What is bootstrap program in OS?

Bootstrap program is a initial program that runs when a computer system is powered on or restarted. It is responsible for initializing the system hardware, loading the operating system into memory, and starting its execution.

Steps: -

1. **Power-on and system initialization:**
   When the computer is powered on, CPU looks for a firmware program (BIOS) stored in BIOS Chip. CPU runs the BIOS which tests and initializes system hardware. BIOS loads configuration settings. If something is not appropriate (like missing RAM) error is thrown and boot process is stopped. This is called POST (Power on self-test) process.

2. **Boot device selection:**
   After the initial hardware setup, the bootstrap program determines the boot device from which the operating system will be loaded. This can be the hard disk, SSD, a USB drive, a network server, or any other storage medium.

3. **Loading the operating system:**
   The bootstrap program reads the first sector of the boot device, known as Master Boot Record (MBR), into memory. This sector contains a small program

called the boot loader, which is responsible for loading the full operating system into memory.

4. **Handover to the operating system:**
   The boot loader program takes control, loads the necessary files and modules of the operating system into memory, and starts its execution. From this point onwards, the operating system takes over and continues the boot process, initializing various system services, launching user applications, and providing the user interface.

The bootstrap program plays a crucial role in the boot process of a computer system, enabling the loading and execution of the operating system.