Capgemini

ABAP Part I

Lesson 06: Internal Tables - I

Lesson Objectives

After completing this lesson, participants will be able to know:

- To Define an Internal Table and understand its attributes
- Types of Internal Tables
- To Add, Read, Update and Delete Data from an internal Table
- To Sort the Contents of an Internal Table

Internal Tables

Internal table provides a means of taking data from a fixed structure and storing it in working memory in ABAP

An internal table is a data object that contain any rows with any data type.

Internal Tables fulfill the function of Arrays

A very important use of internal tables is for storing and formatting data from a database table within a program.

Work Area In Internal tables

Work areas are single rows of data.

They should have the same format as any of the internal tables.

It is used to process the data in an internal table one line at a time.

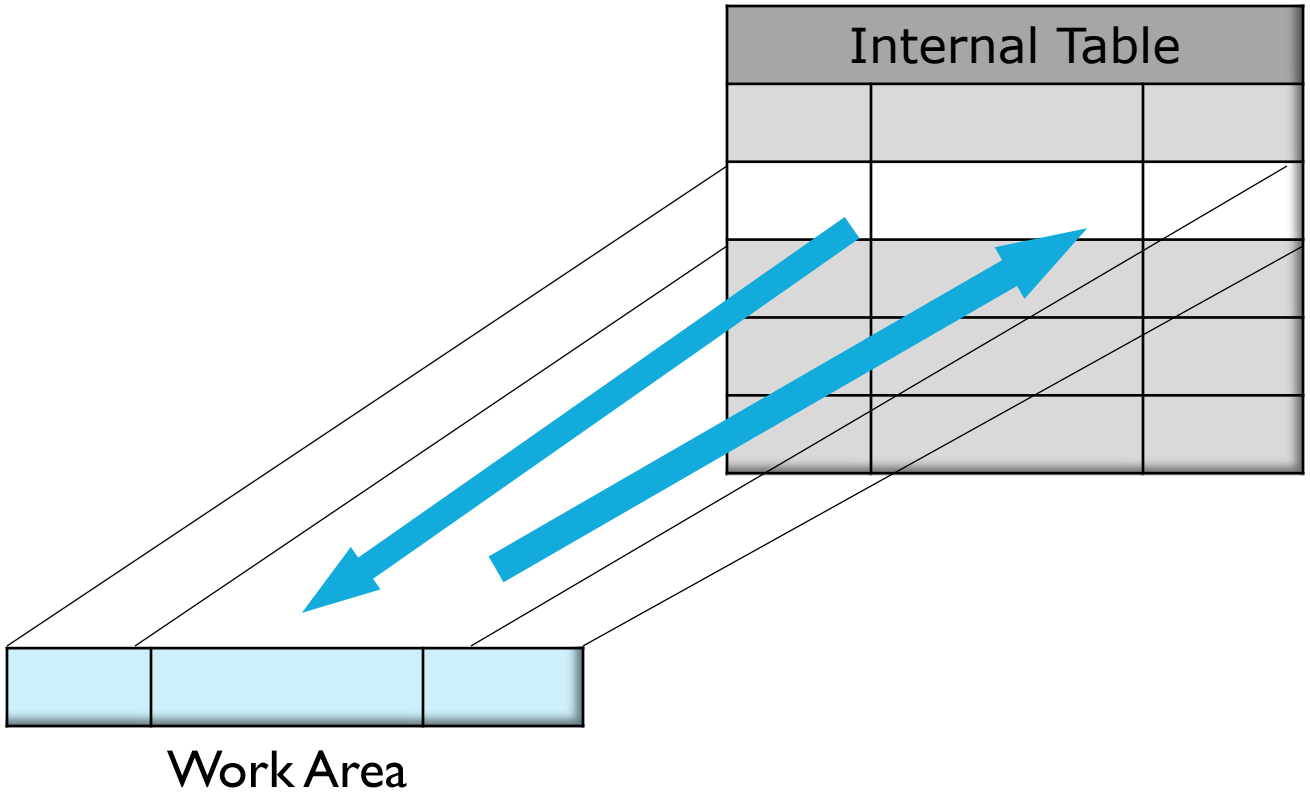
Access Methods to Individual Table Entries

There are two ways to access the individual rows of an Internal Table

- Accessing the Internal Table Rows Using a Work Area
  - The data in the table is not directly accessed but through another Data Object referred as a Work Area
  - Work Area must be compatible with the line type of internal table
  - When a data is read from the table, the data overwrites the current contents of the Work Area
  - When data is written to the Internal Table, it must be placed in the Work Area and then transferred to the Internal Table

- If the internal table has a Header Line, the Header Line can act as a Work Area.

Access Using a Work Area



Internal Tables with Header Line and Without Header Line

Internal tables can be created:

- Without Header Lines
- With Header Lines

When using internal tables with header lines, the header line and the body of the table have the same name.

If there is an internal table with header line, to address the body of the table, place brackets after the table name (<itab>[]).

If not, ABAP interprets the name as the name of the header line and not of the body of the table.

It is possible to avoid this potential confusion by using internal tables without header lines.

Internal Tables without Header Line

- Work area is to be explicitly specified when we need to access such tables.
- Hence these tables cannot be accessed directly.

Internal Tables without Header Line - Example

```
REPORT Z.
DATA ITAB TYPE TABLE OF I. "without header line
DATA WA TYPE I.  "work area
WA = 10.
APPEND WA TO ITAB.
WA = 20.
APPEND WA TO ITAB.
WA = 30.
APPEND WA TO ITAB.
WA = 40.
APPEND WA TO ITAB.
WA = 50.
APPEND WA TO ITAB.

LOOP AT ITAB INTO WA.
  WRITE:/ WA.
ENDLOOP.
```

Demo

Program on Internal table without header line

Internal Tables with Header Line

- Here the system automatically creates the work area.
- When using internal tables with header lines, the header line and the body of the table have the same name.
- The work area has the same data type as internal table.
- This work area is called the HEADER line.
- It is here that all the changes or any of the action on the contents of the table are done.
- As a result of this, records can be directly inserted into the table or accessed from the internal table directly

Internal Tables with Header Line - Example

```
REPORT Z.
ITAB = 10. "Header line
APPEND ITAB TO ITAB. "APPEND HEADERLINE TO INTERNAL TABLE
ITAB = 20.
APPEND ITAB. "Implies APPEND ITAB TO ITAB
ITAB = 30.
APPEND ITAB.
ITAB = 40.
APPEND ITAB.
ITAB = 50.
APPEND ITAB.

LOOP AT ITAB. "IMPLIES LOOP AT ITAB INTO ITAB
  WRITE ITAB.
ENDLOOP.
```

Demo

Program on Internal table with header line

Internal Tables Data Type

The data type of an Internal table is

- A table type defined in ABAP Dictionary OR Using Types or Data is specified fully using:
  - Row Type
  - Table Category
  - Table key

Internal Tables Data Type

Row Type: The row type of an internal table can be any data type. If the row type is structured, the individual components of a row are also known as the columns of the internal table.

Table Category: The table category defines how an internal table is administered and how its individual rows can be accessed. There are three table categories:

- Standard
- Sorted
- Hashed

Standard Table

Have an internal linear index

Records are accessed by index or keys

The response time for key access is proportional to number of entries

The key is always non-unique

Processing Statements for Internal Tables

The following can be used to Read records from an Internal table:

- Loop AT
- Read Table

Processing Statements for Internal Tables: Loop AT

The Syntax is:

```
LOOP AT itab result [cond].
  ...
ENDLOOP.
```

Where Result is

... { INTO wa }

Cond is:

... [FROM idx1] [TO idx2]
[WHERE log_exp|(cond_syntax)] ..

Demo

Read an Internal table using Loop at Statement

Processing Statements for Internal Tables: Read Table

The Syntax is:

```
READ TABLE itab { table_key
                | free_key
                | index } result.
```

Processing Statements for Internal Tables: Read Table - Index

READ TABL itab Index idx

- If the addition **INDEX** is used, the statement **READ** reads the row of the row number specified in **idx**

Demo

Read an Internal table using Index

Summary

In this lesson, you have learnt:

- To Define an Internal Table and understand its attributes
- Types of Internal Tables
- To Add, Read, Update and Delete Data from an internal Table
- To Sort the Contents of an Internal Table

Review Question

Question 1: _____ is a field string with the same structure as a row of the body, but it can hold a single row.

Question 2: _____ adds a single row to an internal