PROBLEM 1: More Aggregate Queries

1) List authors who wrote the most books (including ties).
   
   **Answer:** Author id and name

   **Query:**
   
   ```sql
   SELECT a.name, a.id, bookcount
   FROM
   (  
     SELECT a.name, a.aid, count(aid) AS bookcount  
     FROM wrote w, book b, author a  
     WHERE w.publication = b.pubid AND a.aid = w.author  
     GROUP BY a.aid, a.name  
   )
   WHERE bookcount in
   (  
     SELECT MAX(bookcount)  
     FROM
     (  
       SELECT a.name, a.aid, count(aid) AS bookcount  
       FROM wrote w, book b, author a  
       WHERE w.publication = b.pubid  
       AND a.aid = w.author  
       GROUP BY a.aid, a.name  
     )
   )
   ```

2) Find authors who wrote the longest article.

   **Answer:** Author id and name

   **Query 1 (max aggregate):**

   ```sql
   SELECT a.name, a.id
   FROM wrote w, article b, author a
   WHERE a.aid = w.author AND
     w.publication = b.pubid AND
     b.endpage - b.startpage IN
     (  
       SELECT MAX (endpage-startpage)  
       FROM article  
     )
   ```
Query 2 (subqueries):

```
SELECT a.name, a.id
FROM wrote w, article b, author a
WHERE a.aid = w.author AND
  w.publication = b.pubid AND
  NOT EXISTS
  (SELECT *
   FROM article b2
   WHERE (b.endpage - b.startpage) < (b2.endpage - b2.startpage)
  )
```

PROBLEM 2: Duplicates and NULLs

A) No.

B) ∀ x, y, z. book(x,y,z) → ¬ (∃ a, b, c. article(x,a,b,c))

C) Answer:
```
(SELECT R.a, R.b, S.c
  FROM R, S
  WHERE R.b = S.b)
UNION ALL
(SELECT R.a, R.b, Null
  FROM R
  WHERE R.b NOT IN
    (SELECT S.b
     FROM S)
  )
UNION ALL
(SELECT Null, S.b, S.c
  FROM S
  WHERE S.b NOT IN
    (SELECT R.b
     FROM R)
)