

# OPERATING SYSTEM

## Overlay in Operating Systems

### Definition

**Overlay** is a memory management technique used to run programs that are larger than the available physical memory by loading only the required parts of the program into memory at a time.

Unused parts are kept on disk and loaded only when needed.

### Why Overlay is Needed

Early systems had:

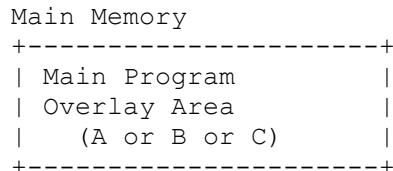
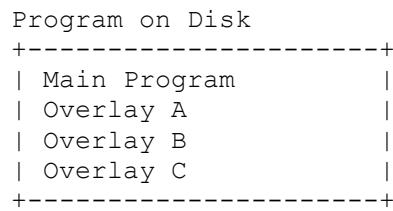
- Very limited main memory
- Large programs that could not fit entirely into RAM

👉 Overlay allows such programs to execute without increasing memory size.

### Basic Idea

- A program is divided into **modules**
- Only **one module** (overlay) is loaded into memory at a time
- When another module is needed, it **replaces the current one**

### Overlay Diagram



Only **one overlay** is present in memory at any time.

### How Overlay Works

- Main program is loaded into memory

- Required overlay is loaded into the overlay area
- When another overlay is needed:
  - Current overlay is removed
  - New overlay is loaded from disk
- Execution continues

## Advantages of Overlay

- Allows execution of **large programs** in small memory
- Efficient use of limited memory
- Reduces memory requirements

## Disadvantages of Overlay

- Programmer must manage overlays manually
- Complex program design
- Slower execution due to disk access
- Largely replaced by **virtual memory**

## Overlay vs Paging

Feature	Overlay	Paging
Loading	Manual	Automatic
Programmer Involvement	Required	Not required
Memory Management	Program-controlled	OS-controlled
Used In	Older systems	Modern systems

## Real-World Status

- Rarely used in modern OS
- Important **theoretical concept**
- Foundation idea behind **virtual memory**

**Overlay is a memory management technique where a program is divided into parts, and only the required part is loaded into memory at a time, allowing execution of programs larger than physical memory.**