Programming Assignment: Operators

- Implement the following physical operators in the iterator model:
  - Print
  - Projection
  - Select
  - Sort
  - HashJoin
  - HashAggregation
- Optional:
  - Union
  - UnionAll
- For 2 additional points:
  - Intersect
  - IntersectAll
  - Except
  - ExceptAll
- Supported types for registers: INT64, CHAR(16)
Iterator Model Operators

\[ \Gamma \rightarrow^\sigma R \rightarrow S \]
Iterator Model Operators

\[
\text{next()}
\]

Call \text{next()} on root operator (aggregation)
Iterator Model Operators

Call \texttt{next()} on selection

\begin{tikzpicture}[level distance=1.5cm,sibling distance=1.5cm]
  \node {$\Gamma$}
  child {node {$\sigma$}
      child {node [draw]{}
          child {node {R}}
          child {node {S}}
      }
  }
  child {node {$\text{next()}$}}
  child {node {$\text{next()}$}}
\end{tikzpicture}
Iterator Model Operators

next()  
\[ \Gamma \]  
next()  
\[ \sigma \]  
next()  
\[ \times \]  

R \quad S

Call next() on hash join
Iterator Model Operators

Build hash table for the left side by calling \texttt{next()} of R repeatedly
Iterator Model Operators

Call `next()` on S, returns true as long as there are tuples left.
Iterator Model Operators

Build hash table for aggregation by calling `next()` of the selection repeatedly.
Iterator Model Operators

\[
\text{next()}
\]

\[

\Gamma \quad \sigma \\
\text{Generate next value from the hash table}
\]

\[
R \quad S
\]