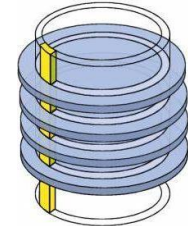


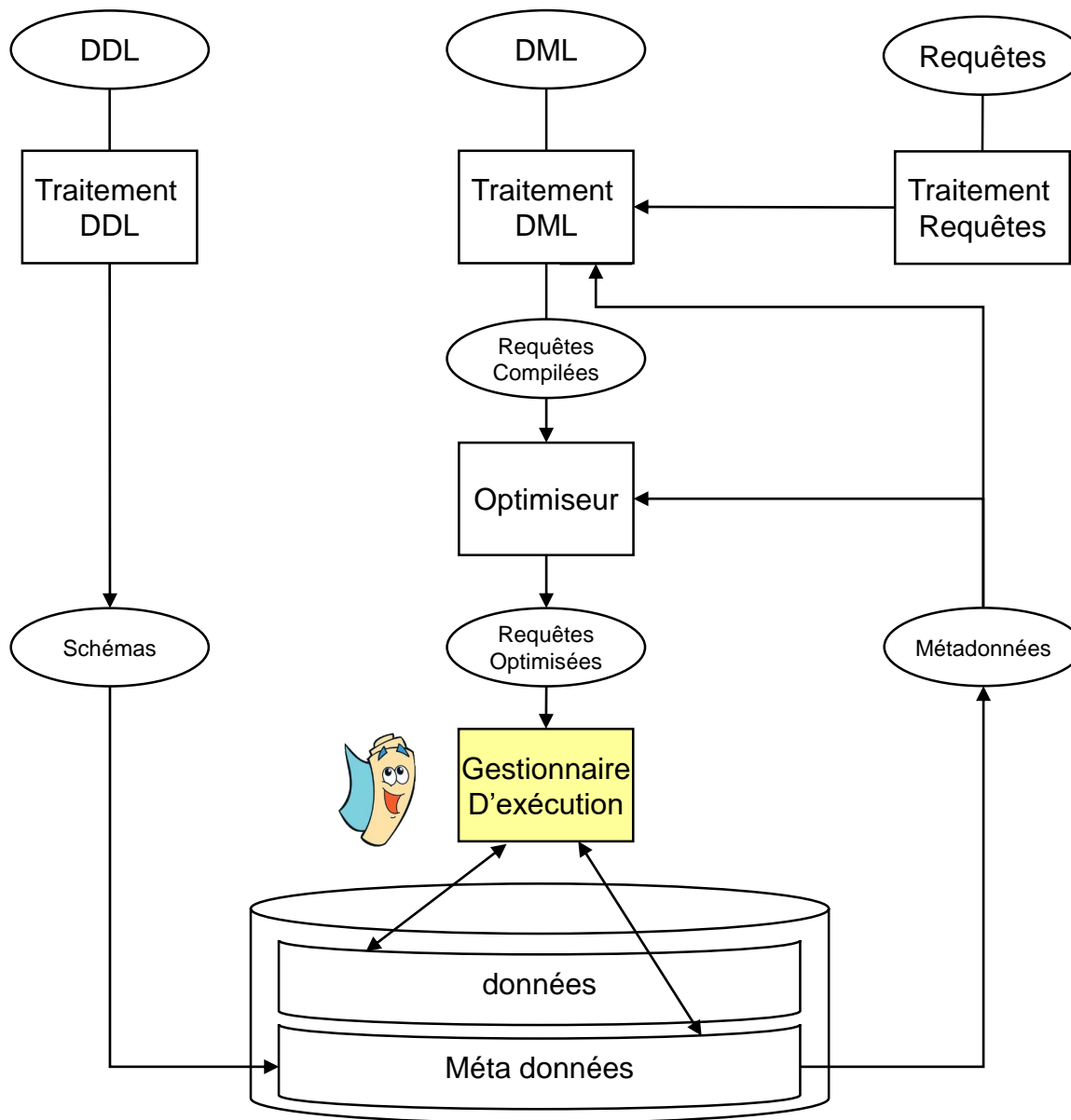


Architectures des Systèmes de Bases de Données



“Disk” Nested Loop Join
“External” Nested Loop Join
Jointure en “mémoire externe”

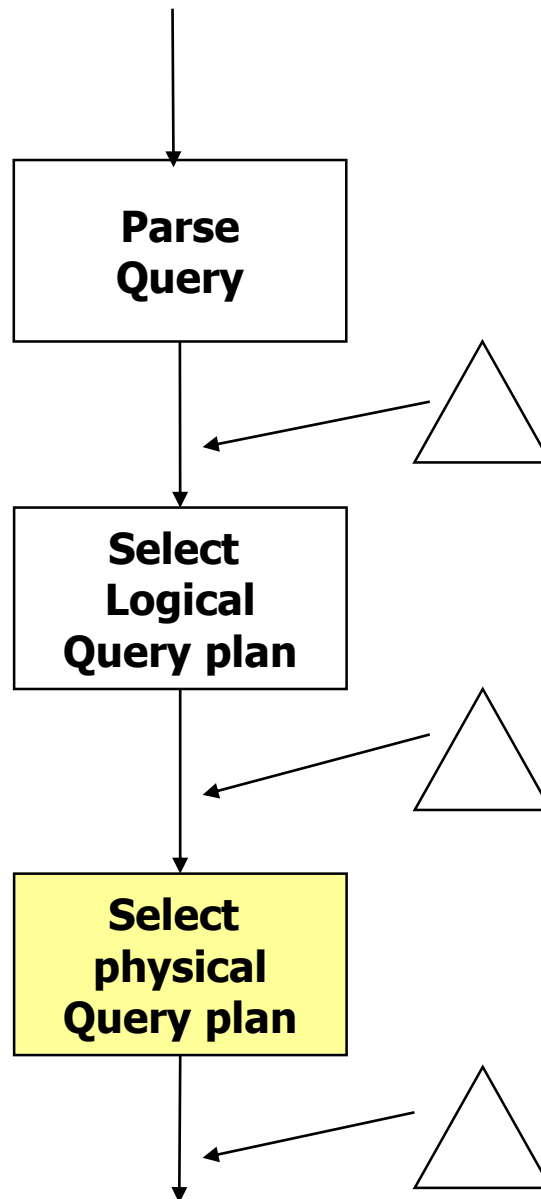
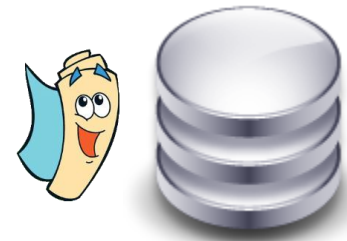




D'après C.J DATE

DDL : langage de définition des données; DML : langage de manipulation des données

From Ullman



Query expression
tree

Logical Query
Plan tree

Physical Query
Plan tree

Du modèle au code



Modèle

-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Algèbre

$\sigma_{\text{owner1}=\text{owner2}} (\text{Cats} \otimes \text{Dogs}) = \text{Cat} \bowtie \text{Dogs}$

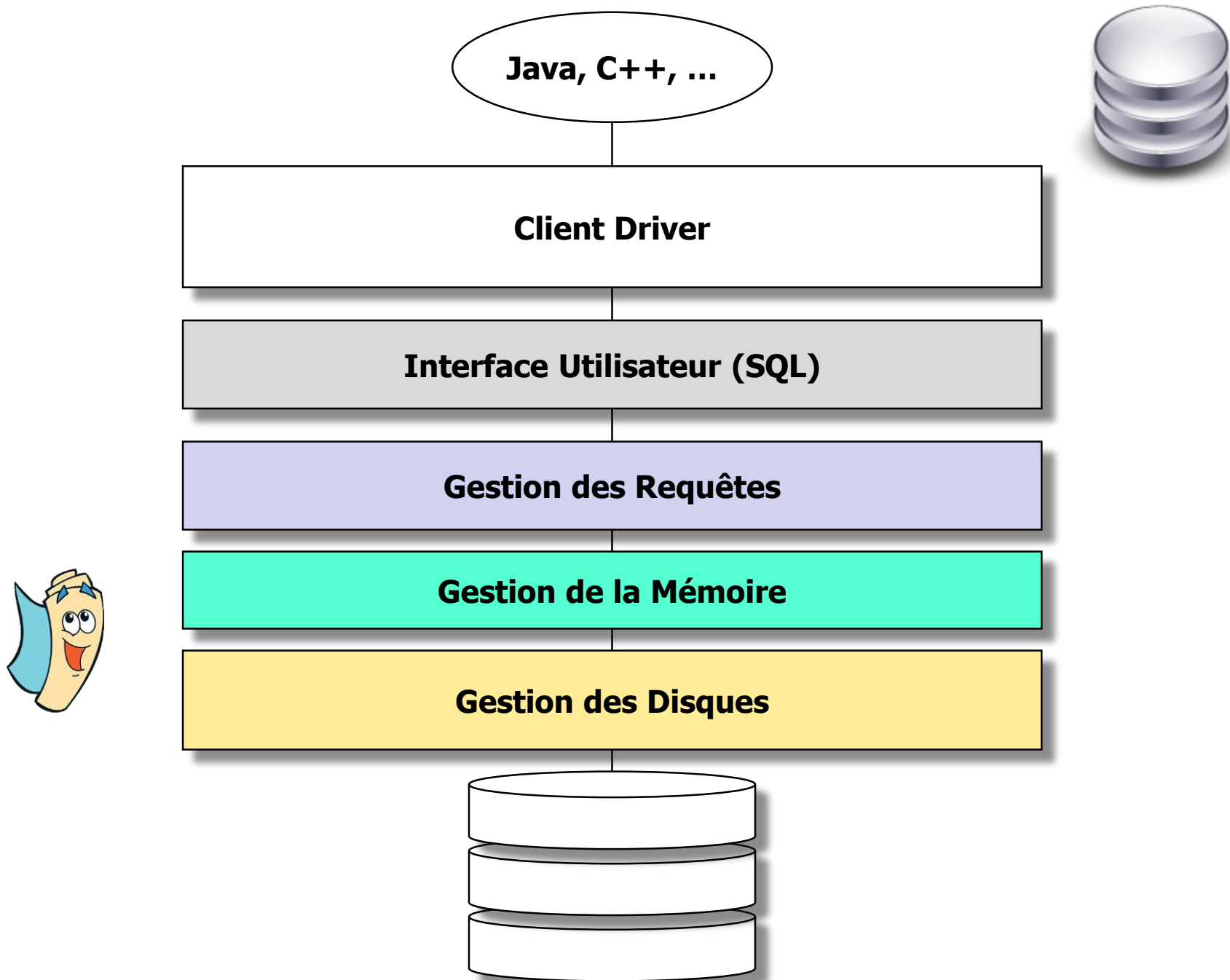


Logiciel

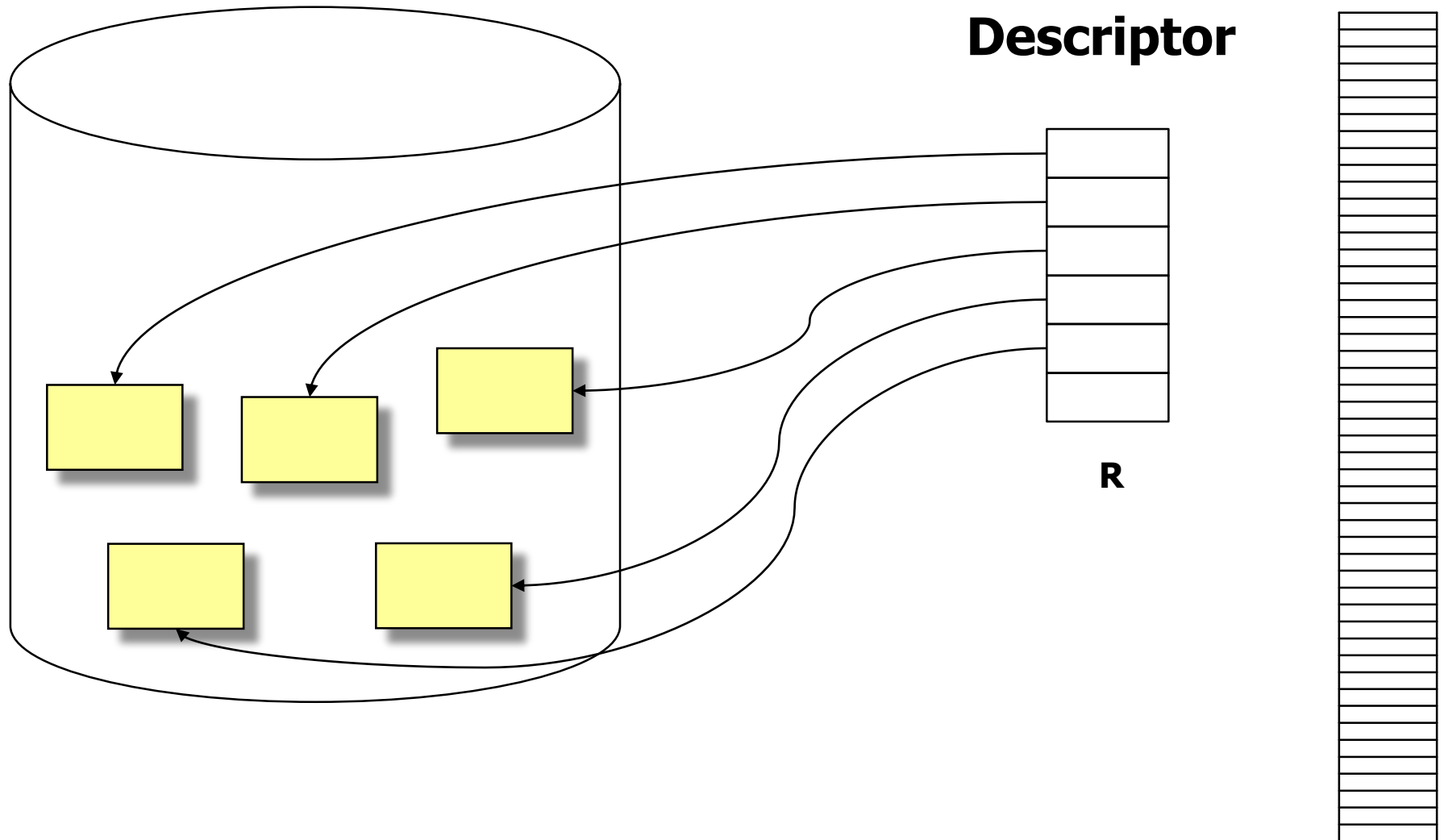


Java, C++, ..

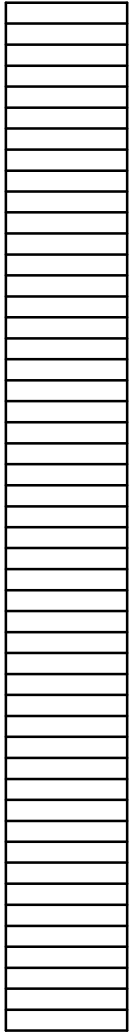




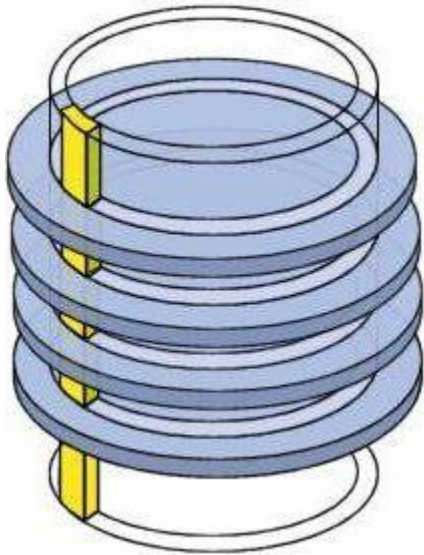
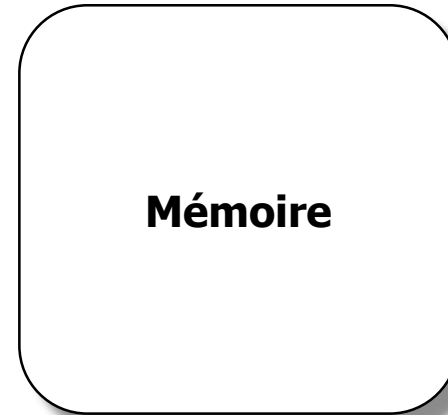
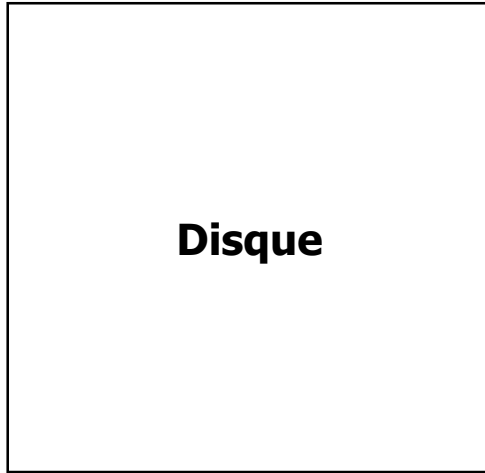
Descripteur de Relation



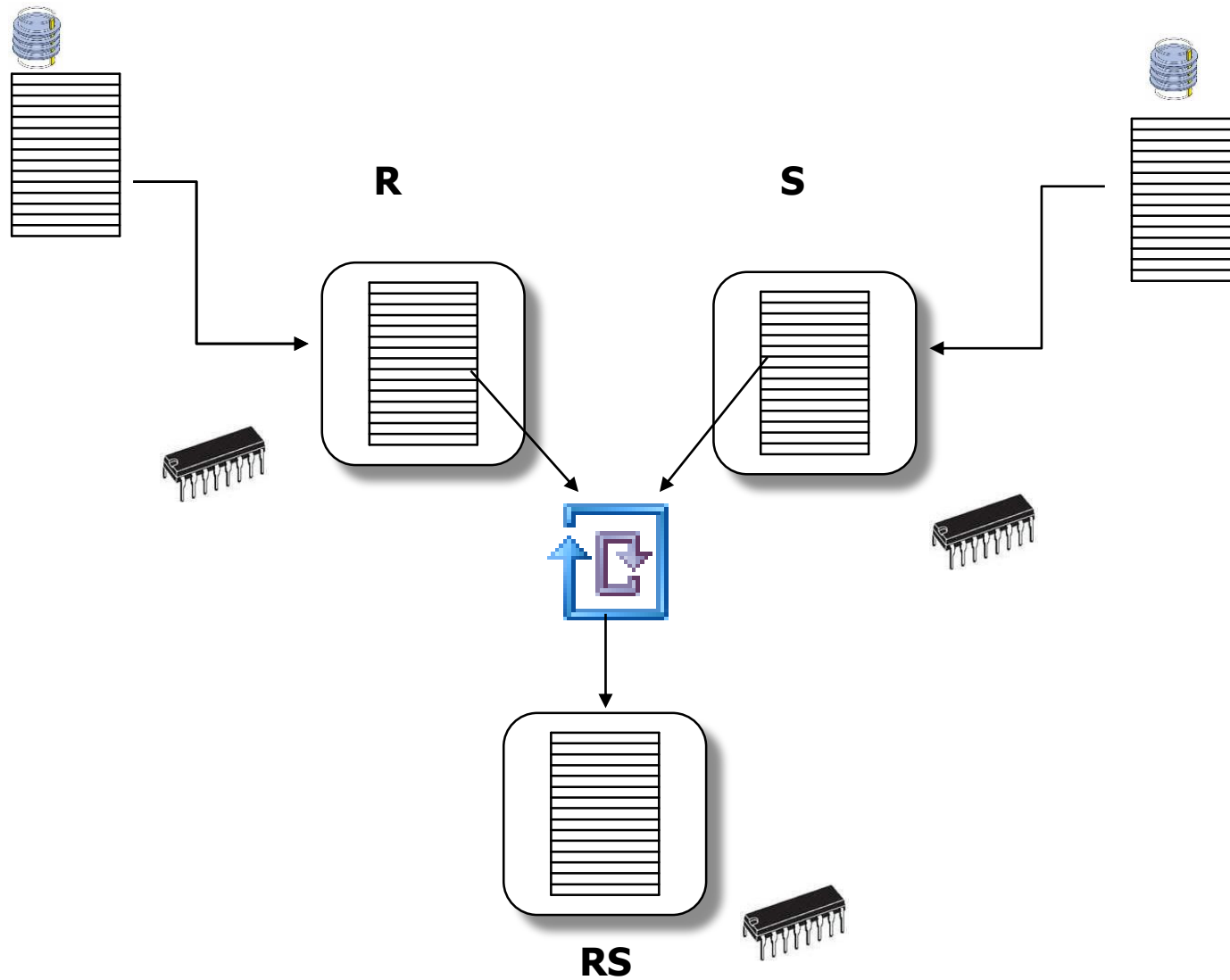
The diagram illustrates a Reinforcement Learning environment. A large cylinder represents the environment. Inside, five yellow rectangular blocks are arranged. A stack of five horizontal lines represents the state space, with an arrow pointing to it labeled **R**. Curved arrows show transitions from the state space to each of the five blocks, representing the action space.



Légende

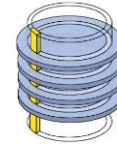
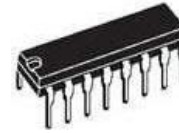
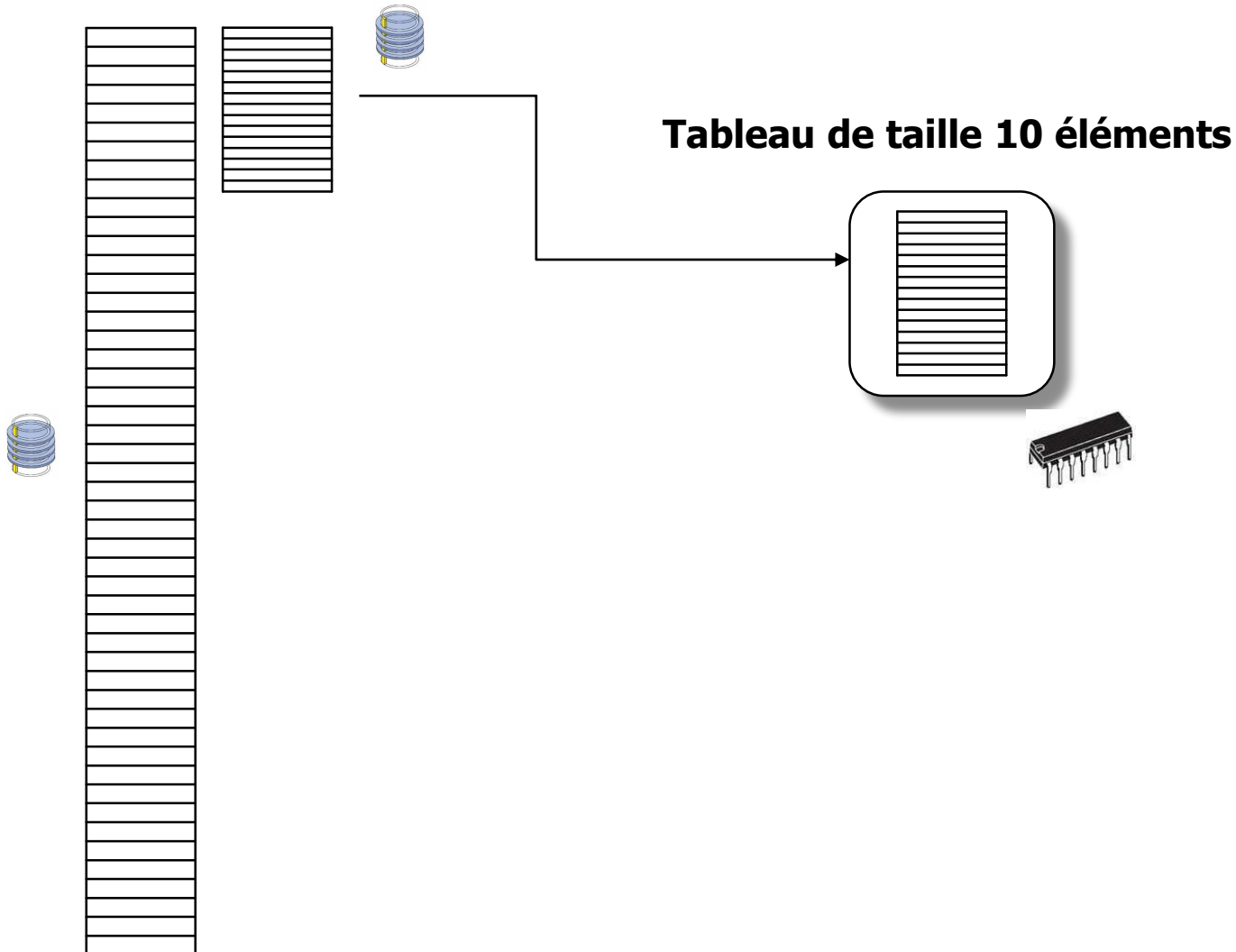


Nested Loop Join

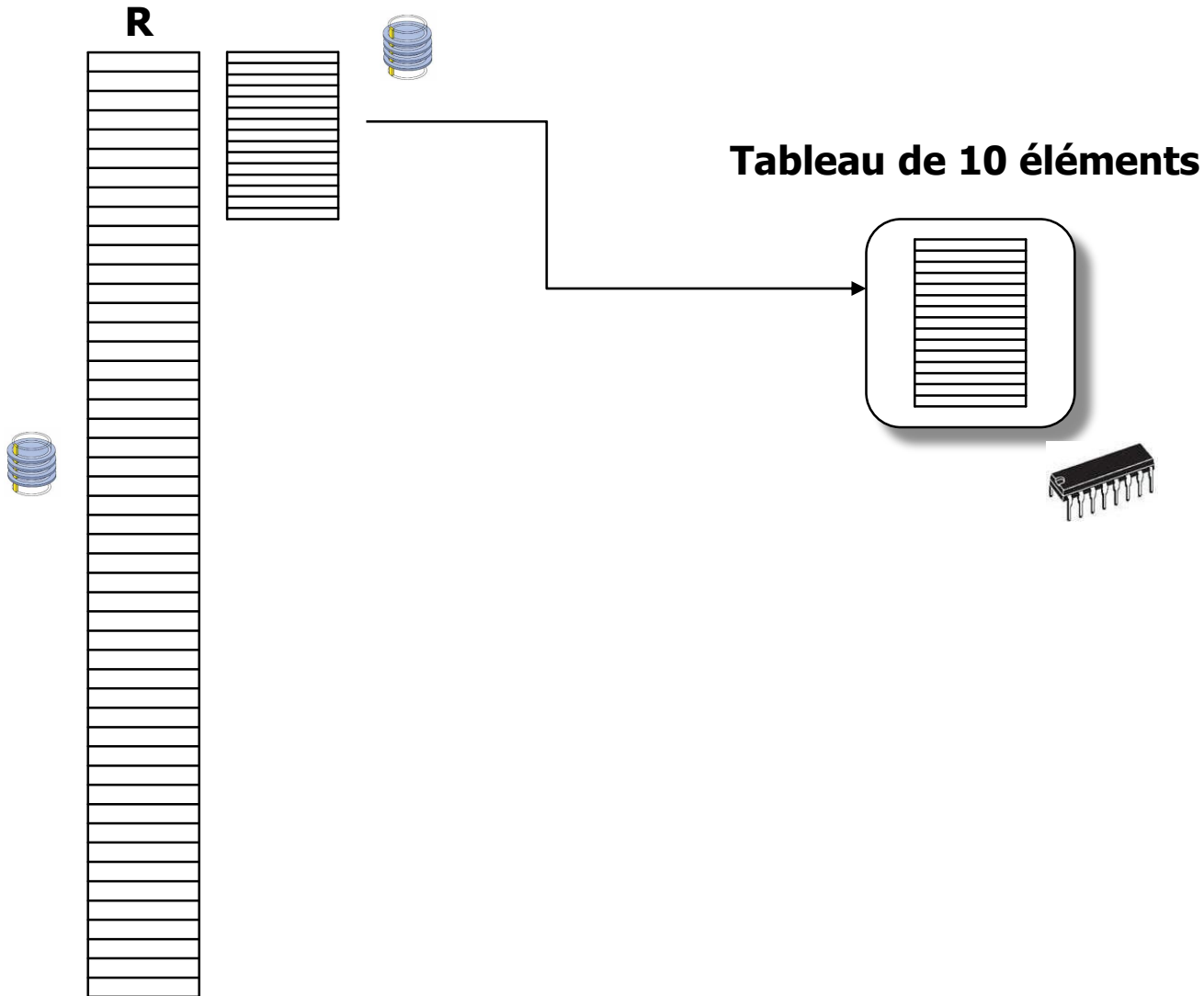


Lecture de R et S

**R et S
Sur Disque**

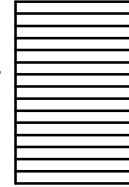
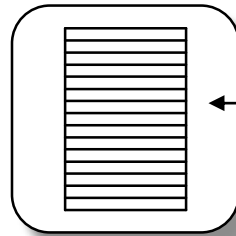


Lecture de R



Lecture de S

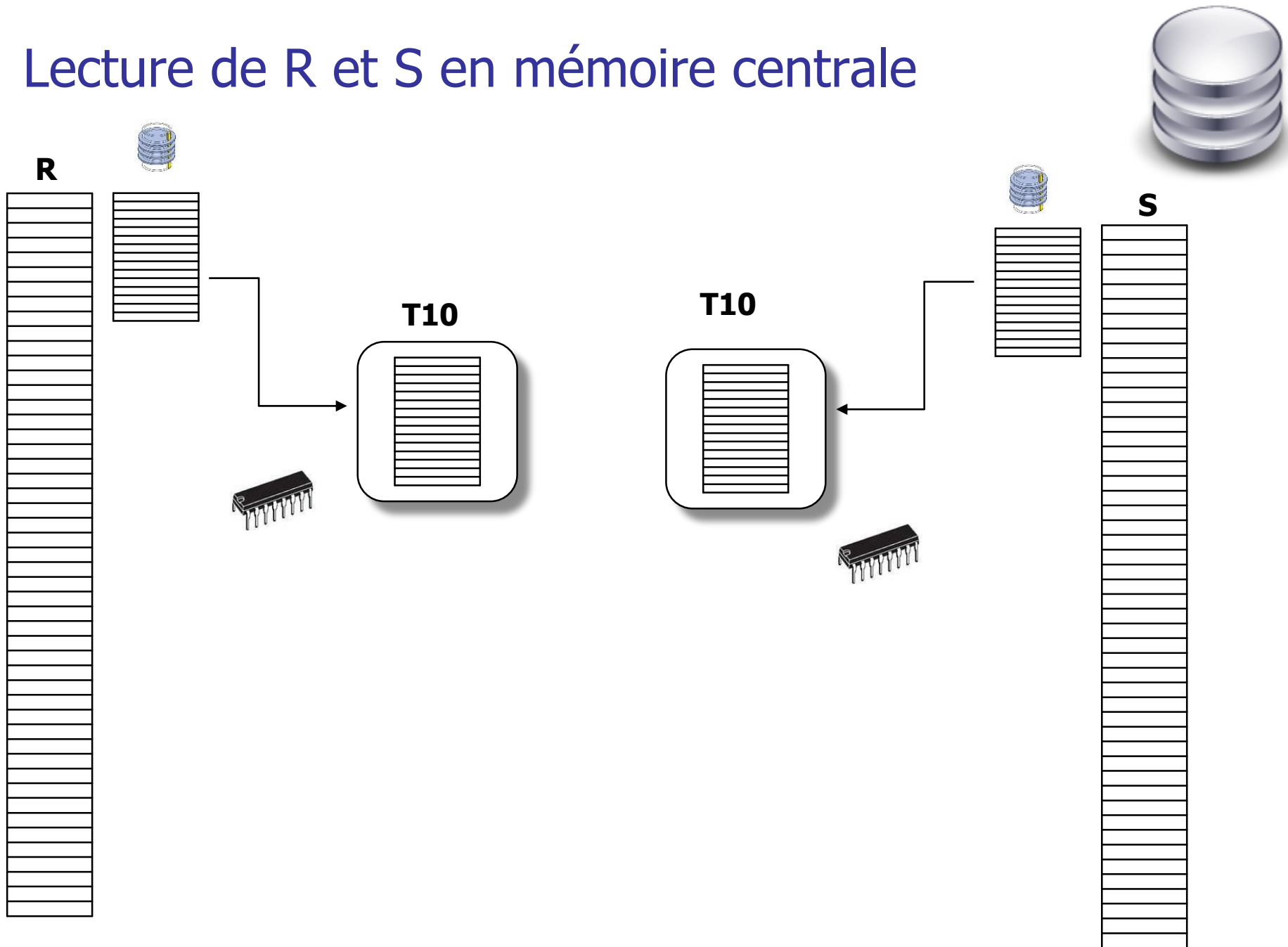
Tableau de 10 éléments



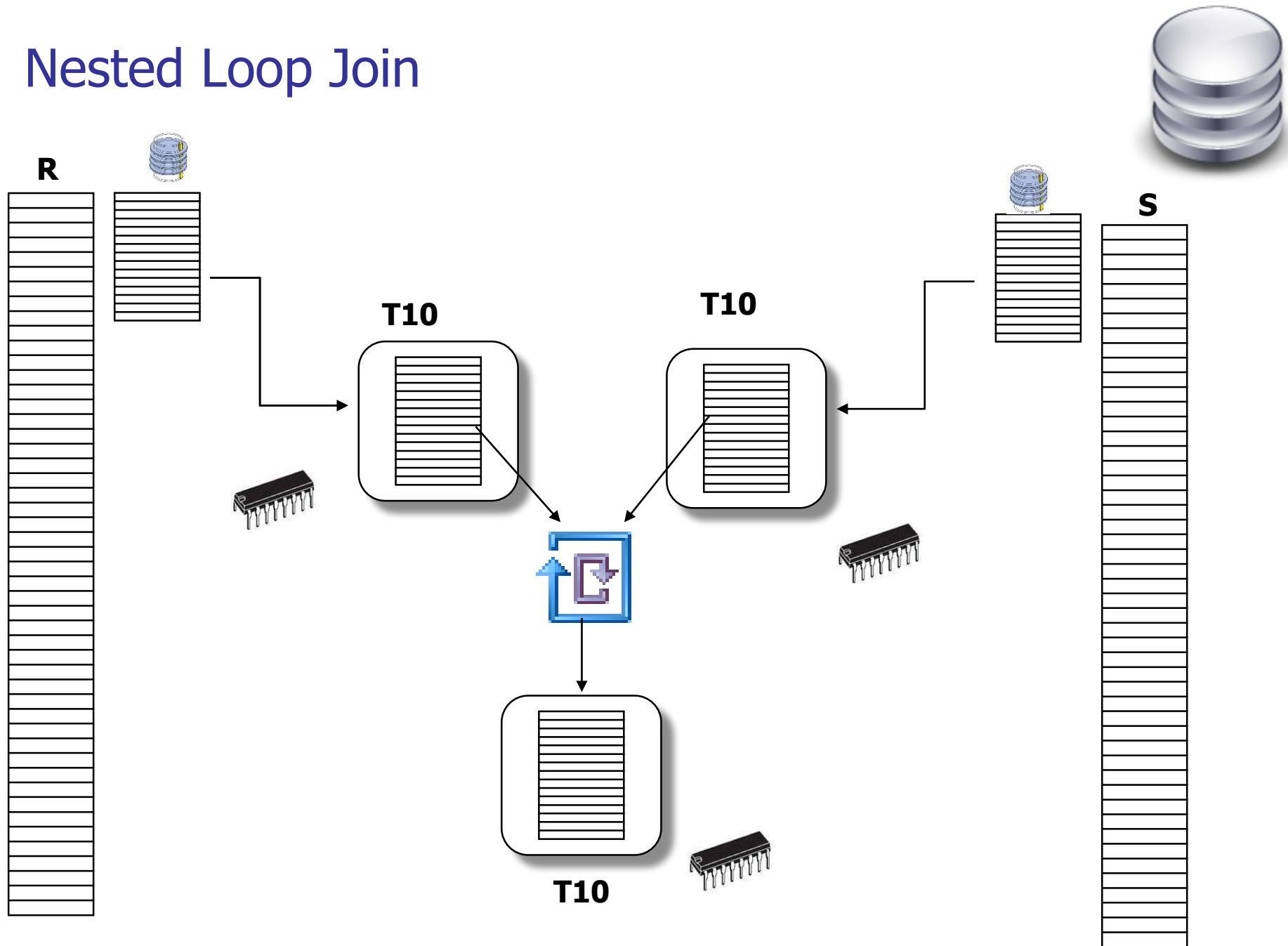
S



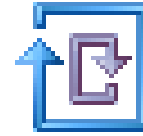
Lecture de R et S en mémoire centrale



Nested Loop Join

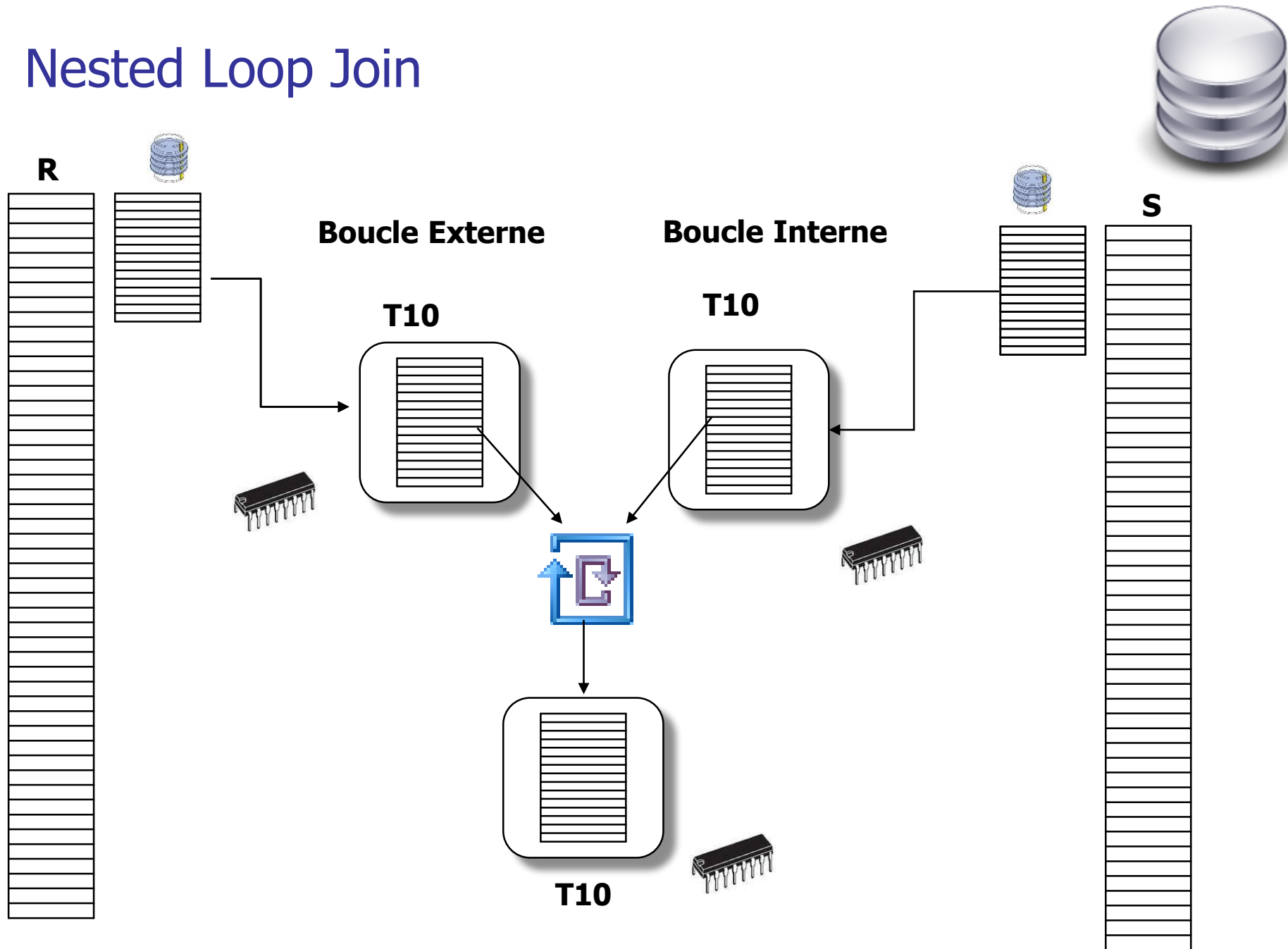


External nested loop join

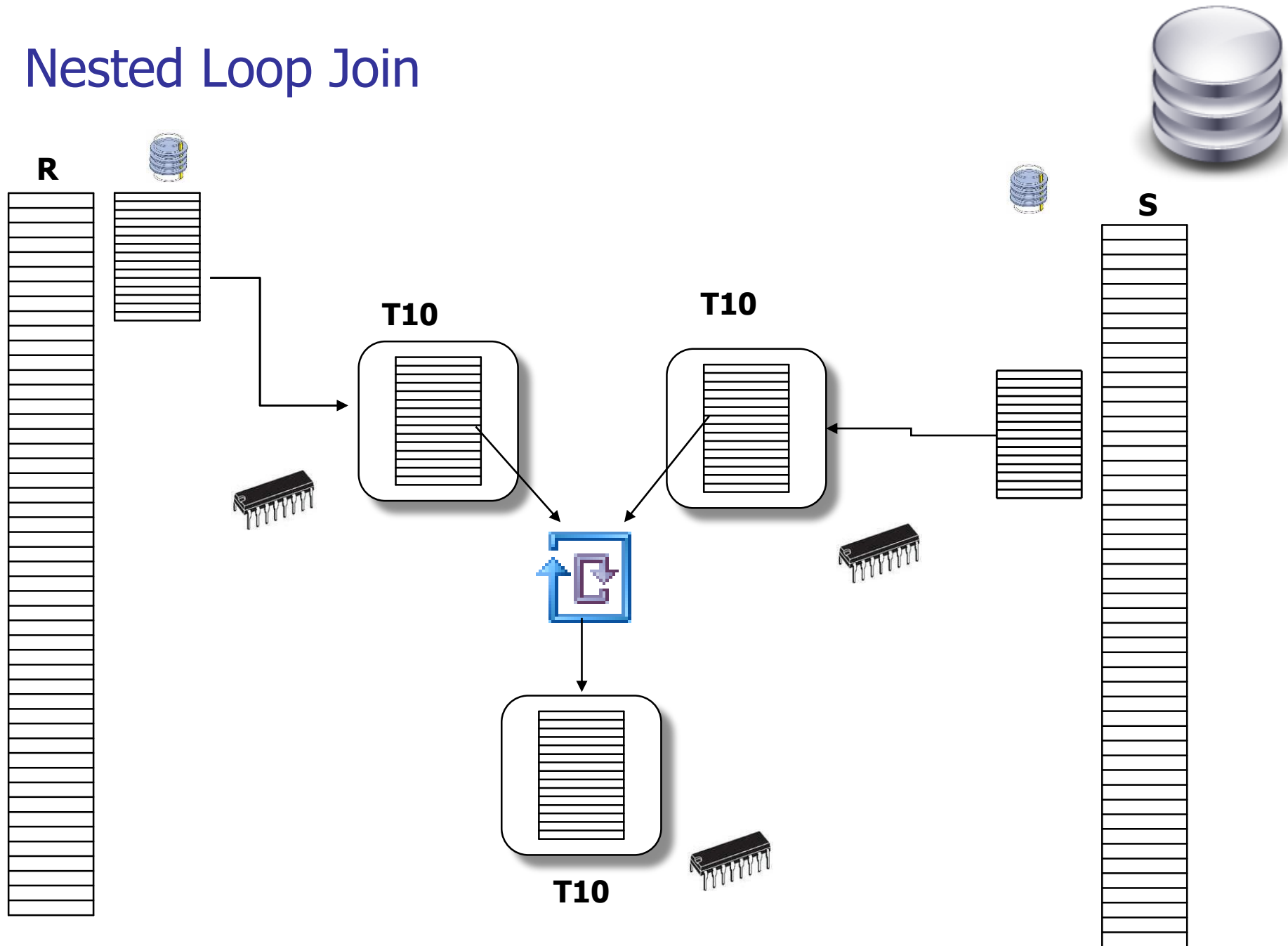


```
While block in (R)
    Read block r;
    While block in (S)
        Read block s;
        NestedLoop (r,s);
    end While;
End While;
```

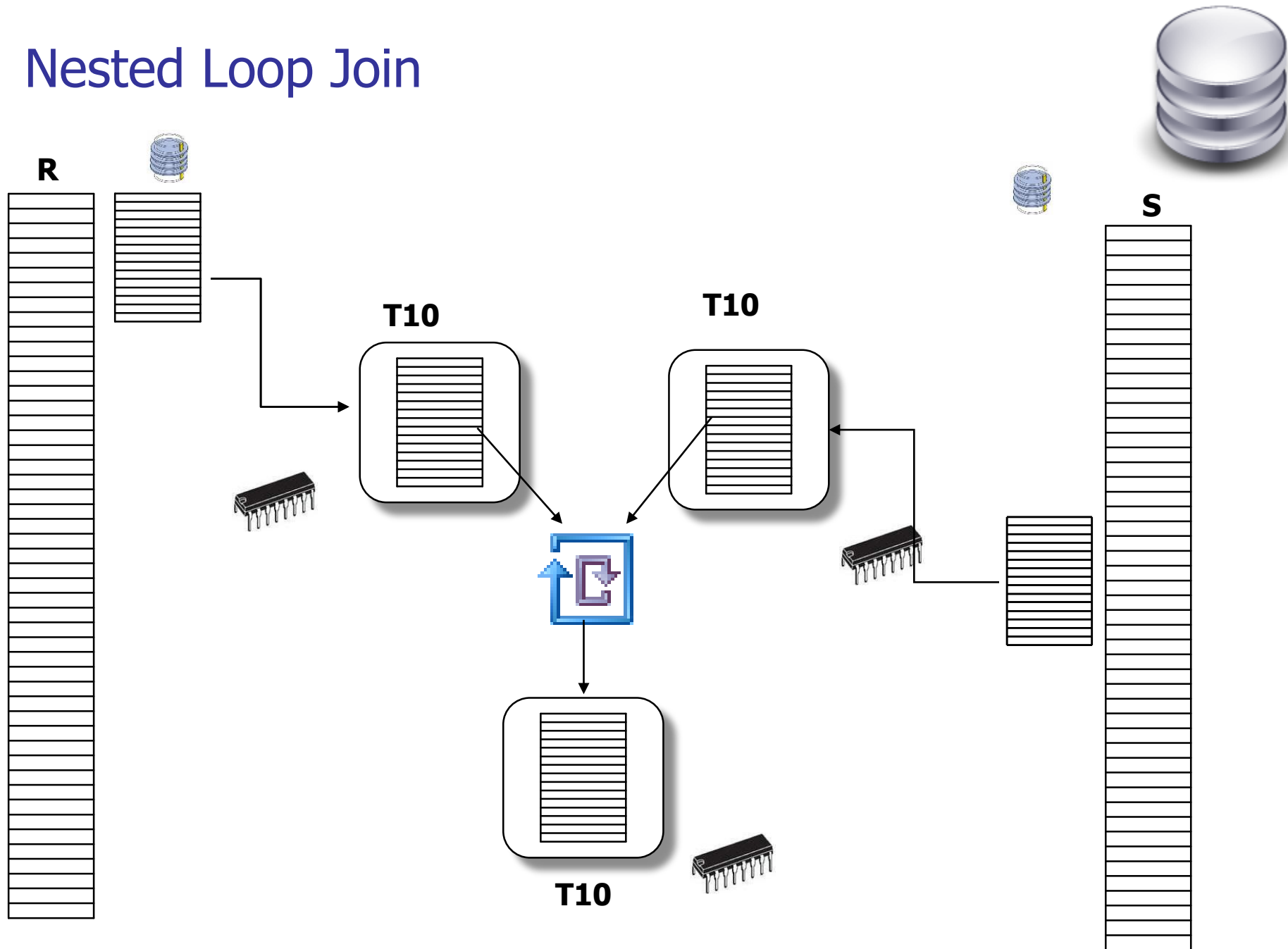
Nested Loop Join



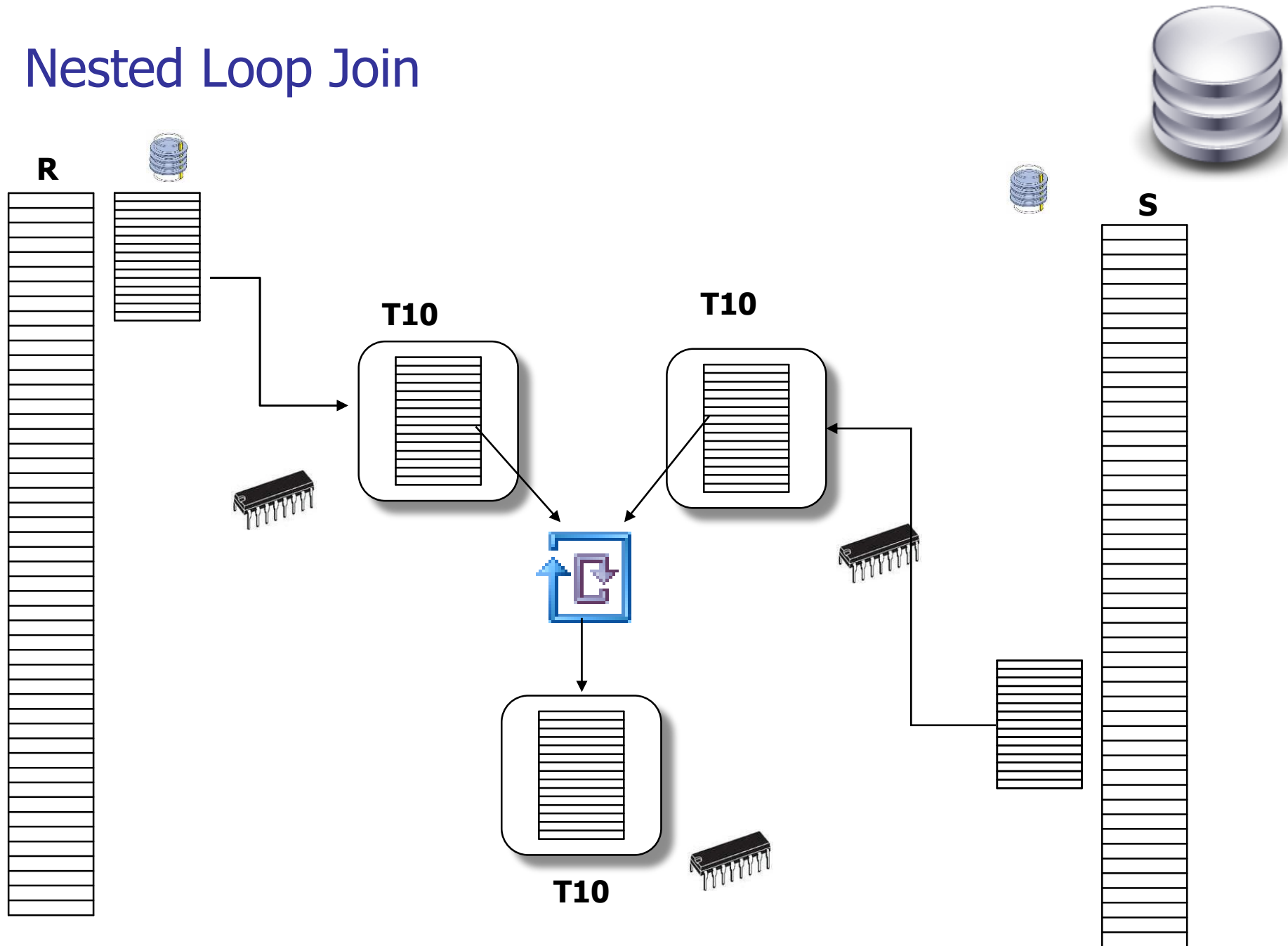
Nested Loop Join



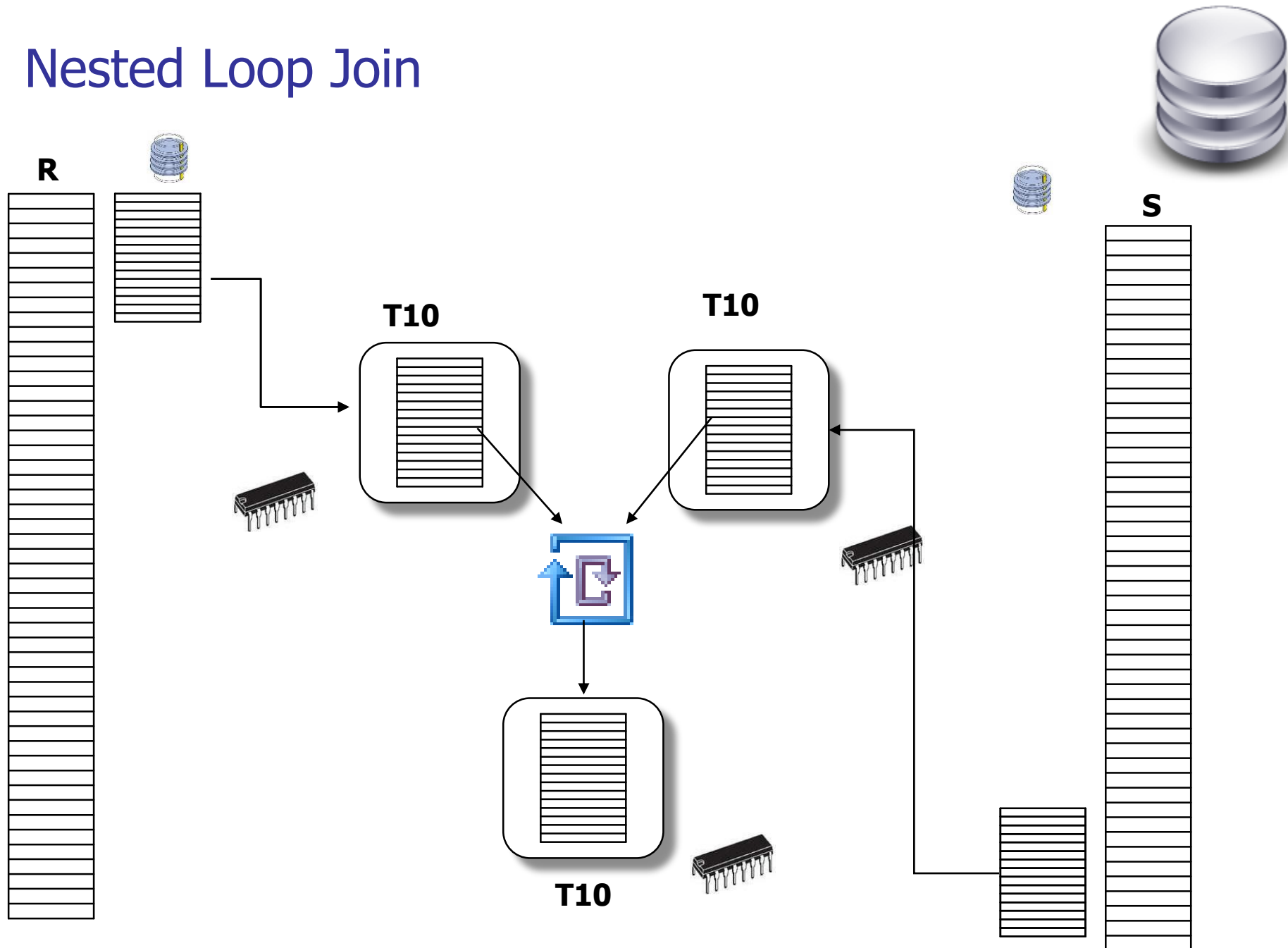
Nested Loop Join



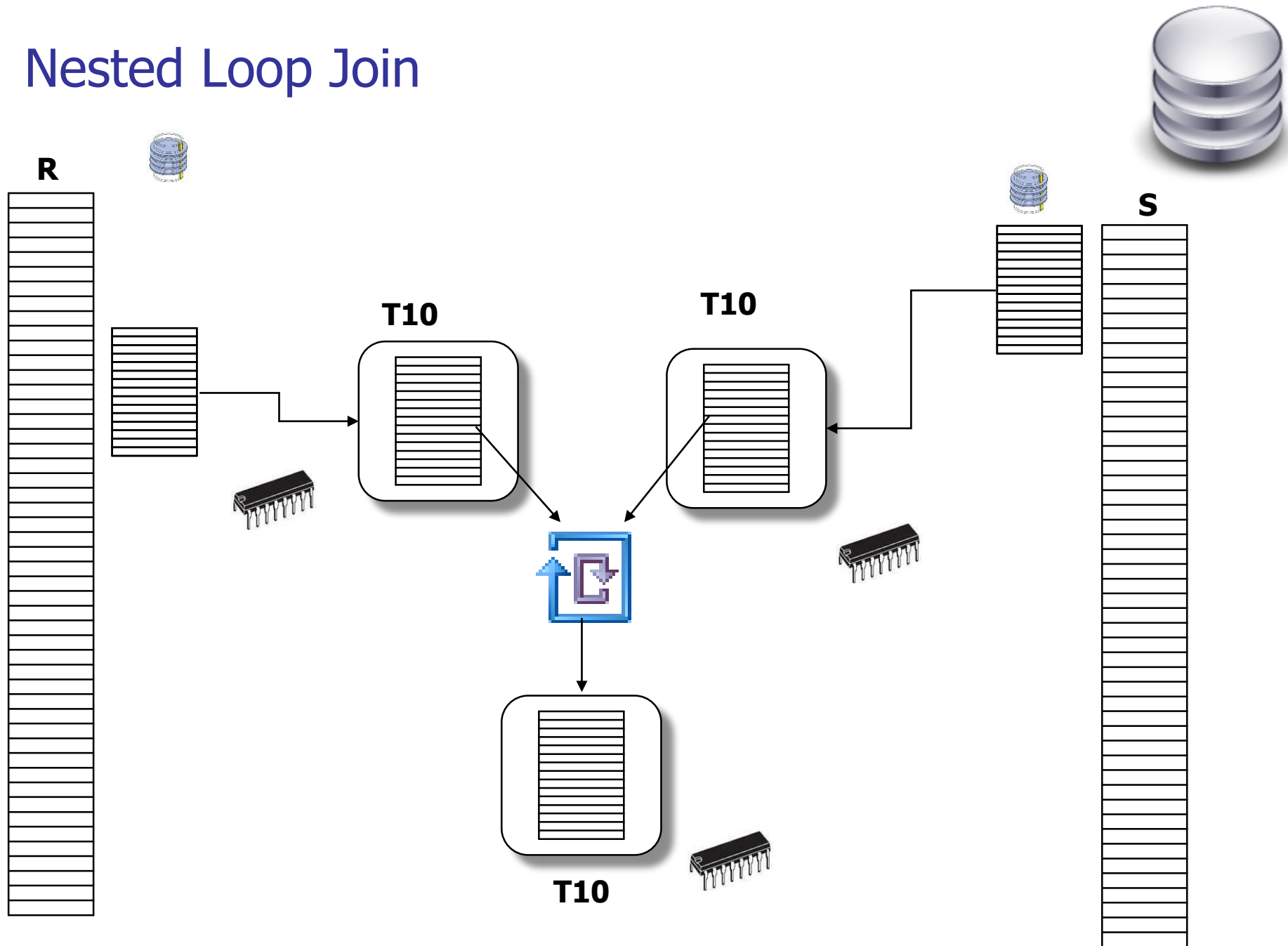
Nested Loop Join



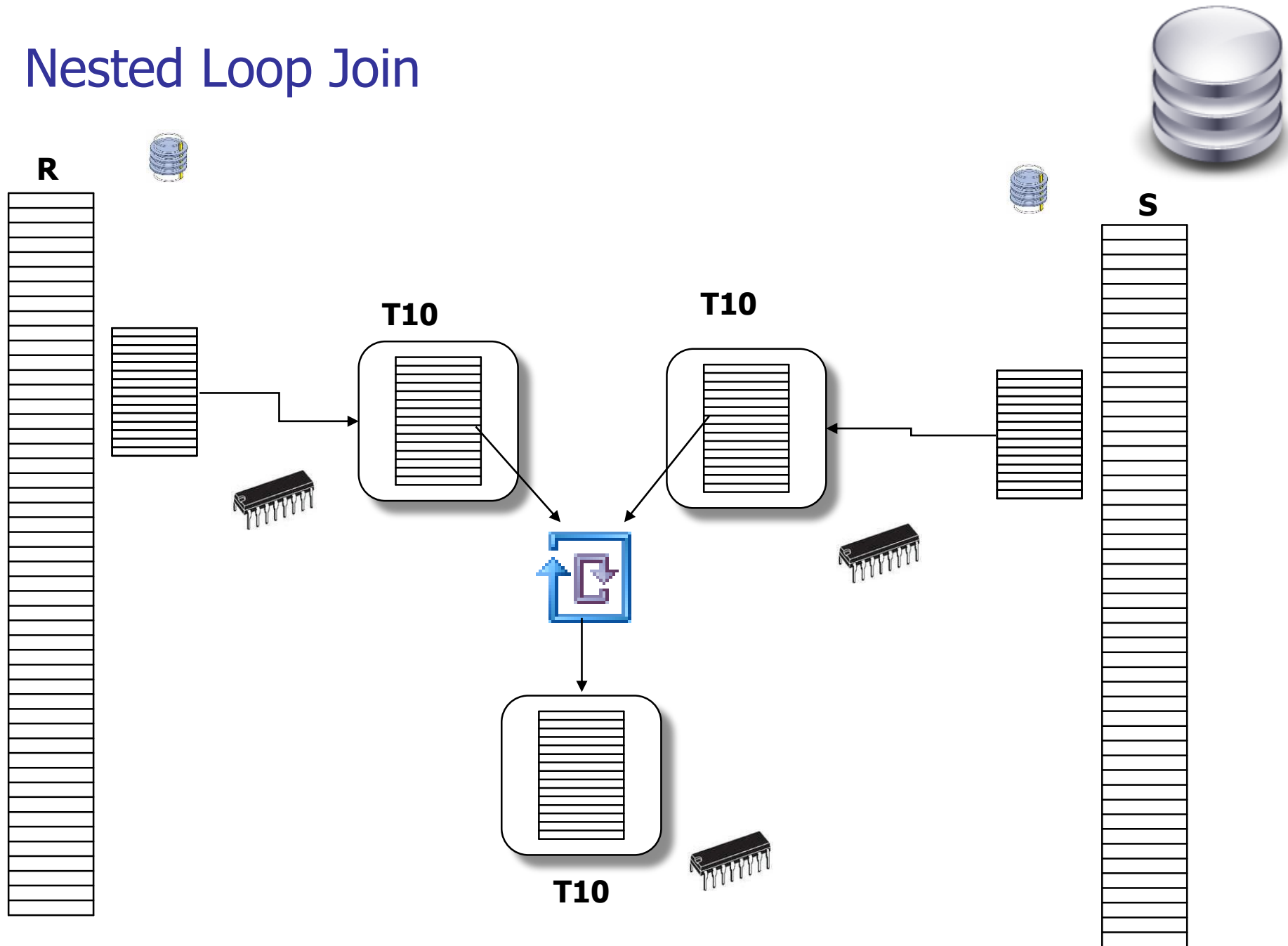
Nested Loop Join



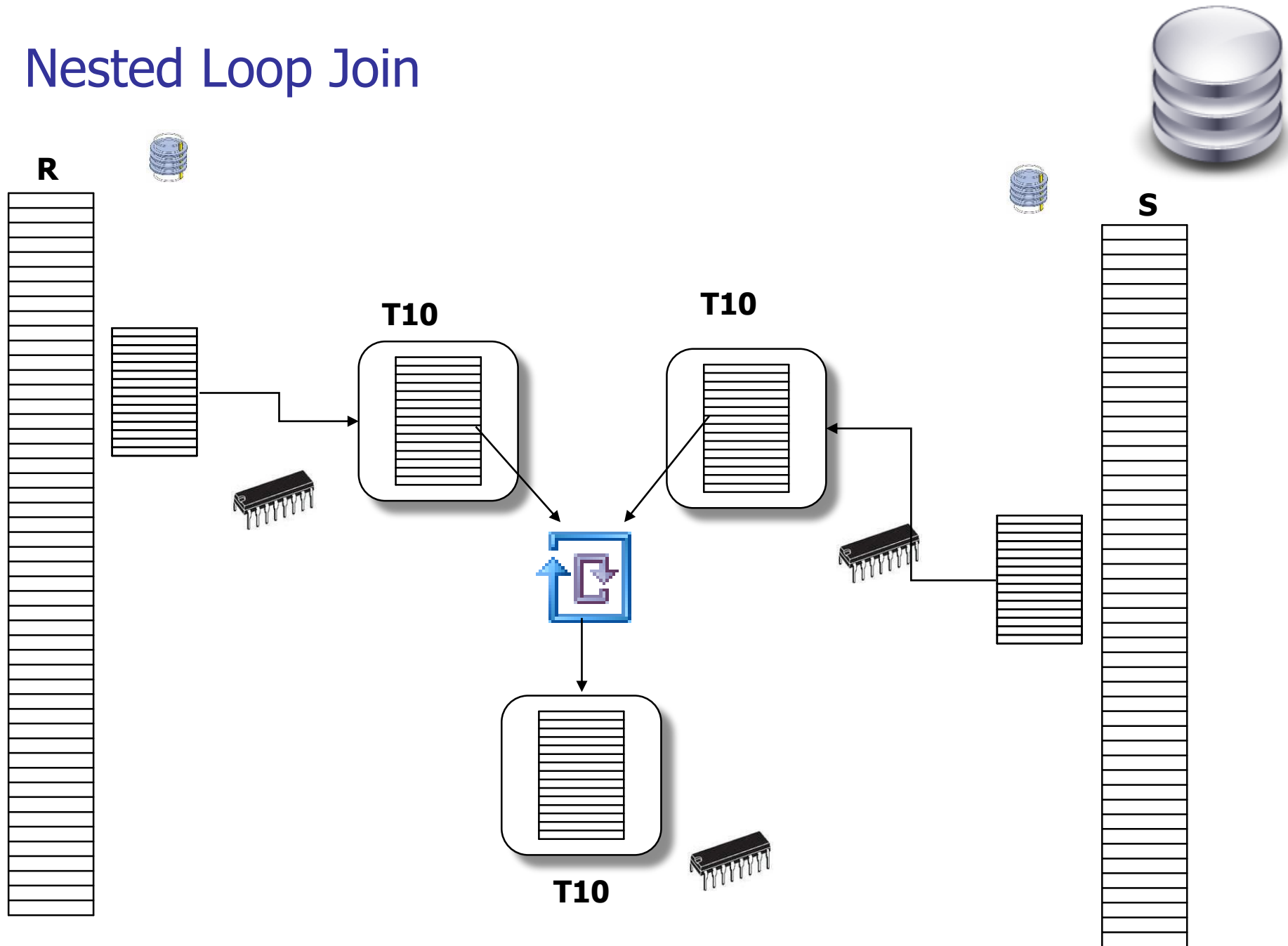
Nested Loop Join



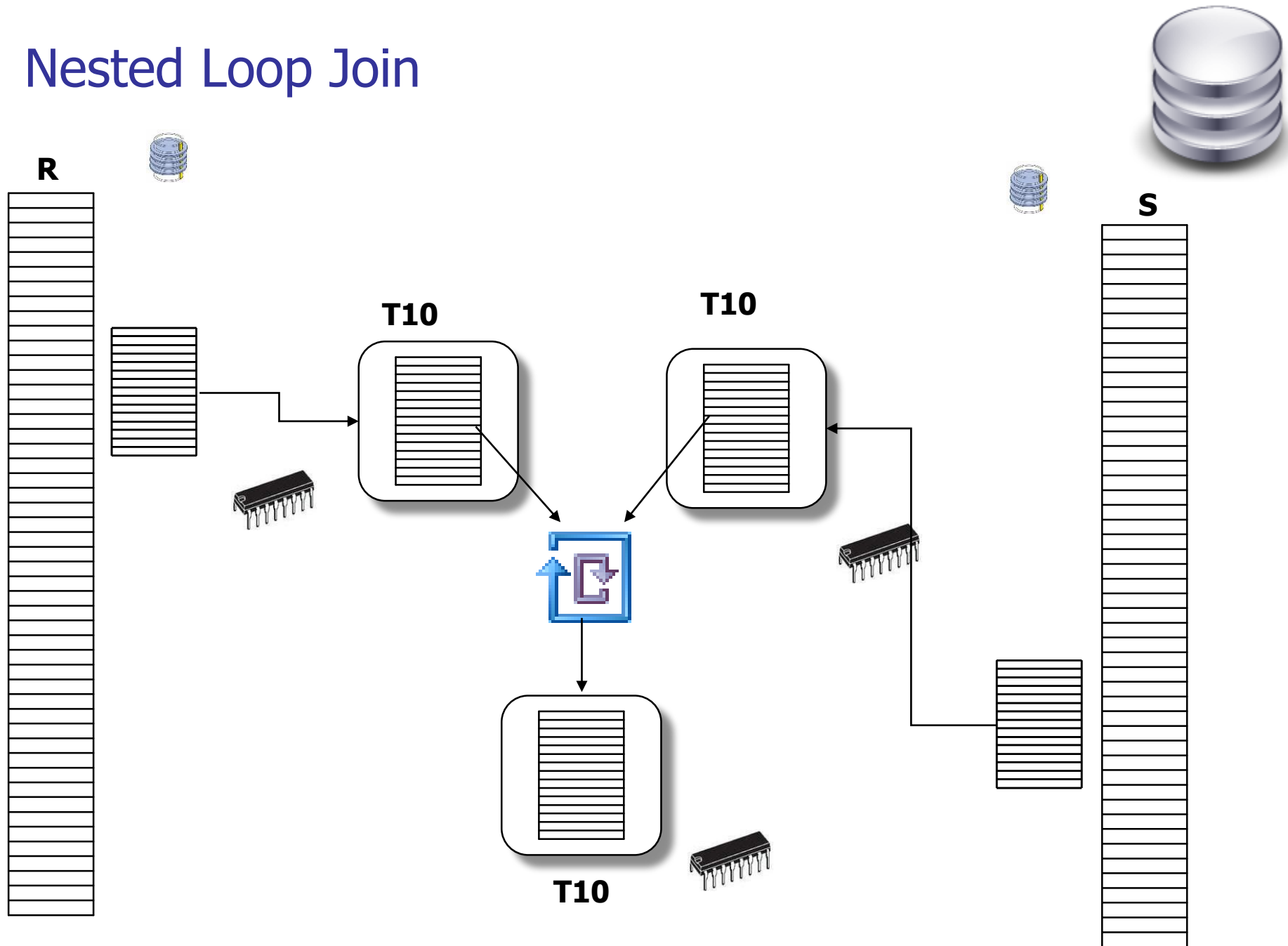
Nested Loop Join



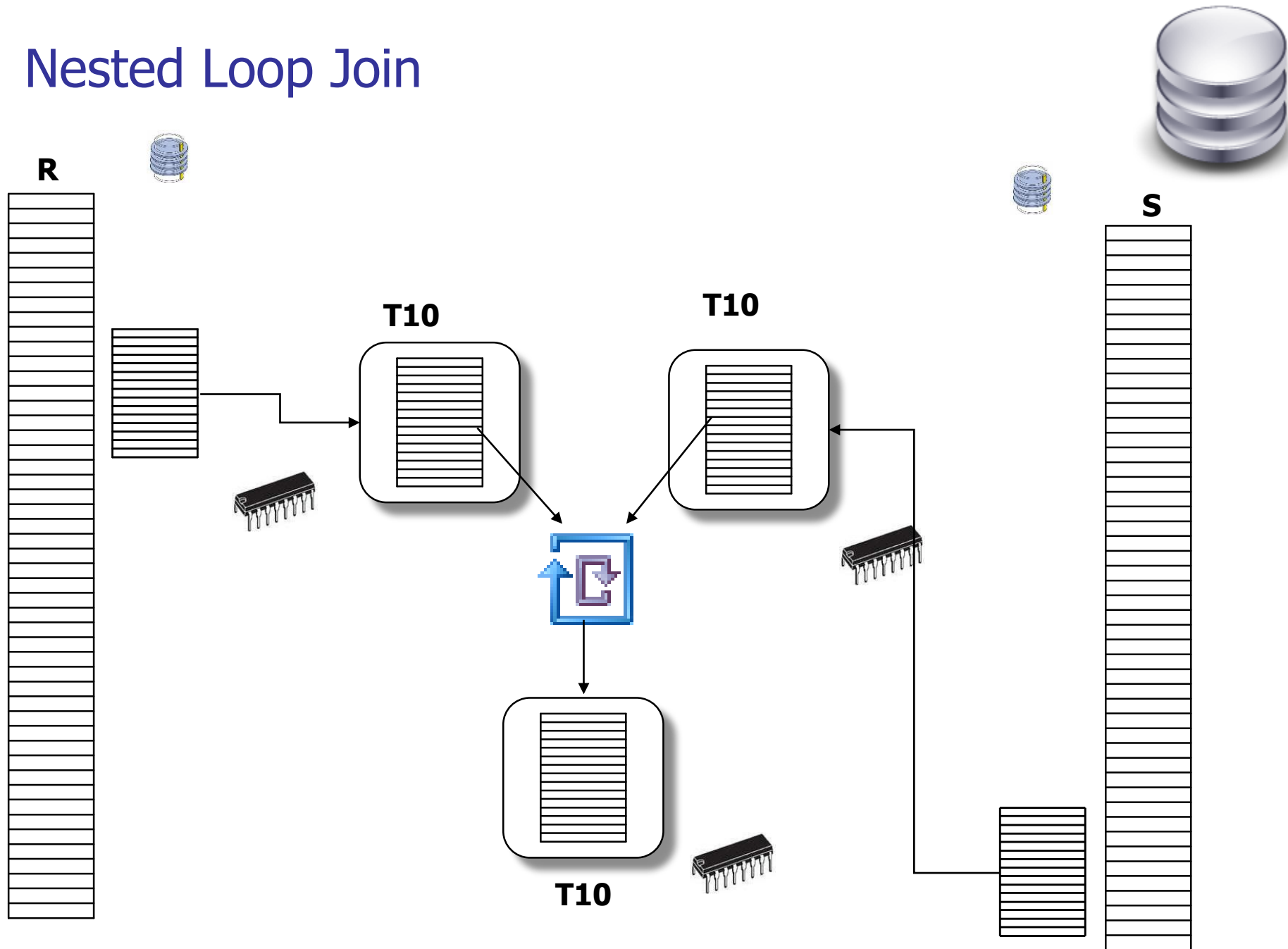
Nested Loop Join



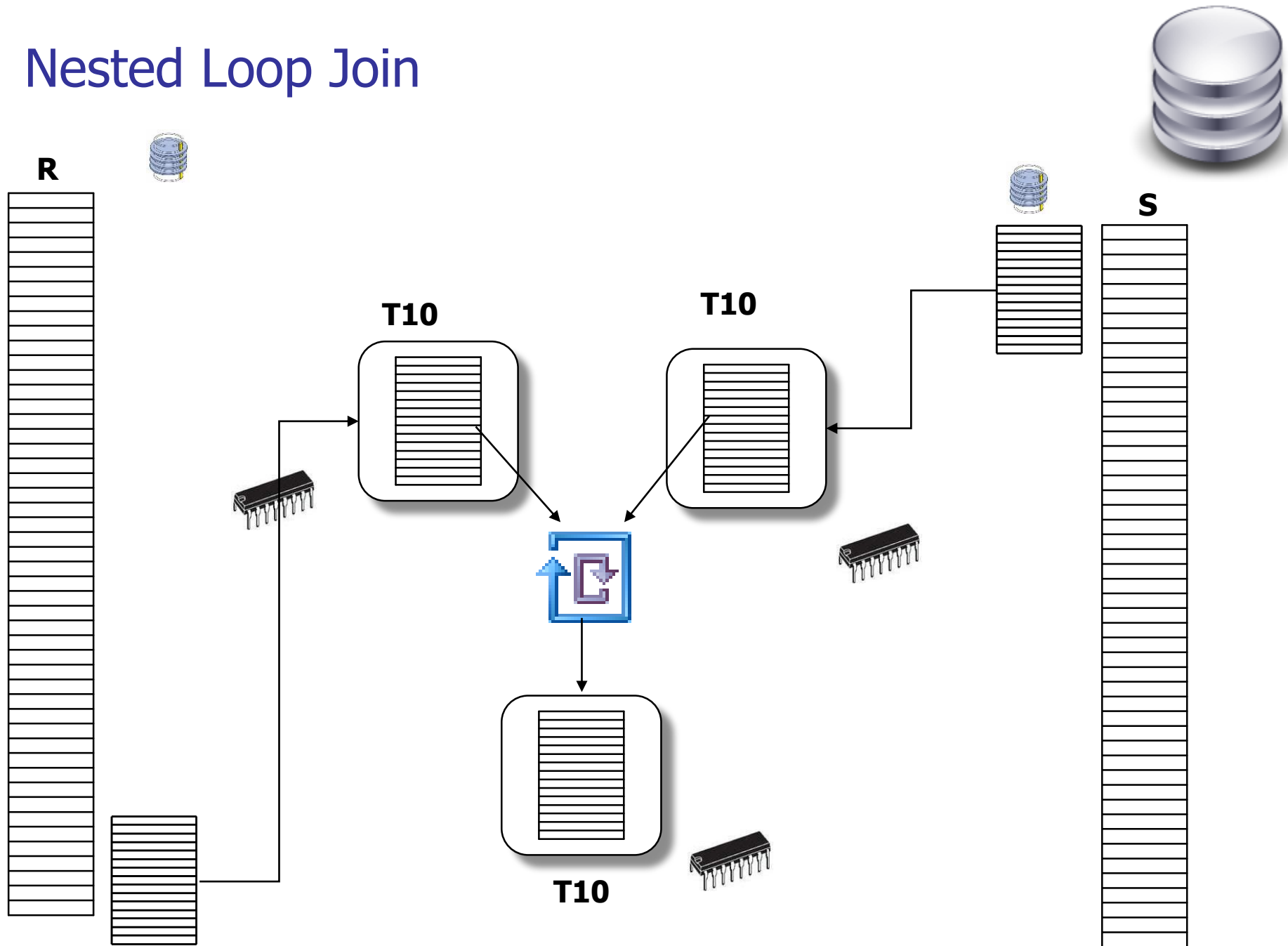
Nested Loop Join



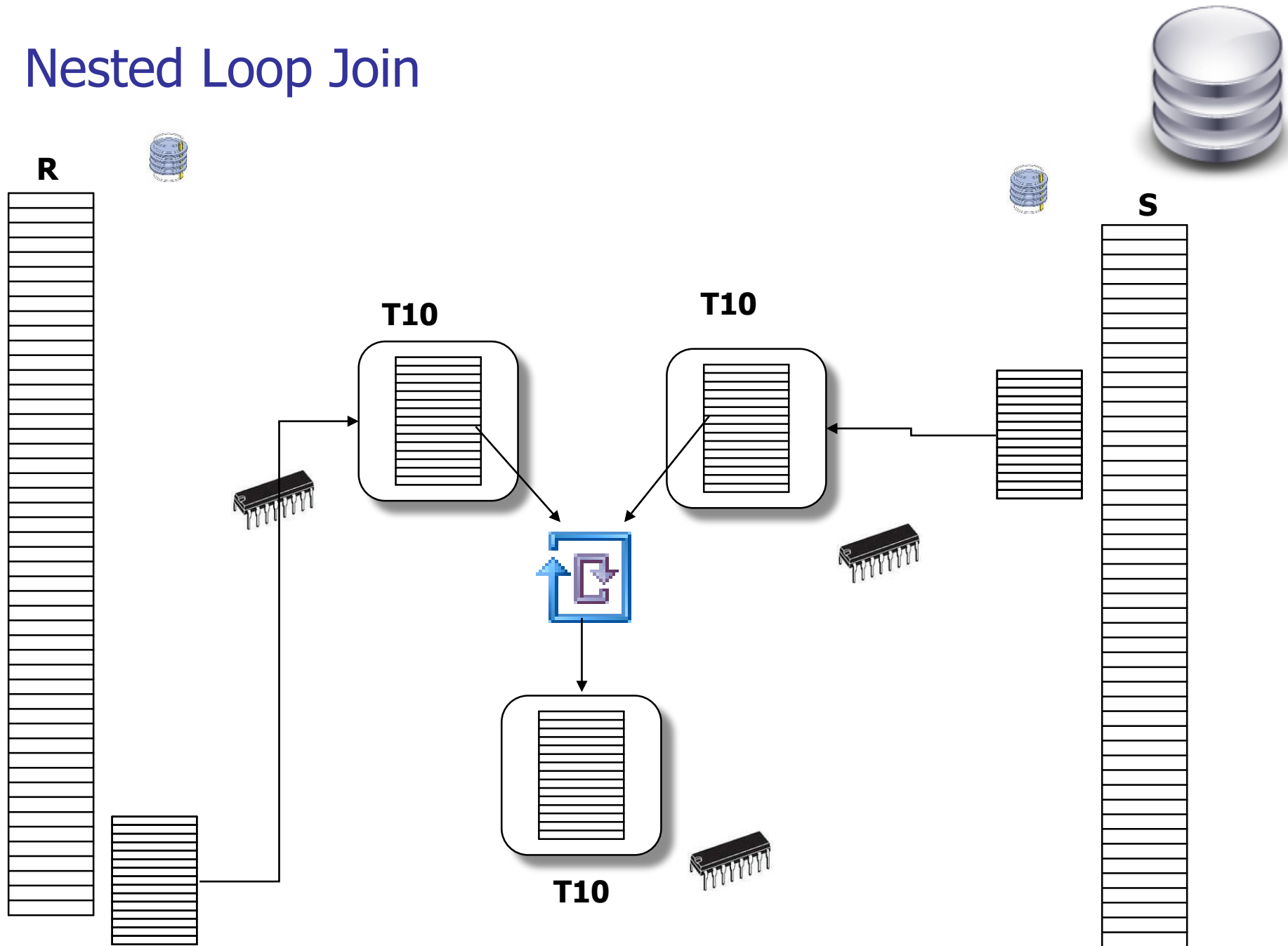
Nested Loop Join



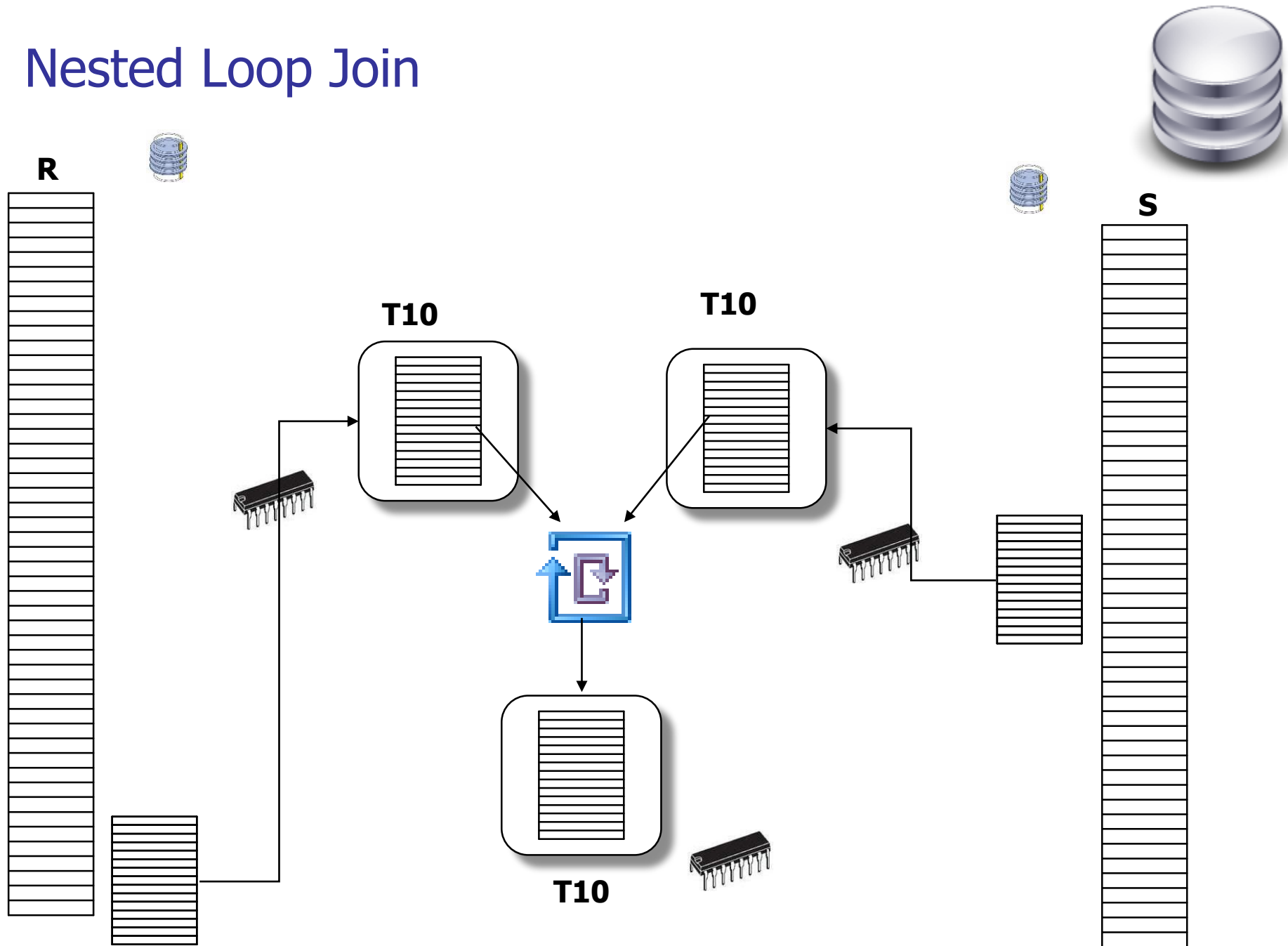
Nested Loop Join



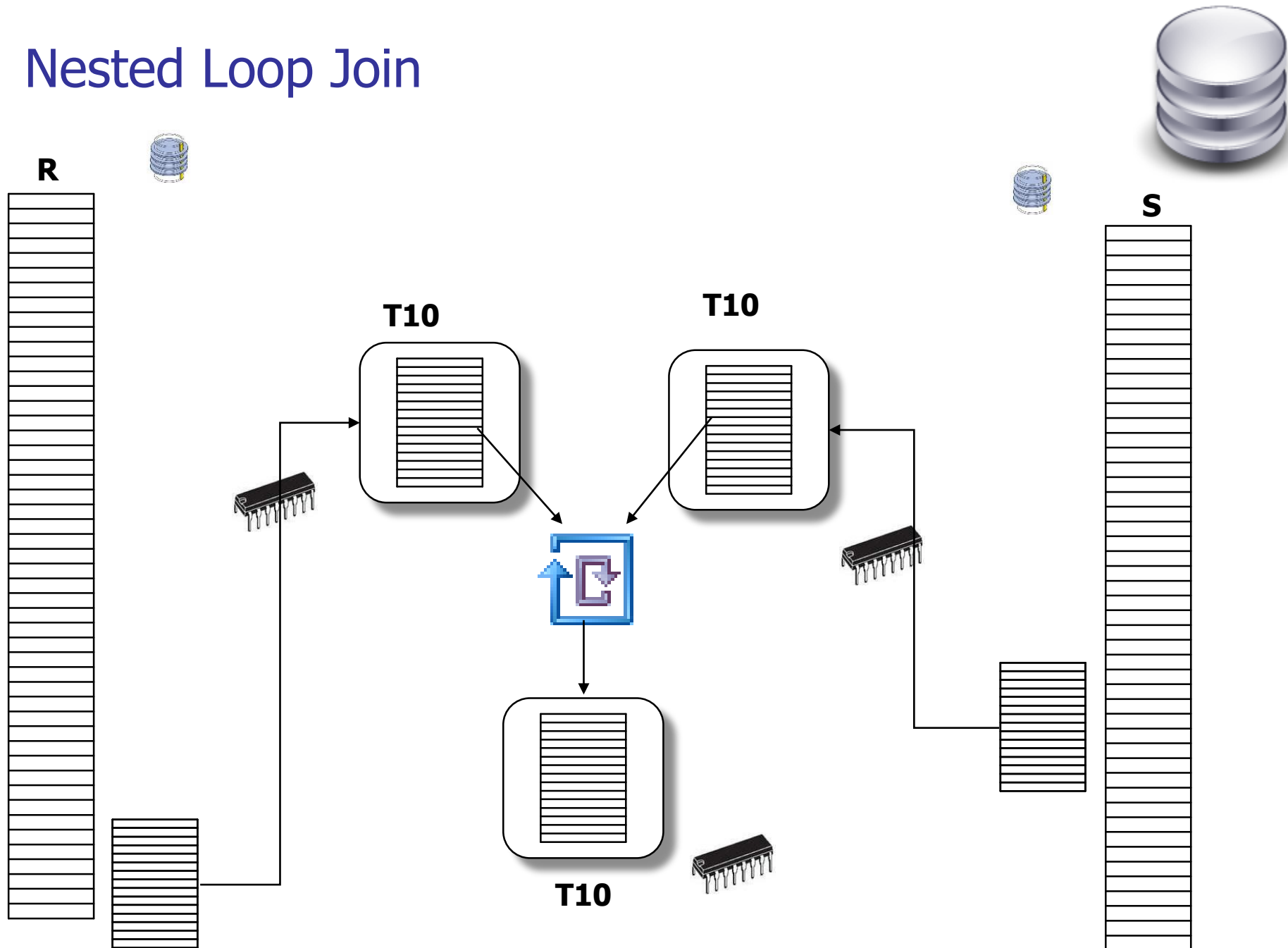
Nested Loop Join



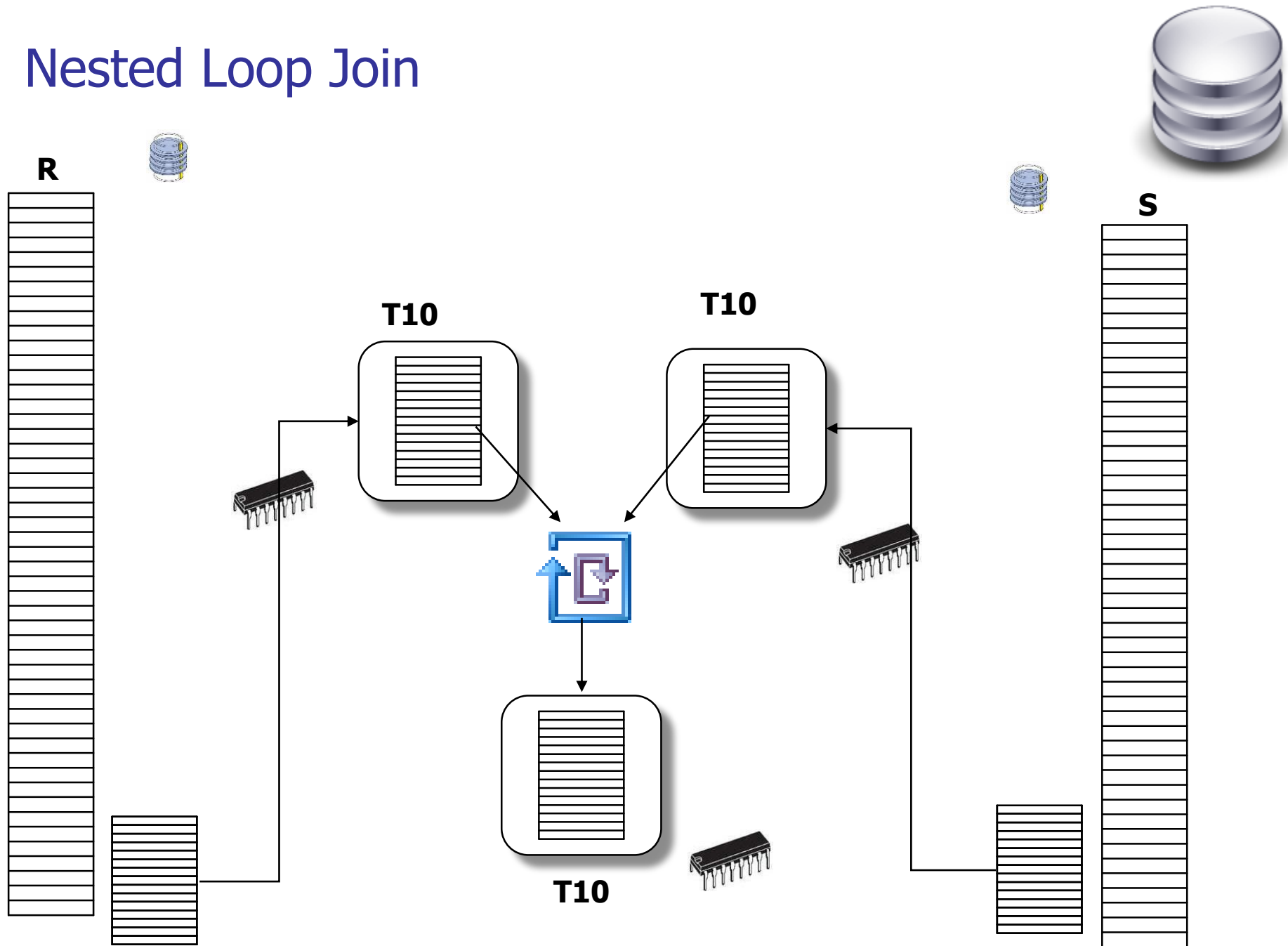
Nested Loop Join



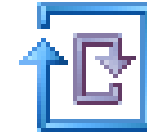
Nested Loop Join



Nested Loop Join



Coût de « external nested loop »



■ Nombre de lectures disques

- Nombre de blocks de R * Nombre de blocks de S.
- BR : Nombre de blocks de R
- BS : Nombre de blocks de S
- ?

