Question 5 (5 marks)

Consider two tables `R(x,y,z)` and `S(a,x,b)` with b_R = 100 and b_S = 20, and a natural join on these two tables (via attribute `x`). If we have a buffer pool with B = 20 buffers, then calculate how many pages would be read/written when performing the join operation using the methods below. Do not include the cost of writing the final result.

a. Block nested loop join, with `R` as outer table and `S` as inner.

b. Sort merge join, using intermediate files for sorting.
Do not assume any sort order on the original files.

c. Grace hash join, with `R` as outer table and `S` as inner.
Use buffers as appropriate for input, output and in-memory hash tables.
You can assume that all hash functions distribute tuples uniformly
and that all partitions of `R` will fit in the in-memory hash table.

Show all working.

Instructions:

- Type your answer to this question into the file called `q5.txt`
- Submit via: **`give cs9315 exam_q5 q5.txt`**
  or via: Webcms3 > exams > Final Exam > Submit Q5 > Make Submission

End of Question