1 = (select_{dayofweek <> 'Monday' and dayofweek <> 'Wednesday'} (Officehours))
T2 = project_{classcode} (select_{semester = 'Fall', year = '2000'} (Clesses))
T3 = project_{classcode, starttime, duration} (T1 * T2)
ResultCourseCode = project_{}
```

Question 2

Question 1

Keys

```
ABC
```

BCNF

Not satisfied, because

- AC -> DE is not trival and AC is not a superkey
- BD -> F is not trival and BD is not a superkey

3NF

Not satisfied, because

- AC -> DE is not trival, AC is not a superkey, and DE are not prime attributes
- BD -> F is not trival, BD is not a superkey, and F is not prime attribute

Question 2

keys

```
ABC, BCD
```

BCNF

Satisfied, because

- ABC -> DEF is not trival and ABC is a superkey
- AB -> A is trival
- BCD -> AEF is not trival and BCD is a superkey

3NF

Satisfied, because BCNF is satisfied

Question 3

keys

```
BC
```

BCNF

Satisfied, because

- ABC -> DE is not trival and ABC is a superkey
- BC -> AF is not trival and BC is a superkey

3NF

Satisfied, because BCNF is satisfied

Question 4

keys

```
ABC, BDC
```

BCNF

Satisfied, because

- ABC -> DEF is not trival and ABC is a superkey
- BD -> A is not trival and BD is a superkey

3NF

Satisfied, because BCNF is satisfied