CS465 Databases and Scripting Languages
Midterm Solutions
Fall 201

1. a
2. c
3. c
4. b
5. b
6. d
7. e
8. b
9. c
10. b
11. c
12. d
13. a
14. a
15. a, b, c, d
16. e, f
17. a, d, g, h, k
18. b
19. a, d, e, f
20. b, c
21. d
22. d, f, d, a
23. a, c, d, i, l
24. a, b, f, g, h, i, j

25. **Queries (8 points):** Write the following queries in the requested language:

a. SQL: List the titles of all books that are published by 'Wiley and Sons' and whose genre is either 'mystery' or 'adventure'.

SELECT title FROM Catalog
    WHERE publisher = 'Wiley and Sons'
        AND genre IN ('mystery', 'adventure');

b. SQL: List the books on hold for member 'Candice Gray (firstname 'Candice, lastname 'Gray'). The information you should print should be the book title, the dateRequested, and the name of the branch where the book will be picked up. **You must write the answer using joins, not subqueries.**

SELECT c.title, h.dateRequested, b.branchName
    FROM Hold h NATURAL JOIN Catalog c NATURAL JOIN Member m
    NATURAL JOIN Branch b
    WHERE m.firstname = 'Candice' AND m.lastname = 'Gray';

    Or

SELECT c.title, h.dateRequested, h.branchNo
    FROM Hold h, Catalog c, Member m, Branch b
    WHERE m.firstname = 'Candice' AND m.lastname = 'Gray'
        AND m.memberNo = h.memberNo
        AND h.catalogNo = c.catalogNo
        AND b.branchNo = h.branchNo

c. Relational Algebra: List the bookNo and loanStatus of all copies of the book "Paradise Lost".

$$\Pi_{\text{Book.bookNo, Book.loanStatus}}\text{Catalog}(\sigma_{\text{title='Paradise Lost}}$$
$$\bowtie_{\text{Catalog.catalogNo=Book.catalogNo}}\text{Book})$$

Note that the join predicate, Catalog.catalogNo = Book.catalogNo, is not needed because the join is a natural join.

d. Relational Calculus: List the first and last names of the members who visited the Farragut branch on 2015-03-06.

$\{M.firstname, M.lastname \,|\, Member(M) \wedge (\exists V)(\exists B)((Visit(V) \wedge Branch(B) \wedge B.branchName =' Farragut' \wedge B.branchNo = V.branchNo \wedge M.memberNo = V.memberNo \wedge V.dateVisited =' 2015-03-06')\}$

26. B+ Tree solution