



SWE4001 – System Programming

Module 4: Loader and Linkers

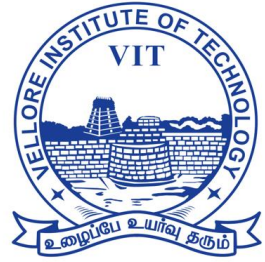
Lesson 5 of 6: Machine-Independent Loader Features

Machine Independent Loader Features



- Automatic Library Search
- Loader Options

Machine-Independent Loader Features

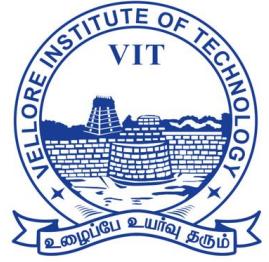


Automatic Library Search

❖ Many linking loaders

- Can automatically incorporate routines from a subprogram library into the program being loaded.
- Example: A standard system library
- The subroutines called by the program begin loaded are automatically fetched from the library, linked with the main program, and loaded.

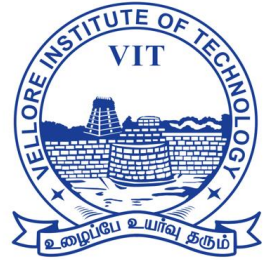
3.3.1 Automatic Library Search



❖ Automatic library call

- At the end of Pass 1, the symbols in ESTAB that remain undefined represent unresolved external references.
- The loader searches the library

Automatic Library Search



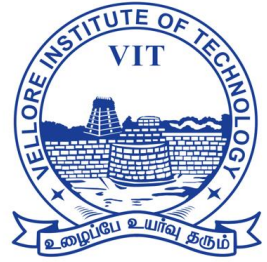
- The subroutines fetched from a library in this way may themselves contain external references. It is necessary to repeat the library search process until all references are resolved.
- If unresolved references remain after the library search is completed, they are treated as errors.
- If a symbol (or a subroutine name) is defined both in the source program and in the library, the one in the source program is used first.



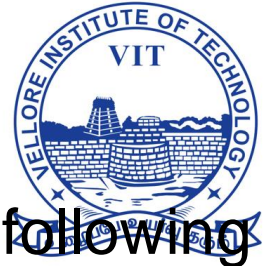
Loader Options

- Allow the user to specify options that modify the standard processing by having
 - a special command language
 - A separate input file to the loader that contains control statements
 - Loader control statements in the source program itself, the assembler or compiler retains the commands as a part of the object program.

Commands used in command language



- **INCLUDE** program-name(Library-name)
 - Direct the loader to read the designated object program from a library and treat it as primary loader input.
- **DELETE** csect-name
 - Allows to delete external symbols or entire control sections.
- **CHANGE** name1,name2
 - Cause the external symbol name1 to change to name2 wherever it appears in the object program.



Commands used in command language

- To make the source program of COPY to use the following utility programs
- A sequence of loader commands used to make this change.
 - INCLUDE READ(UTLIB)
 - INCLUDE WRITE(UTLIB)
 - Direct loader to include control sections READ and WRITE from the library UTLIB
 - DELETE RDREC, WRREC
 - Delete the control sections RDREC and WRREC from load
 - CHANGE RDREC, READ
 - CHANGE WRREC, WRITE
 - CHANGE command cause all external reference to symbol RDREC to be changed to refer to SYMBOL READ