Steven Fan
861230571

Lab 4

1)
$\pi_{Year,\ Title}(BOOKS)$

2)
$\sigma_{Major = \text{“CS”}}(STUDENTS)$

3)
$\pi_{StName,\ Title}(STUDENTS \times borrows)$

4)
Assuming list book titles
$\pi_{Title}(\sigma_{Publisher = \text{“McGraw-Hill”}\ AND\ Year < 1990}(BOOKS))$

5)
$\pi_{AName}(\sigma_{Address = \text{“Davis”}}(AUTHORS))$

6)
$\pi_{StName}(STUDENTS) - \pi_{StName}(\sigma_{Age <= 30\ OR\ Major = \text{“CS”}}(STUDENTS))$

7)
$\rho_{AUTHORS(Name,\ Address)}(AUTHORS)$

8)
$\pi_{StName}(borrows \bowtie \sigma_{Major = \text{“CS”}}(STUDENTS))$

9)
$\pi_{Title}(\sigma_{AName = \text{“Jones”}}(has\text{-}written) \bowtie BOOKS)$

10)
$\pi_{Title}(BOOKS \bowtie (\sigma_{AName = \text{“Jones”}}(has\text{-}written) \bowtie (describes - \sigma_{Keyword = \text{“database”}}(describes))))$

11)
$\pi_{StName}(\pi_{Age}(STUDENTS) - \pi_{STUDENTS.Age}(\sigma_{STUDENTS.Age > list.Age}(STUDENTS \times \rho_{list}(STUDENTS))))$

12)
$\pi_{Title}(\pi_{Year}(BOOKS) - \pi_{BOOKS.Year}(\sigma_{Title.Year > list.Year}(BOOKS \times \rho_{list}(BOOKS))))$