DBDBD 2016

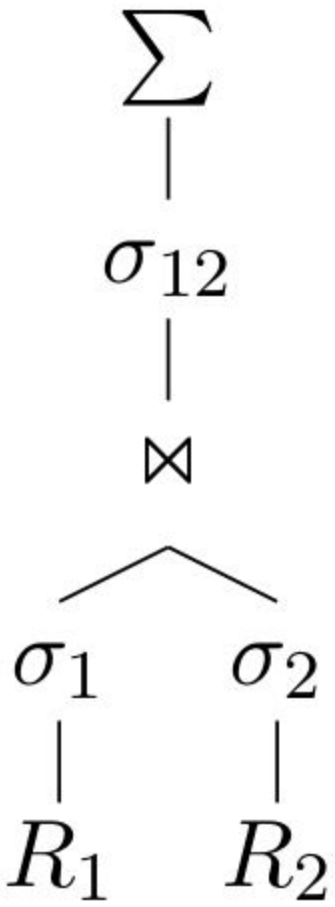
Estimating Aggregates Over Joins

Abe Wits

with thanks to my supervisors

Hannes Mühleisen & Lefteris Sidirourgos

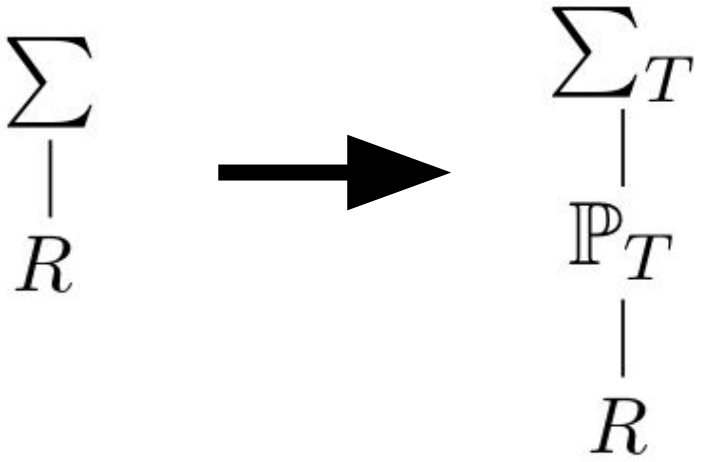
Setting



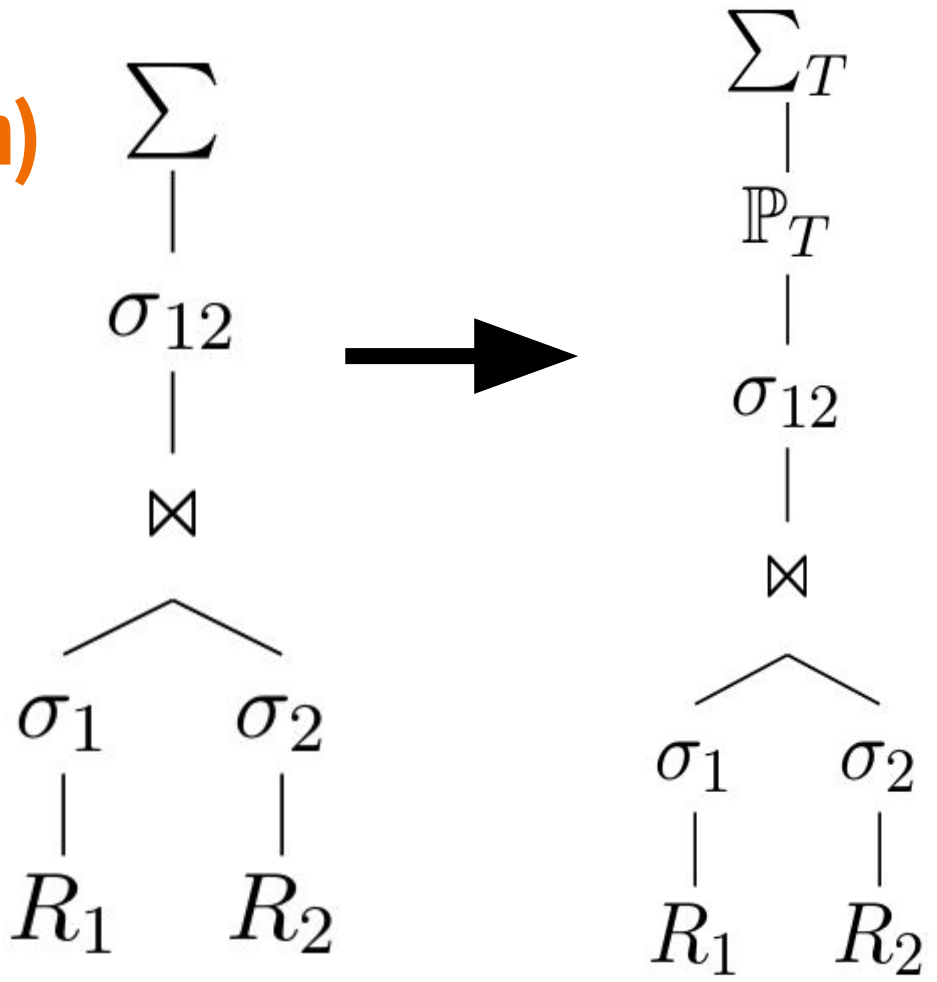
Estimating Sums

$$S \subset R$$

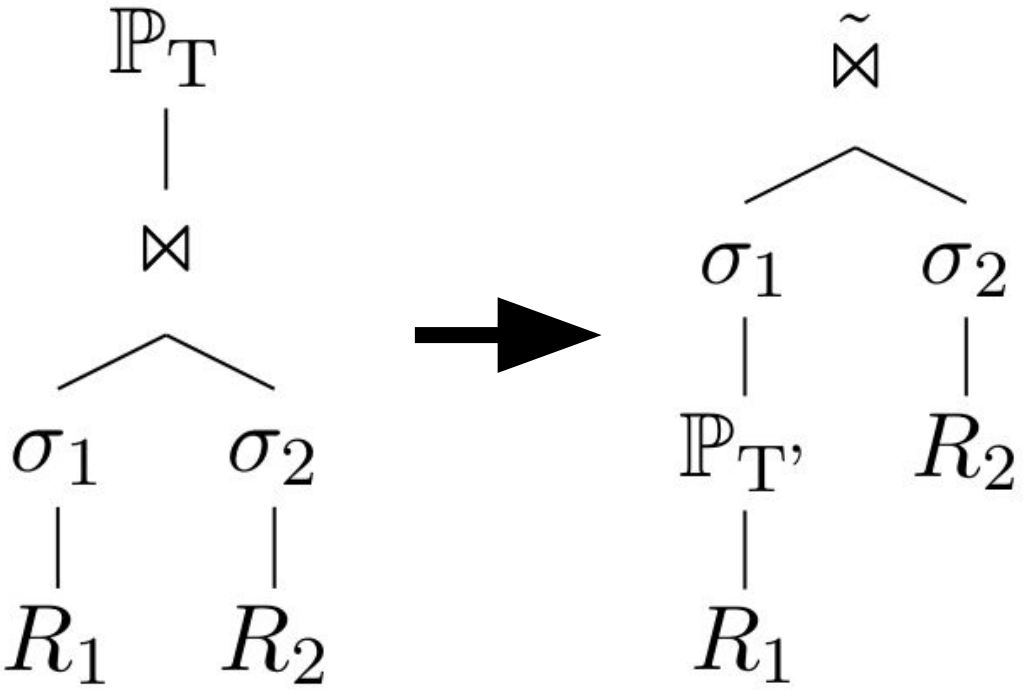
$$\sum R \approx \frac{|R|}{|S|} \sum S$$



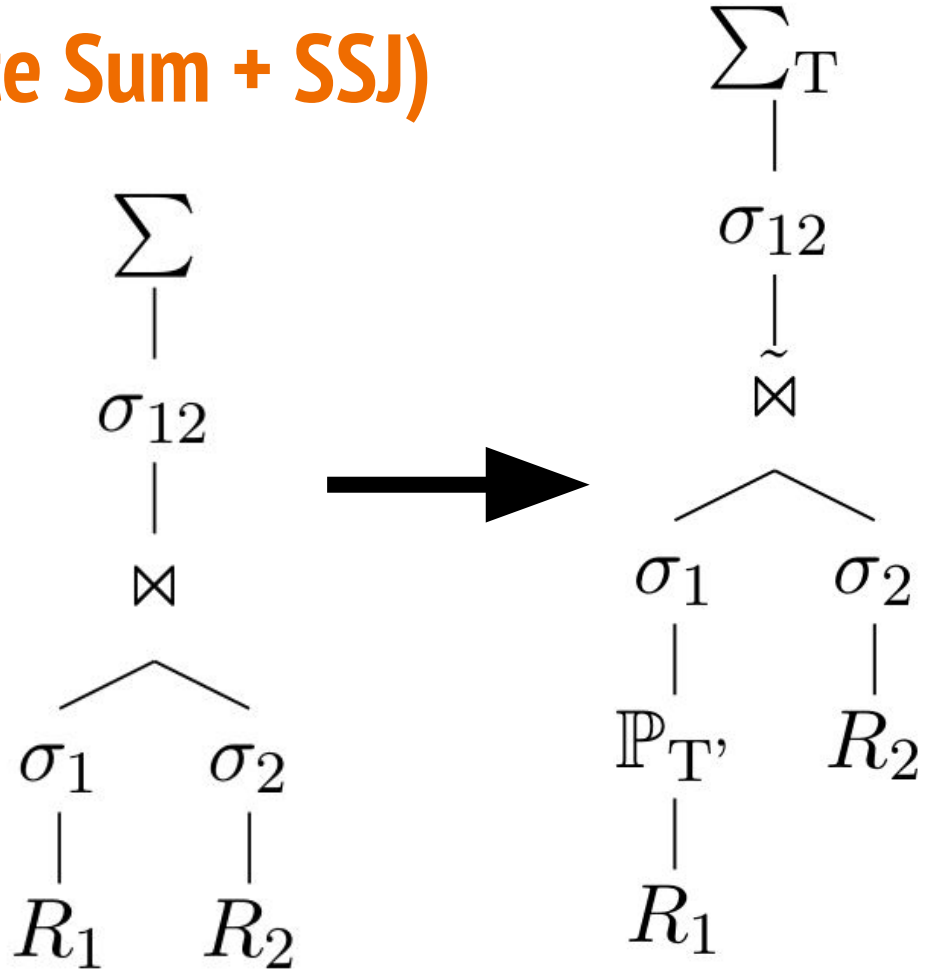
Setting (Estimate Sum)



Pushing Sampling down Join (SSJ)



Setting (Estimate Sum + SSJ)



Improve on this!

1) $\sum R \approx \sum_T S \subset R$ can be improved

2) $\mathbb{P}_{T'} \mid R_1$ takes O($|R_1|$)

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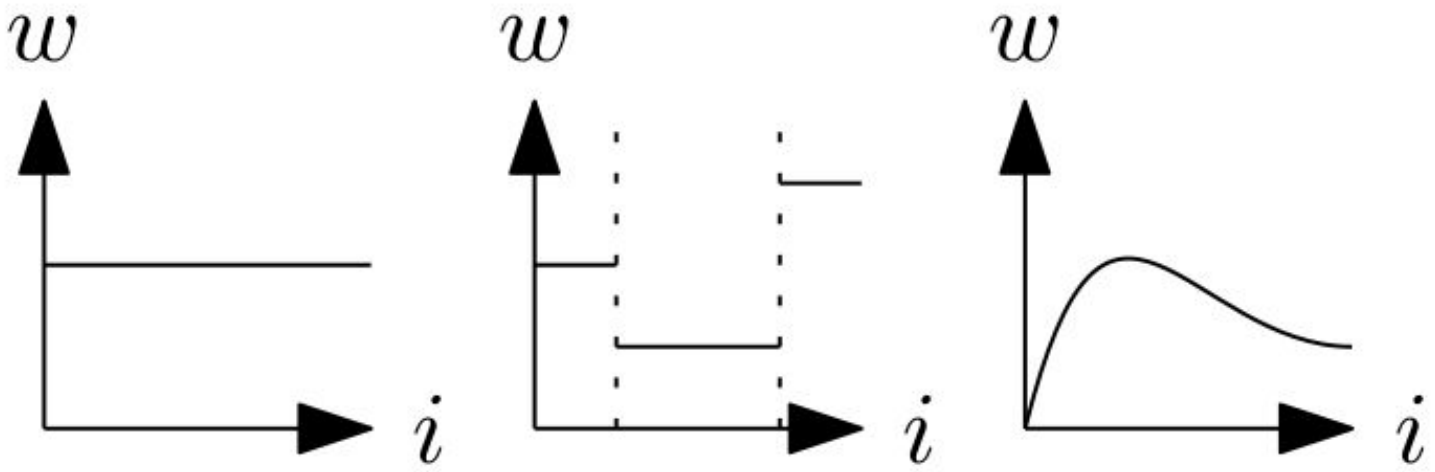
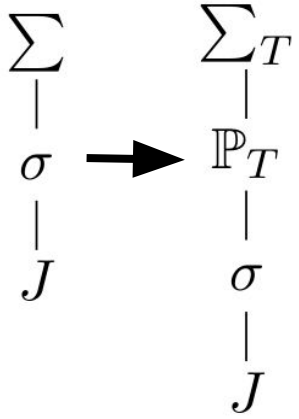
Estimating Sums $\sum R \approx \sum_T S \subset R$

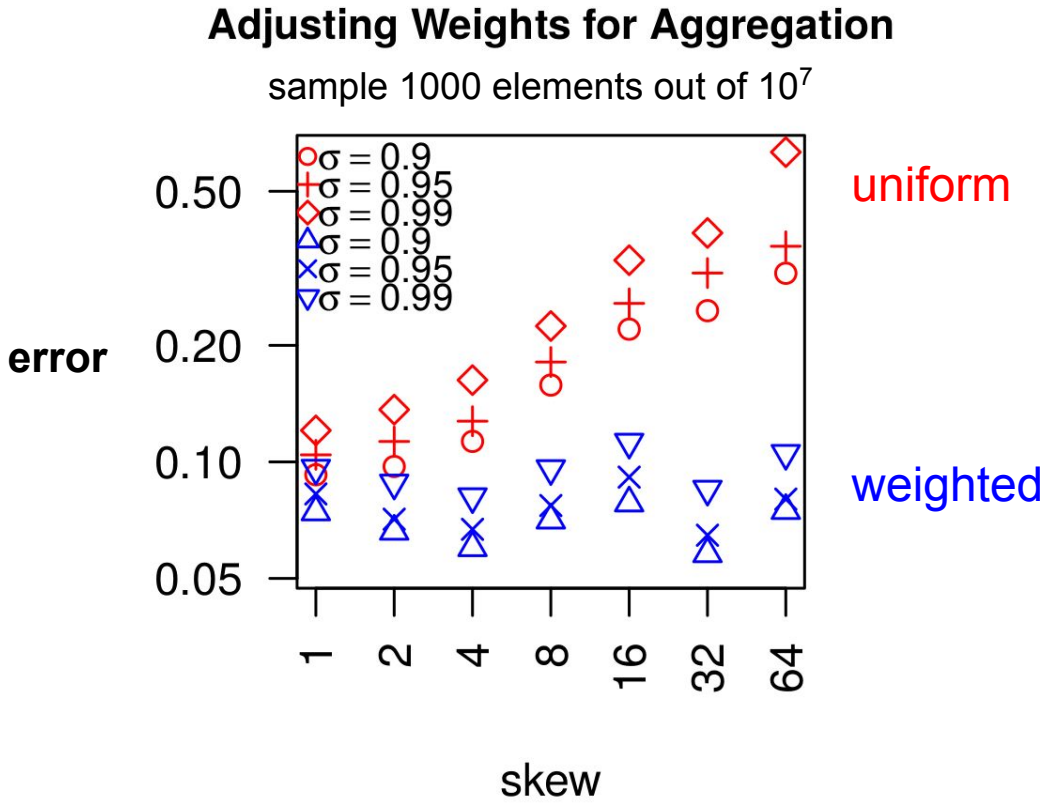
uniform stratified weighted





$$\frac{|R|}{|S|}\sum S \qquad \sum_{i=1}^{\#\text{strata}} |R_i|\text{avg}(S_i) \qquad \frac{1}{|S|}\sum_{i=1}^{|S|}\frac{s_i}{p_i}$$

This matters!



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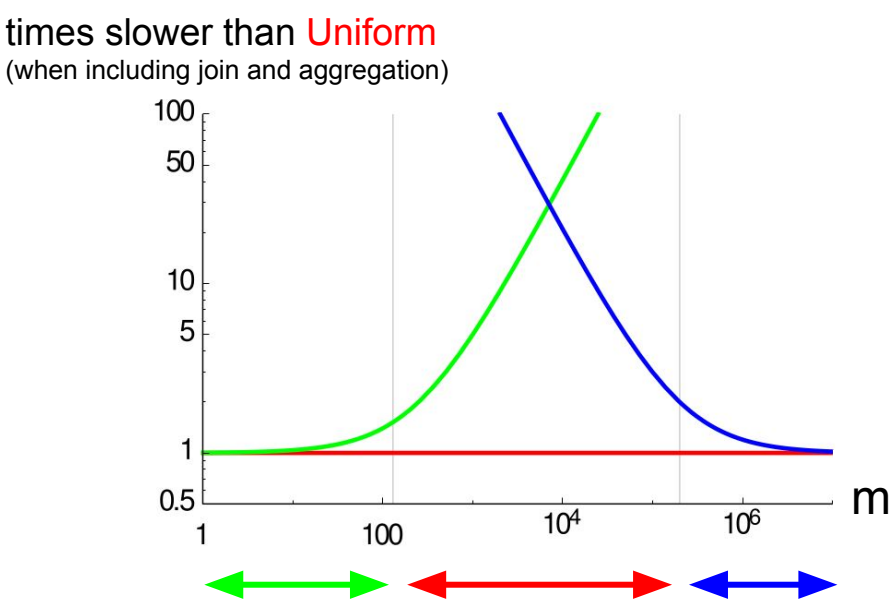
Faster Sampling

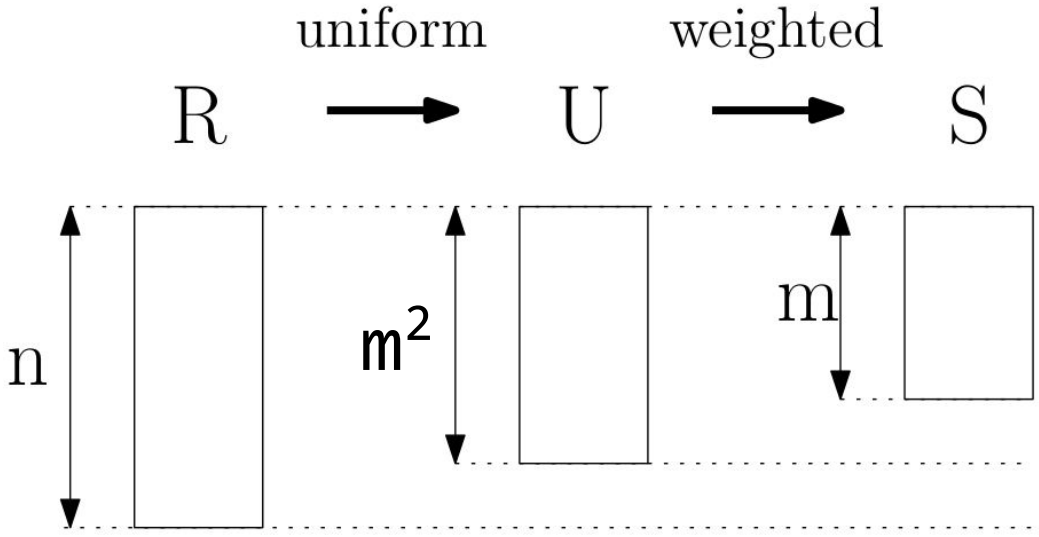
$$\mathbb{P}_{T'} \Big| R_1$$



Cost of taking size m sample:

- Default $O(|R_1|)$
- Heuristic Sampling $O(m^2)$
- Use CDF of R_1 $O(m \log |R_1|)$
- Uniform $O(m \log |R_1|)$

Heuristic Sampling



Questions?