CS 775/875 Quiz 2 2/17/2021 Name _____

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Department                Project
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DNAME | DNO |             |PNAME    |  YEAR  | DNO  |
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EE    | 100 |             |robotics |  2012  | 102  |
MATH  | 101 |             |database |  2000  | 100  |
CS    | 102 |             |health   |  2000  | 102  |
ME    | 106 |             ---------------------------
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DNAME and PNAME are of the same type.
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1. (2.5) Which of the following expressions computes the query: (check one correct answer)
   List the DNAME of department with projects started after 2000.

   (a) $\pi_{DNAME}\sigma_{DNO=dnumber}(Department \times \rho_{Dept(dnumber)}\sigma_{YEAR>2000}(Project))$
   (b) $\pi_{DNAME}\sigma_{DNO=dnumber \wedge YEAR>2000}(Department \times \rho_{Dept(dnumber)}\pi_{DNO}(Project))$
   (c) $\pi_{DNAME}\sigma_{DNO=dnumber}(Department \times \rho_{Dept(dnumber)}\pi_{DNO}\sigma_{YEAR>2000}(Project))$
   (d) $\pi_{DNAME}\sigma_{DNO=dnumber}(\pi_{DNAME}(Department) \times \rho_{Dept(dnumber)}\sigma_{YEAR>2000}(Project))$

2. Consider the following RA query: $Department \times \pi_{YEAR}(Project)$

   (a) (1.25) the number of tuples in the output is _____.

   (b) (1.25) the number of columns in the output is _____.

3. (2.5) What is the output of the following command?
   $\pi_{DNAME}\sigma_{DNO>101}(Department) \cup \rho_{Project2(DNAME)}\pi_{PNAME}(Project)$

4. (2.5) What is the output of the following command?
   $\pi_{DNO}\sigma_{DNO=dno2 \wedge PNAME \neq pname2}(Project \times \rho_{Project2(pname2,YEAR2,dno2)}Project)$