Parametric Query Optimization

by
S.V.U. Maheswara Rao
M.Tech, I.I.T., Kanpur.

Lucent Technologies

Partial Order

- Let p_1, p_2 are two plans.
- s and t are unknown selectivities.
    - $C(p_1,\ s,\ t) = a_1 + b_1.s + c_1.t + d_1.s.t$

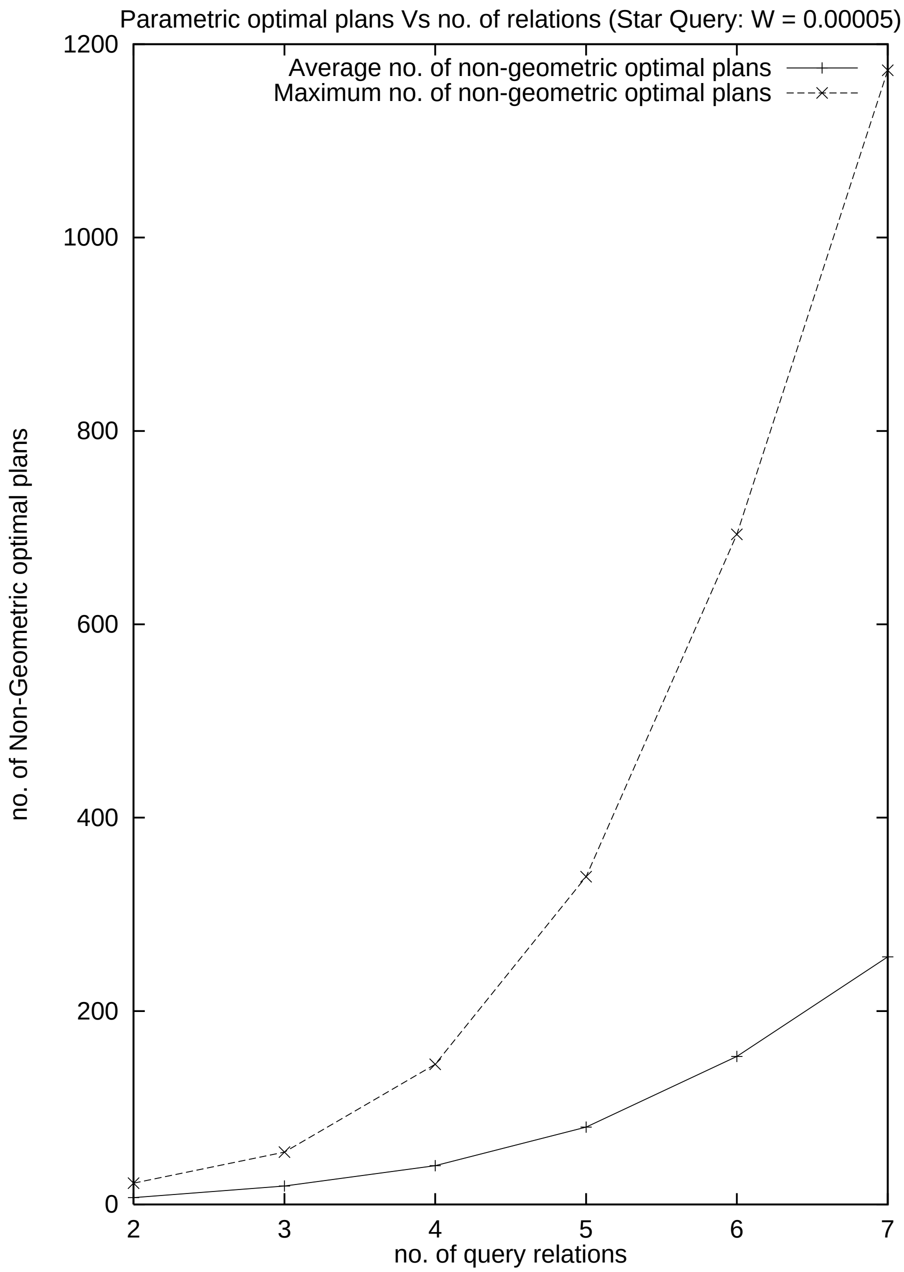
      $C(p_2,\ s,\ t) = a_2 + b_2.s + c_2.t + d_2.s.t$
- $p_1 \leq_{NG} p_2$ if

  $a_1 \leq a_2$ and
  $(a_1 + b_1) \leq (a_2 + b_2)$ and
  $(a_1 + c_1) \leq (a_2 + c_2)$ and
  $(a_1 + b_1 + c_2 + d_2) \leq (a_2 + b_2 + c_2 + d_2)$
- If $p_1 \leq_{NG} p_2$, then for all values of the parameters s and t,

$$C(p_1,\ s,\ t) \leq C(p_2,\ s,\ t)$$

- Yields superset of Parametric optimal set of plans.

Non-geometric Optimal Plans (2DNL)



Department of Computer Science and Engineering, IIT Kanpur, INDIA

A Preliminary Sampling Approach

- Pick random parameter values.
- Find optimal plans at these values.
- Yields subset of parametric optimal plans.
- Maximum error over 24000 queries is 55%.
- Average error is 0.1%.
- Number of samples is approximately $(2\sqrt{g} + 6)^2$
- g is the average number of parametric optimal plans.