



MODULAR PROGRAMMING

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INTRODUCTION

- The formulation of complex programs from numerous small sequences, called program modules is modular programming.
- Each module performs a well-defined task.



DEVELOPING ASSEMBLY LANGUAGE PROGRAM

- Precisely stating what the program is to do.
- Breaking the overall problem into tasks.
- Defining exactly what each task must do and how it is to communicate with the other tasks.
- Putting the tasks into assembler language modules and connecting the modules together to form the program.
- Debugging and testing the program.
- Documenting the program.



MODULAR PROGRAMMING

The reasons for breaking a program into small parts are :

- Modules are easier to comprehend
- Different modules can be assigned to different programmers
- Debugging and testing can be done in amore orderly fashion.
- Documentation can be more easily understood.
- Modifications may be localized.
- Frequently used tasks can be programmed into modules that are stored in libraries and used by several programs.



LINKING AND RELOCATION

- Find the object modules to be linked
- Construct the load module by assigning the positions of all of the segments in all of the object modules being linked.
- Fill in all offsets that could not be determined by the assembler.
- Fill all segment addresses
- Load the program for execution.



NEED OF STACK

- There are many situations in which a program needs to temporarily store information and then retrieve it in reverse order.
- **Example:** Saving and restoring the counters when nesting loops.



PROCEDURES

- Set of code that can be branched to and returned from in such a way that the code is as if it were inserted at the point from which it is branched to.
- The branch to a procedure is referred to as call
- Corresponding branch back is return.



ADVANTAGES AND DISADVANTAGES OF PROCEDURES

- Advantages:
 - They save memory and programming time by allowing code to be reused and provide a modularity that makes it easier to debug and modify a program
- Disadvantages:
 - Linkage associated with them
 - Linkage program is more sometimes



MACROS

- Segment of code that needs to be written only once but whose basic structure can be caused to be repeated several times within a source module by placing a single statement at the point of each appearance.
- No linkage is required.

