

# **IMS DB ONLINE TRAINING – DAY 2**

# TYPES OF PROCESSING

IMS DB can be used both in

- Online Processing (IMS DC and CICS Environment)
- Batch Processing (TSO)

*in Programs that runs as either MPP, BMP or DLI processing.*

- **ONLINE PROCESSING**

- MPP (Message Processing Program)
- BMP (Batch Message Processing)

- **BATCH PROCESSING**

- DLI (Data Language Interface)
- BMP (Batch Message Processing)

# IMS Terminologies

## SEGMENT (or) SEGMENT TYPE

- A Segment is a smallest block of information that DL/I can access in the database
- It's unit of data that DL/I transfers to and from a program in an I/O operation
- It is nothing but a group (or) mini-record with few or more fields (or) data elements

## SEGMENT OCCURENCE

- This is actual data in a Segment type

# IMS Terminologies

## Root Segment

The segment type at the top of the hierarchy on which all other segments are dependent on

## Dependent Segment

All of the segments in a database record other than root segment.

## Parent Segment

A Segment which has a dependant segment. Each segment that has one or more dependent segments.

Child Segment - Each dependent segment.

## Twin Segment

Two or more occurrences of the same segment type of same segment type

# IMS Terminologies

## Database Record

- Each occurrence of the root segment plus all the segment occurrences that are subordinate/child to it.

## Hierarchical Path

- Series of segments that lead from the top of a database down to any specific segment occurrence.

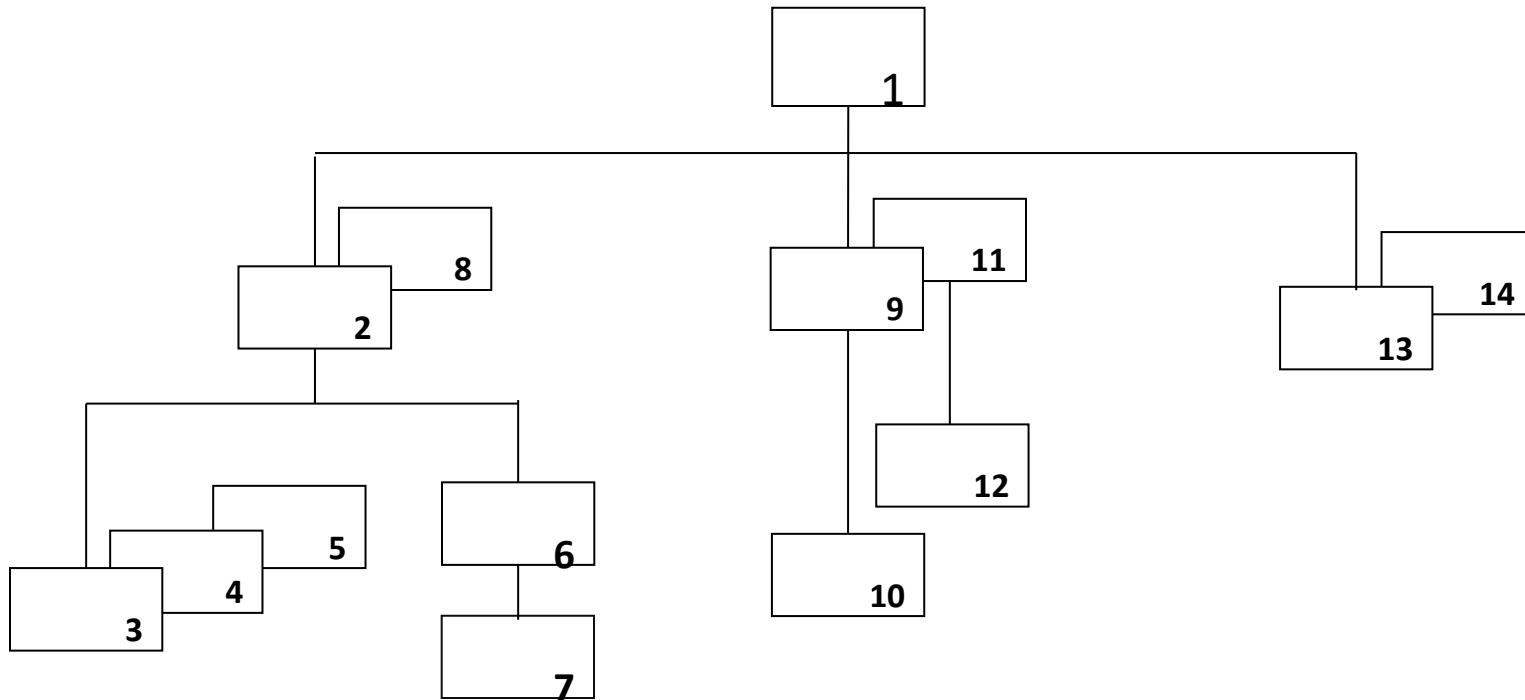
## Field

- Field is the smallest unit of information in the database. Each segment consists of one or more fields of information.
  - Key Field
  - Search Field

# IMS Database Rules

- No limit to the number of DB records
- Each record may contain any number of segments within (any number of child segment occurrences)
- There may be up to a maximum of 255 segments in a single database
- There is one root segment for a single database
- There may be any number of dependant segments for a parent
- A database record may have up to 15 hierarchical levels

# Exercise 2.1 (IMS DB Terminology)



- How many segment occurrences are there? -
- How many segment types are there? -
- How many data base records are there? -
- How many Root Segments are there? -
- How many Levels are there? -

# IMS DB Access Methods

## HSAM Databases (Hierarchical Sequential Access Method)

- Database records are stored consecutively
- Key is not mandatory
- Supports only Sequential Access
- It is used for low-use files like audit trails, statistical reports historical or archive data that has been purged from the main database

## HISAM (Hierarchical Indexed Sequential Access Method)

- Database records are stored consecutively. Key is mandatory.
- Supports both Sequential and Random Access
- Store in a KSDS (Primary Dataset) and a ESDS (Overflow Dataset)
- Used when most DB records are of same size. Deletion of DB records is minimal

# IMS DB Access Methods...continued

## HIDAM (Hierarchical Indexed Direct Access Method)

- Direct methods of storing data. Positions are fixed and pointers are used.
- Deleted spaces can be reused
- Store in a KSDS (Primary Dataset) and a ESDS (Overflow Dataset)

## GSAM Databases (Generalised Sequential Access Method)

- PS or VSAM (ESDS) can be used with GSAM in Batch processing only
- GSAM is useful if you need an application program that accesses MVS data sets to use the IMS symbolic checkpoint call
- GSAM databases are loaded in the order in which you present records to the load program.
- You cannot issue DLET and REPL calls against GSAM databases; however, you can issue ISRT calls after the database is loaded but only to add records to the end of the data set. Records cannot be randomly added to a GSAM data set.

# IMS DB Access Methods...continued

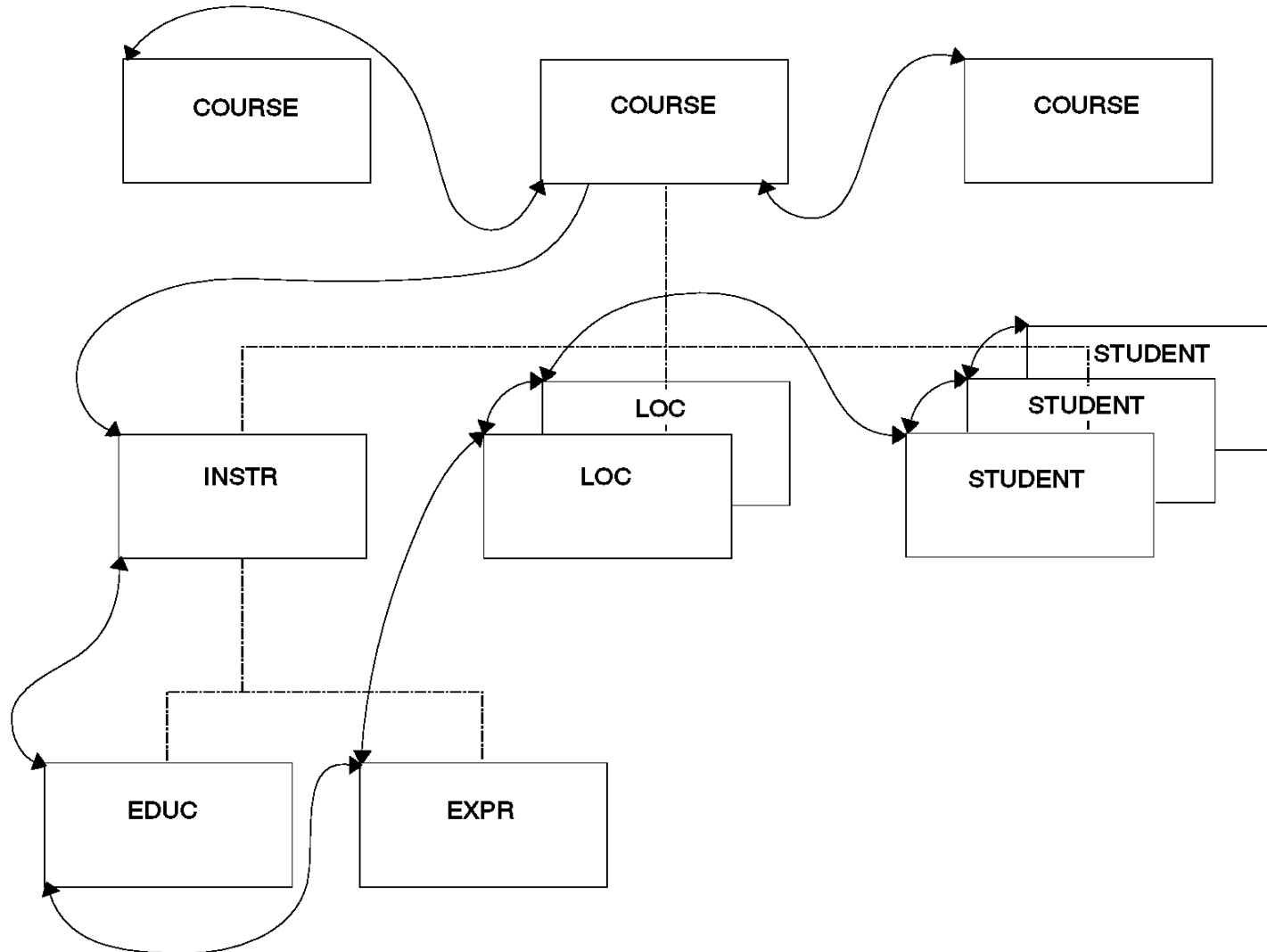
## HDAM (Hierarchical Direct Access Method)

- Direct methods of storing data. Positions are fixed and pointers are used.
- Deleted spaces can be reused, Stored in an ESDS
- In HDAM, each root segment's storage location is found using a randomizing module. The randomizing module examines the root's key and, through an arithmetic technique, computes the address of a pointer to the root segment( In terms of CI and Root Anchor Point).
- The advantage of the HDAM randomizing module is that the I/O operations required to search an index are eliminated. In addition, no need exists to update an index after a root segment is inserted or deleted.
- The disadvantage of HDAM is that root segments cannot be accessed in key sequence

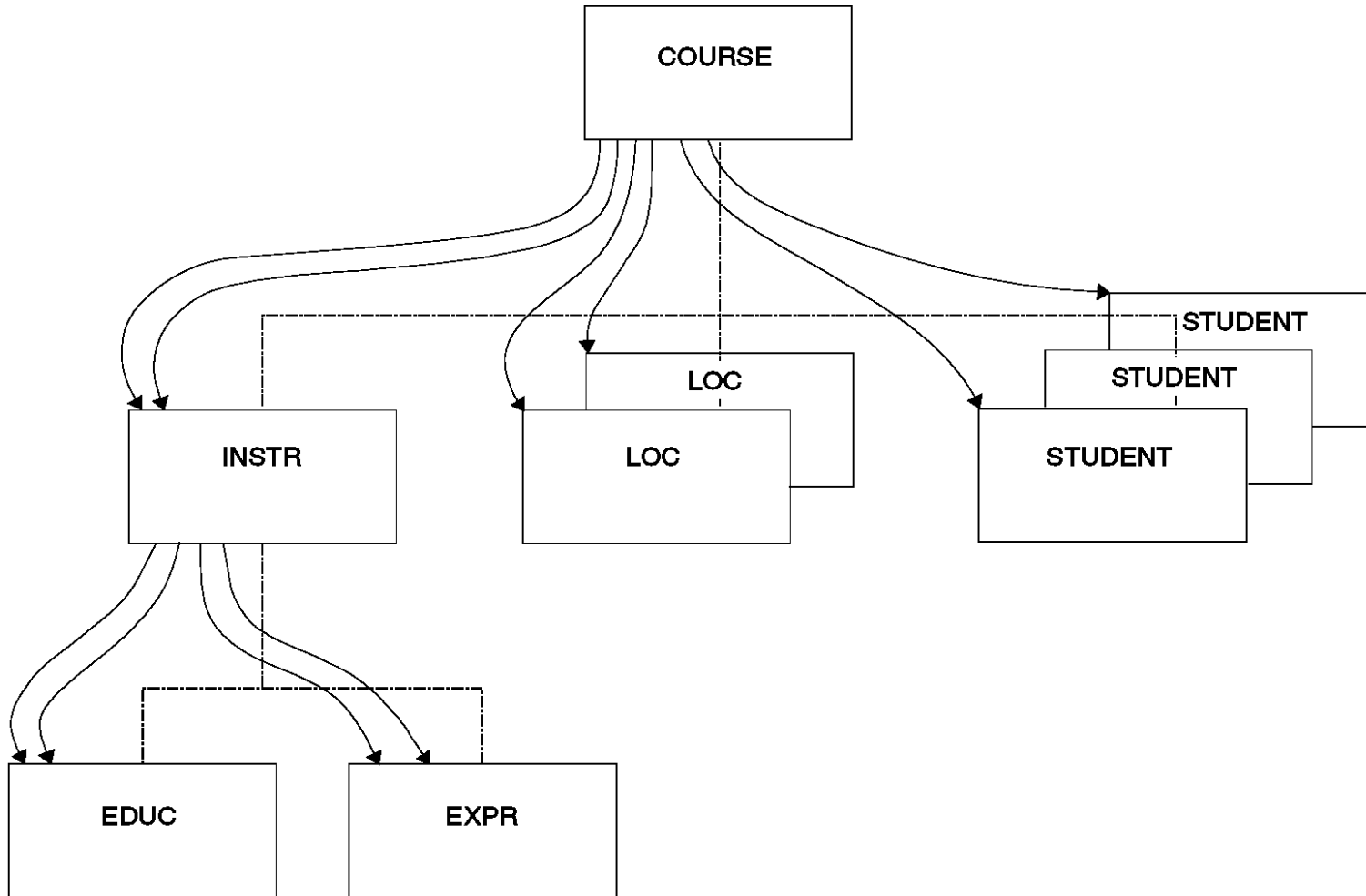
# IMS DB Pointers

- *Hierarchic Forward Pointers*
- *Hierarchic Forward and Backward Pointers*
- *Physical Child First Pointers*
- *Physical Child First and Last Pointers*
- *Physical Twin Forward Pointers*
- *Physical Twin Forward and Backward Pointers*

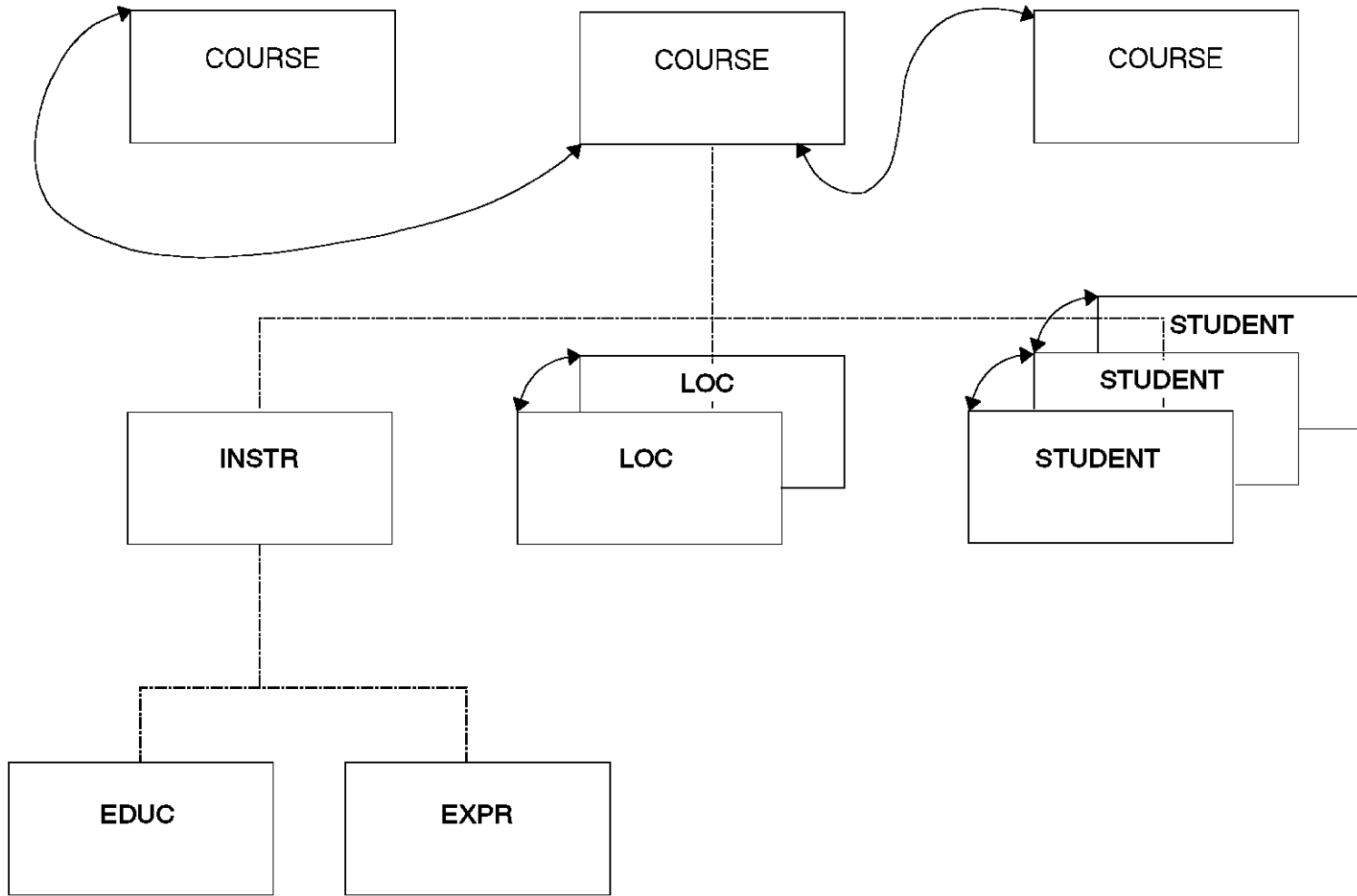
# Hierarchic Forward and Backward Pointers



# Physical Child First and Last Pointers



# Physical Twin Forward and Backward Pointers



## Exercise 2.2 (Test your Knowledge)

- 1) How do you know the structure of a IMS DB?
- 2) Can we have 256 Segments in a IMS DB?
- 3) Is IMS DB faster than DB2? If so, why?
- 4) What does a DBD contain?
- 5) How many primary keys a DBD will contain?
- 6) In which segment a primary key is defined?
- 7) Can we have more than one root segment occurrence in a IMS DB?
- 8) What do you mean by a Search field in a DBD?
- 9) Do you require to define all the fields of an IMS DB SEGMENT in DBD?
- 10) Who is going to create the DBD?

# End of Day 2