DAYANANDA SAGAR COLLEGE OF ENGINEERING
COMPUTER SCIENCE & ENGINEERING

Minor Project- Report
April 2022-July 2022

Course Faculty: Dr. Vindhya M

Course Name & code:
System Software 19CS6DLSSL

Semester: 6

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TITLE OF THE PROJECT	LOADER IMPLEMENTATION			
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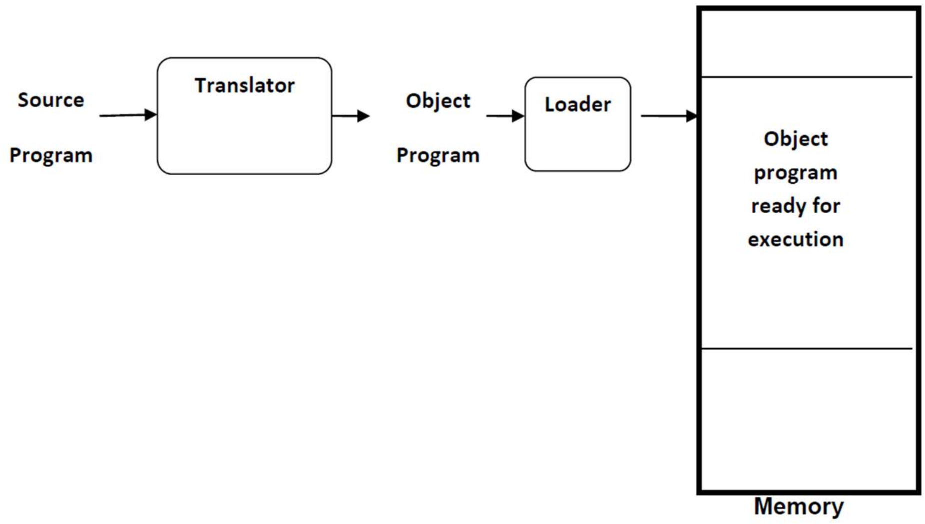
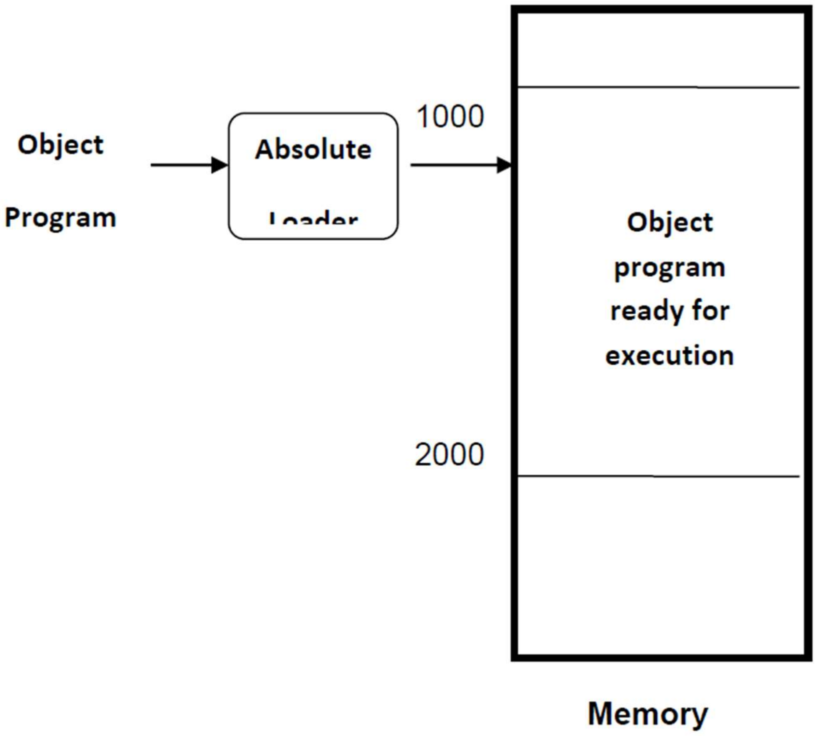
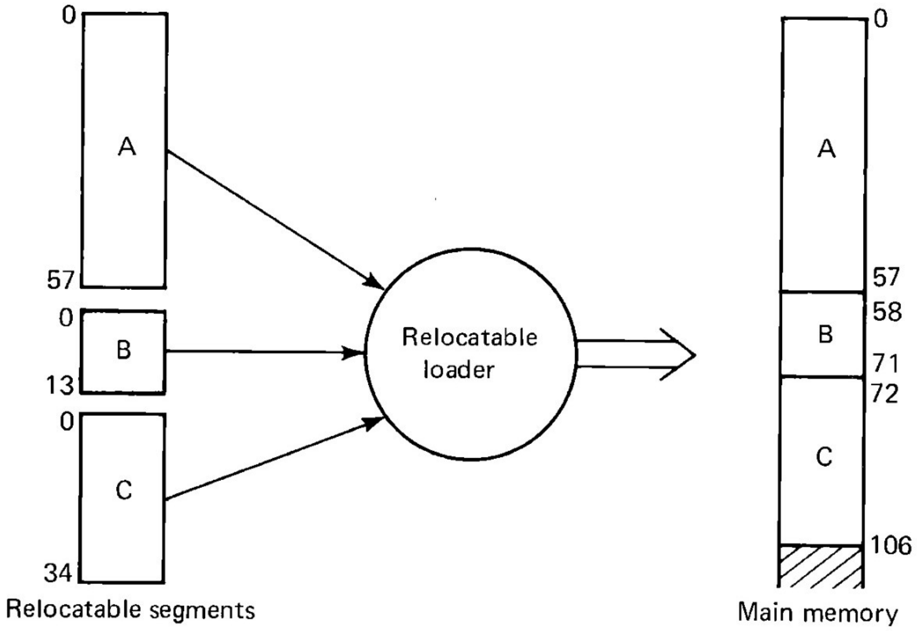
USN	1DS19CS009	1DS19CS010	1DS19CS011	1DS19CS012
INDIVIDUAL CONTRIBUTION	Relocation Loader implementation	Relocation Loader implementation	Absolute Loader implementation	Absolute Loader implementation
GUIDE	Dr. Vindhya M			
PROJECT ABSTRACT :	We have implemented the absolute and relocation loader in our project in C. The Algorithm for Absolute Loader: • Begin • Read Header record • Verify program name and length • Read first Text record • While record type is <> ‘E’ do • Begin • {If object code is in character form, convert into internal representation} • Move object code to specified location in memory • Read next object program record • End • Jump to address specified in End record • End			

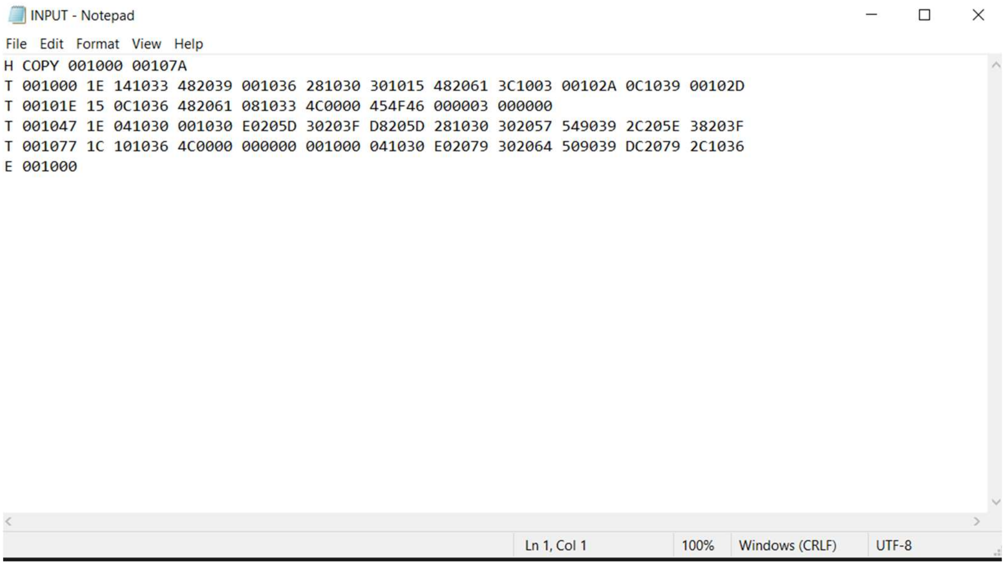
	The Relocating Loader works on the basis of a relocation bit which specifies if modification is needed. Relocation bit is 0: no modification is necessary, and is 1: modification is needed. The Algorithm for Relocating Loader: • Start the program execution. • Enter the starting address location for relocating the object code. • Transfer the input array into output array. • Convert the current string array into binary form, where current string is relocating bit. • Relocating bit is subjected to required changes before transferring input to output and also move object code • Stop the program execution.
PLATFORM USED (H/W & S/W TOOLS TO BE USED	A Windows system and C program is executed in CodeBlocks IDE.
INTRODUCTION	A loader is a system program that performs the loading function. It brings object program into memory and starts its execution. The different types of loaders are: • Absolute loader • Bootstrap loader • Relocating loader (Relative loader) • Direct linking loader The absolute loader is a kind of loader in which relocated object files are created, loader accepts these files and places them at a specified location in the memory. A bootstrap loader is the first code that is executed when the computer system is started. The entire operating system depends on the bootstrap loader to work correctly as it loads the operating system. Relocation Loader provides the efficient sharing of the machine with larger memory and when several independent programs are to be run together. It also supports the use of subroutine libraries efficiently.

DESIGN	Block Diagram for a Loader:  Source Program Translator Object Program Loader Object program ready for execution Memory Block Diagram for Absolute Loader:  Object Program Absolute Loader 1000 2000 Object program ready for execution Memory

	Block Diagram for Relocation Loader:  0 A 57 0 B 13 0 C 34 Relocatable segments Relocatable loader 0 A 57 58 B 71 72 C 106 Main memory
PROJECT SOURCE CODE LINK (GITHUB/ GOOGLE DRIVE)	https://github.com/adithya-n11/Loader-Implementation
CONCLUSION /FUTURE ENHANCEMENT	•A loader is a major component of an operating system that ensures all necessary programs and libraries are loaded, which is essential during the startup phase of running a program. •It places the libraries and programs into the main memory in order to prepare them for execution. •Loading involves reading the contents of the executable file that contains the instructions of the program and then doing other preparatory tasks that are required in order to prepare the executable for running, all of which takes anywhere from a few seconds to minutes depending on the size of the program that needs to run. The following are the responsibilities of a loader: •Validate the program for memory requirements, permissions, etc. •Copy necessary files, such as the program image or required libraries, from the disk into the memory •Copy required command-line arguments into the stack •Link the starting point of the program and link any other required library •Initialize the registers •Jump to the program starting point in memory

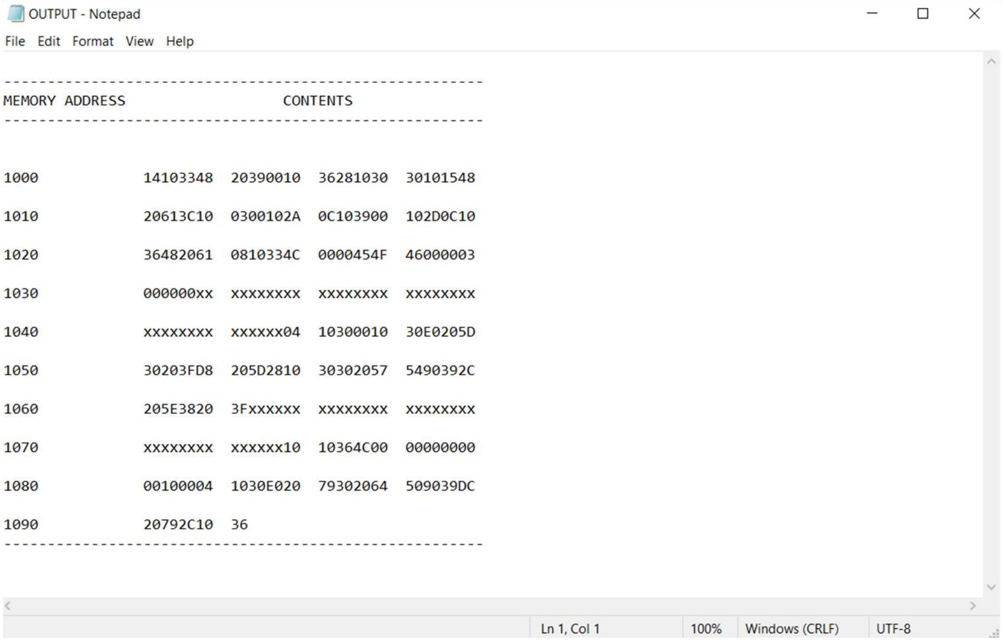
- Loader is the part of the OS that brings an executable file residing on the disk into memory and starts it running.
- Loaders are required to load the object code of a program into the system's main memory. This involves reading the contents of the executable file into the main memory. Once the loading process is completed by the loader, the operating system starts the program by passing control to the loaded program.

UI SCREENSHOTS



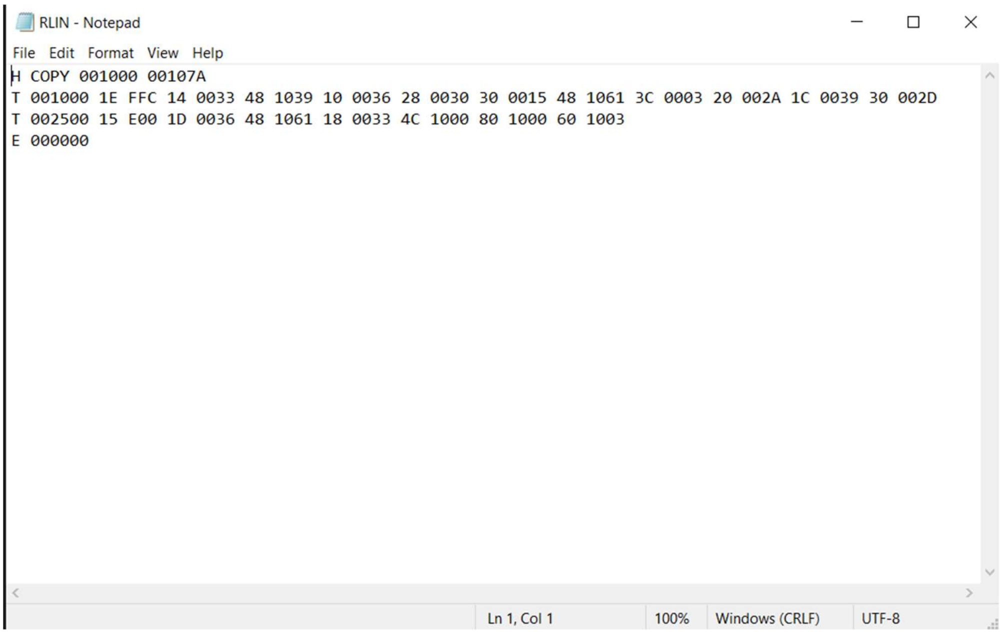
```
H COPY 001000 00107A
T 001000 1E 141033 482039 001036 281030 301015 482061 3C1003 00102A 0C1039 00102D
T 00101E 15 0C1036 482061 081033 4C0000 454F46 000003 000000
T 001047 1E 041030 001030 E0205D 30203F D8205D 281030 302057 549039 2C205E 38203F
T 001077 1C 101036 4C0000 000000 001000 041030 E02079 302064 509039 DC2079 2C1036
E 001000
```

INPUT FOR ABSOLUTE LOADER



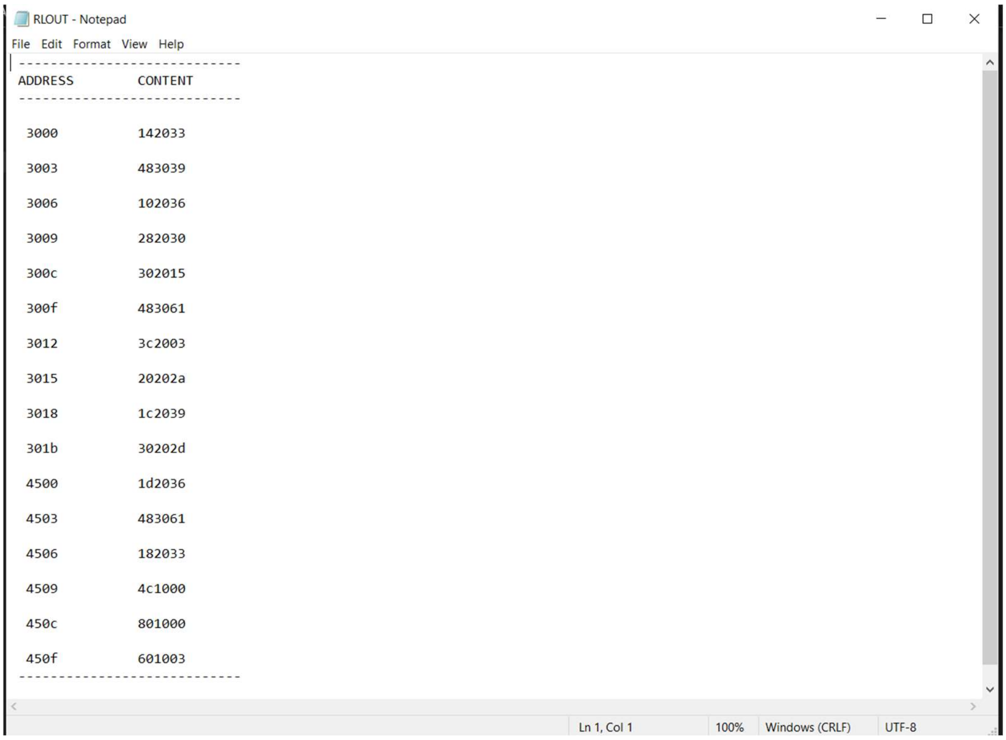
```
-------------------------------------------------------
MEMORY ADDRESS                  CONTENTS
-------------------------------------------------------


1000            14103348  20390010  36281030  30101548

1010            20613C10  0300102A  0C103900  102D0C10

1020            36482061  0810334C  0000454F  46000003

1030            000000xx  xxxxxxxx  xxxxxxxx  xxxxxxxx

1040            xxxxxxxx  xxxxxx04  10300010  30E0205D

1050            30203FD8  205D2810  30302057  5490392C

1060            205E3820  3Fxxxxxx  xxxxxxxx  xxxxxxxx

1070            xxxxxxxx  xxxxxx10  10364C00  00000000

1080            00100004  1030E020  79302064  509039DC

1090            20792C10  36
-------------------------------------------------------
```

OUTPUT OF ABSOLUTE LOADER



```
H COPY 001000 00107A
T 001000 1E FFC 14 0033 48 1039 10 0036 28 0030 30 0015 48 1061 3C 0003 20 002A 1C 0039 30 002D
T 002500 15 E00 1D 0036 48 1061 18 0033 4C 1000 80 1000 60 1003
E 000000
```

INPUT FOR RELOCATION LOADER



```
 ----------------------------
 ADDRESS         CONTENT
 ----------------------------

  3000           142033

  3003           483039

  3006           102036

  3009           282030

  300c           302015

  300f           483061

  3012           3c2003

  3015           20202a

  3018           1c2039

  301b           30202d

  4500           1d2036

  4503           483061

  4506           182033

  4509           4c1000

  450c           801000

  450f           601003
 ----------------------------
```

OUTPUT OF RELOACTION LOADER