CSC343 Worksheet 3 Solution

June 15, 2020

1. **Exercise 6.1.1**:

   If there is a comma between A and B (i.e, *SELECT A, B*), we can conclude A and B are two different attributes.

   If there are no commas between A and B, we can conclude B is an alias of A.

2. **Exercise 6.1.2**:

   a) SELECT address FROM Studio WHERE name = 'MGM';

   b) SELECT birthdate FROM MovieStar WHERE name = 'Sandra Bullock';

   c) SELECT starName FROM StarsIn WHERE movieYear = 1980, movieTitle LIKE '%Love%';

   Correct Solution:

   SELECT starName FROM StarsIn WHERE movieYear = 1980 AND movieTitle LIKE '%Love%';

   d) SELECT name FROM MovieExec WHERE netWorth >= 10000000;

   e) SELECT name FROM MovieStar WHERE gender='male' OR address LIKE '%Malibu%';

3. **Exercise 6.1.3**:

   a) SELECT model, speed, hd FROM PC WHERE price < 1000;

   b) SELECT model, speed AS gigahertz, hd AS gigabytes FROM PC WHERE price < 1000;

   c) SELECT maker FROM Product WHERE type='printer';

   d) SELECT model, ram, screen FROM Laptops WHERE price > 1500;

   e) SELECT * FROM Printer WHERE color=TRUE;

f) SELECT model, hd FROM PC WHERE speed = 3.20 AND price < 2000;

4. **Exercise 6.1.4**:

a) SELECT class, country FROM Classes where numGuns >= 10;

b) SELECT name AS shipName FROM Ships WHERE launched < 1918;

c) SELECT ship, battle FROM Outcomes WHERE result='sunk';

d) SELECT name FROM Ships WHERE name = class;

e) SELECT name FROM Ships WHERE name LIKE 'R%';

f) SELECT name FROM ships WHERE name LIKE '% % %';

5. **Exercise 6.1.5**:

a) Given $a = 10$, the sets of tuples that satisfy the condition is

$(10, -MAX\_INT), (10, -MAX\_INT + 1), \cdots (10, 0), \cdots, (10, MAX\_INT - 1),$
$(10, MAX\_INT), (10, NULL)$

Given $b = 20$, the sets of tuples that satisfy the condition is

$(-MAX\_INT, 20), (-MAX\_INT + 1, 20), \cdots (0, 20), \cdots, (MAX\_INT - 1, 20),$
$(MAX\_INT, 20), (NULL, 20)$

Given $a = 10$ and $b = 20$, the set of tuple that satisfy the condition is $(10, 20)$

b) Given $a = 10$ AND $b = 20$, the only set of (a, b) tuple that satisfy the condition is $(10, 20)$.

c) There are three cases to consider

1. $a < 10$

In this case, the set of (a, b) tuples that satisfy the condition is:

$(9, -MAX\_INT), (9, -MAX\_INT + 1), \cdots (9, 0), \cdots, (9, MAX\_INT - 1),$
$(9, MAX\_INT), (9, NULL)$

$(8, -MAX\_INT), (8, -MAX\_INT + 1), \cdots (8, 0), \cdots, (8, MAX\_INT - 1),$
$(8, MAX\_INT), (8, NULL)$

$\cdots$

$(-MAX\_INT + 1, -MAX\_INT), (-MAX\_INT + 1, -MAX\_INT + 1),$
$\cdots (-MAX\_INT + 1, 0), \cdots, (-MAX\_INT + 1, MAX\_INT - 1),$
$(-MAX\_INT + 1, MAX\_INT), (-MAX\_INT + 1, NULL)$

$(-MAX\_INT + 1, -MAX\_INT), (-MAX\_INT + 1, -MAX\_INT + 1),$
$\cdots (-MAX\_INT + 1, 0), \cdots, (-MAX\_INT + 1, MAX\_INT - 1),$
$(-MAX\_INT + 1, MAX\_INT), (-MAX\_INT + 1, NULL)$

2. $a >= 10$

   In this case, the set of (a, b) tuples that satisfy the condition is:

   $(10, -MAX\_INT), (10, -MAX\_INT + 1), \cdots (10, 0), \cdots, (10, MAX\_INT - 1),$
   $(10, MAX\_INT), (10, NULL)$

   $(11, -MAX\_INT), (11, -MAX\_INT + 1), \cdots (11, 0), \cdots, (11, MAX\_INT - 1),$
   $(11, MAX\_INT), (11, NULL)$

   $\cdots$

   $(MAX\_INT - 1, -MAX\_INT), (MAX\_INT - 1, -MAX\_INT + 1),$
   $\cdots (MAX\_INT - 1, 0), \cdots, (MAX\_INT - 1, MAX\_INT - 1),$
   $(MAX\_INT - 1, MAX\_INT), (MAX\_INT - 1, NULL)$

   $(MAX\_INT, -MAX\_INT), (MAX\_INT, -MAX\_INT + 1),$
   $\cdots (MAX\_INT, 0), \cdots, (MAX\_INT, MAX\_INT - 1),$
   $(MAX\_INT, MAX\_INT), (MAX\_INT, NULL)$

3. $a < 10$ AND $a >= 10$

   In this case, the result is NULL. So, no (a, b) tuples match this condition.