

PROGRAMMING CONCEPTS AND
EMBEDDED PROGRAMMING IN
C, C++ and JAVA:
Lesson-5: Tables

Table

- A two-dimensional array (matrix)
- An important data set that is allocated a memory block.
- Always a base pointer for a table.
- Base pointer points to its first element at the first column first row.
- Two indices, one for a column and other for a row.

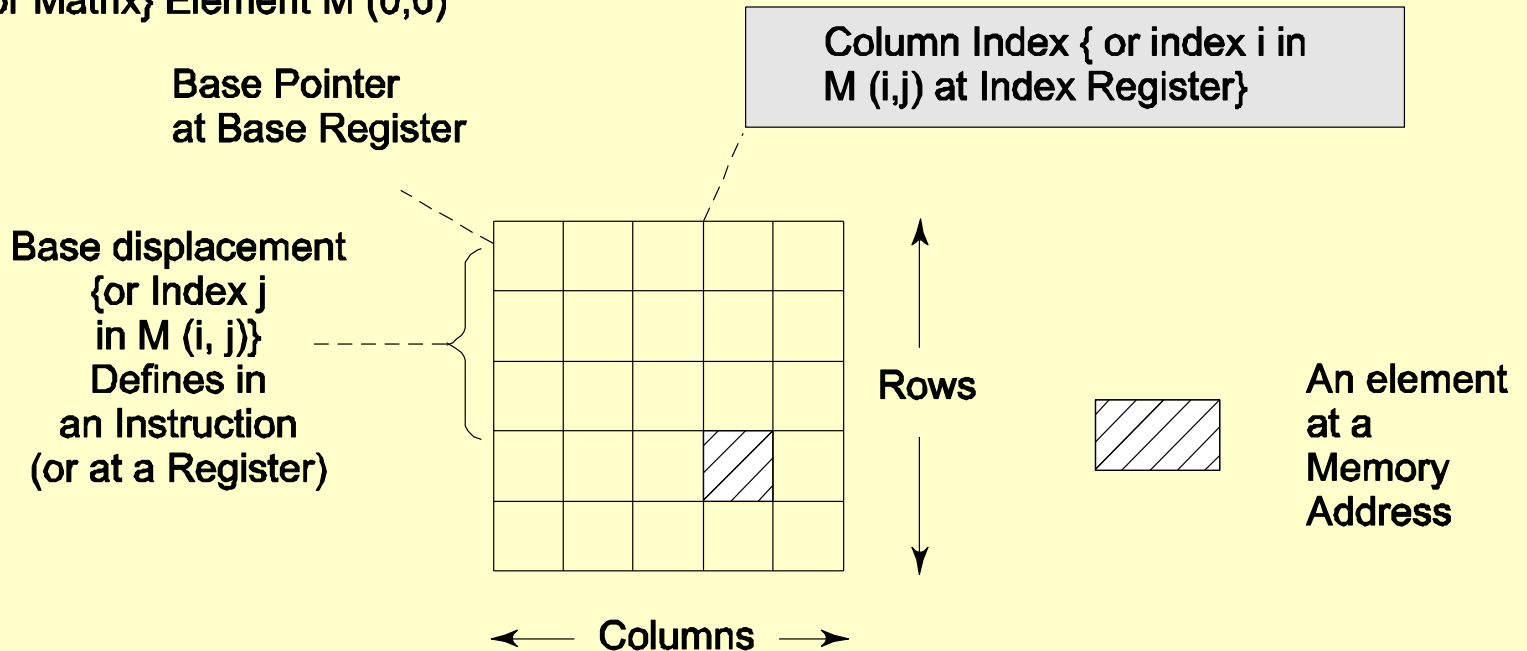
Three pointers in table

- Three pointers used
- Table base
- Column index and
- destination index
- Retrieve any element of the table

Table

A Memory Block Extends from Base Pointer onwards

Table { or Matrix } Element $M(0,0)$



Look up Table

- An important data set
- A lookup *table* – a two-dimensional array (matrix)

Look up Table

- First column hold the pointers— one pointer in each row and second column the values pointed by first column in each row.
- First and second columns at different non-adjacent addresses.
- Each row pointer in first column and from pointed memory block the addressed data traced

Column of the pointers in lookup table

- Column index pointers can retrieve any row element in the table

Hash Table

- A data set that is a collection of pairs of a key and a corresponding value.
- A hash table has a key or name in one column. The corresponding value or object is at the second column.

Hash Table

- The keys may be at non-consecutive memory addresses.
- When look-up tables store like a hash. If the first column of a table is used as a key (pointer to the value) and the second column as a value, we call that table as look-up table.

Hash Table

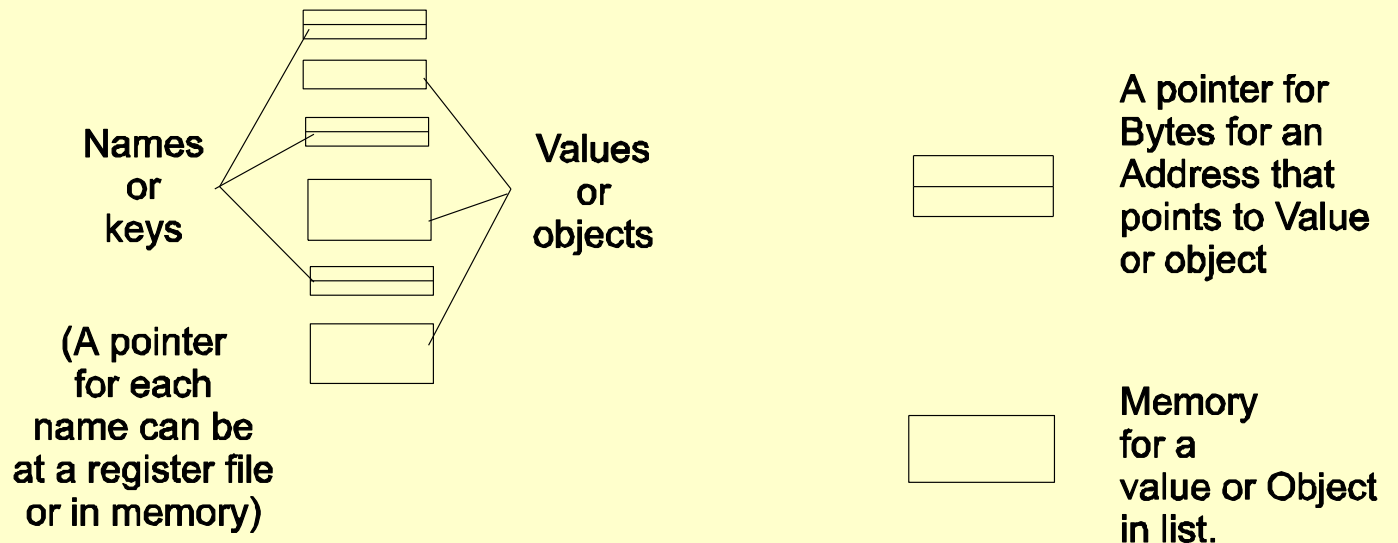
- A *has table* is a two-dimensional array (matrix) with first column can be said to hold key and second column the values
- An important data set.
- Each row has key and from look at the key, the addressed data in second column is traced
- Just as an index identifies an array element, a hash-key identifies a hash element

Column of keys in hash table

- By matching a key in a column of keys the values are retrieved from second column of the table

Hash Table

Name	Marks



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Summary

We learnt

- A table is a data set allocated with a memory block. Three pointers, table base, column index and destination index pointers can retrieve any element of the table

We learnt

- A hash table is a data set allocated with a memory block for key and value pairs. Just as an index number identifies an array element, a hash-key identifies a hash element. Hash table has a column of keys
- A look up table has a column of pointers

End of Lesson 5 of Chapter 7
on
Tables