ComS 363 Spring 2022

Class Participation

Learning objective:

- Explore join algorithms and disk I/O costs.

Question:

The instances of the food relation and the recipe relation are below. The underlined attribute(s) indicate the primary key.

recipe

fid	iid	amount
1	1	50g
1	2	60g
2	1	20g
2	3	10g
4	3	100g

food

fid	fname
1	Pizza
2	Hummus
3	BBQ
4	Noodle

Assumption: Each disk page is large enough to store at most two rows of the food table at a time or two rows of the recipe table at a time. However, a page can only store at most one row of the join result of the above query at a time. Assume that each page stores as many rows as it can.

```
select * from food inner join recipe on food.fid=recipe.fid
```

a) Draw a query execution plan for the above query using the page-at-a-time simple-nested loops join algorithm. Let food be the outer relation and recipe be the inner relation.

b) Work through the page-at-a-time simple-nested loops join algorithm for the query using the above instances of food and recipe relations.

c) Calculate the disk I/O cost when using the page-at-a-time simple nested loops join algorithm.

d) stimate the disk I/O cost when using the block nested loops join algorithm. Suppose the total database memory buffer to perform the join operation is 6 pages.

e) Draw a query execution plan for the above query using the indexed nested loops join algorithm. Let the food relation be the outer relation and the recipe relation be the inner relation.