1. The following diagram represents, detail inside an MBR, Mj, with X-bounds, 0.2 bound and 0.3 shown, A, B & C represent a one-dimensional representation of children MBRs of Mj and Q is a PTQ (Probabilistic Threshold Query) occurring at that interval as shown in the diagram and has a probability threshold 0.3, does any of the child MBR’s, A, B, C satisfy Q? Show your work.

Answer:
None of the child MBR’s satisfies the query Q.

Solution:
Though Q’s interval overlaps with Mj’s interval, it does not cross X bound 0.2. What this means is that none of the entries in Mj, including its children MBR’s have items with probability greater than 0.2. Hence the children nodes A, B & C need not be examined to see if it satisfies the query. Further, MBR of B appear to overlap with Q’s interval, notice that the items of B overlapping with Q cannot have a probability more than 0.2 and Q’s probability threshold is 0.3, hence will be pruned out from the query.

Source of diagram/concept:
R. Cheng, Y. Xia, S. Prabhakar, R. Shah, and J. Vitter.

2. Take a look at the following table which illustrates join over uncertain data and provide query answers for PJQ (Probabilistic Join query) and PTJQ (probabilistic threshold join query).
Solution:
In the case of the PJQ, the output is a set of tuples that satisfy the uncertainty interval along with the probability value as,

(A1, B1), 0.1
(A1, B2), 0.7
(A2, B3), 0.8
(A2, B3), 0.2

In the case of PTJQ, only the tuples that satisfy the uncertainty interval and the join probability above the threshold value are reported as,

(A1, B2)
(A2, B3)

Source: