COMP5112. Tutorial 13: Query processing

The following questions are adapted from "Database System Concepts".

Question 1.

Let relations r1(A, B, C) and r2(C, D, E) have the following properties:
r1 has 20,000 tuples, r2 has 45,000 tuples,
25 tuples of r1 fit on one block, and 30 tuples of r2 fit on one block.
The memory contains M=**150** blocks.
Estimate the number of block transfers using each of the following join strategies for r1 ⋈ r2:

- Block nested-loop join
- Merge join (assume that both r1 and r2 are unsorted)
- Hash join

Solution of Question 1:

[Block nested-loop join]

[Merge join]

[Hash join]

Question 2.

Assume that only one tuple fits in a block and the memory can hold M=3 blocks.
Show the runs created on each pass of the external sort-merge algorithm
when applied to sort the following tuples on the first attribute:

(kangaroo, 17), (wallaby, 21), (emu, 1), (wombat, 13), (platypus,3), (lion, 8), (warthog, 4), (zebra, 11), (meerkat, 6), (hyena, 9), (hornbill, 2), (baboon, 12)

Solution of Question 2:

The initial runs are:
