Assignment No B1

Title: Dynamic Link Library

Problem Statement: Write a program to create dynamic link library for any mathematical operation and write an application program to test it.
(Java Native Interface/ Use VB on VC++)

Objectives:

1) To understand Dynamic Link Library concepts
2) To study about Visual Basic

Outcomes: I will be able to-

1) Understand and implement DLL
2) Use Visual Basic

Software and Hardware Requirement:

1)Working PC
2) 64 bit Fedora OS
3) Ecplise IDE and Java
4) i5 processor

Theory:

Linking:

Any usable program written in any language has to use functions and subroutines. These functions are either user defined or library function. The linking process makes address of models known to each other so that transform of control take place during execution. Passing of parameters, returning a value from a function and resolving of address of symbolic references are handled by linker. Address of public variables and external variable should be same in every module.

Relocation:

Relocation is the process of modifying the address used in address sensitive instructions of a program. search that the

program can execute correctly from any designated area of memory. Consider function F1 which calls F2 to a scenarios where location is required

1) Storage between the direct address translation of F1 and F2 is getting wasted.

2) F1 and F2 are translated with identical addresses. There are two types of relocation

a) Static b) Dynamic

Program Relocatibility:

It is the ability to load and create a given program into an arbitrary place in memory as opposed to a fixed set of locations specified at program translation time.

Self Relocating Program:

It is a program which performs its own relocation.

It contains:

a) A table of info about address sensitive instructions

b) Relocating logic that performs relocation

c) No linker is required

Static Linking:

Static linker takes the object files produced by compiler, including library function and produces an executable file contains a copy of every subroutine.

Disadvantages:

a) Each executable file has its own copy of library subroutine this lead to waste of memory

b) New version of library functions must be relink into the executable

Dynamic Linking:

It depends too much of the linking process until program starts running. This involves the following steps

a) Reference to external module during runtime causes loader to find the target module and load it

b) Perform relocation during runtime

Advantage:

a) Dynamically linked shared files are easier to create and

update

b) Dynamic linking provides automatic sharing of code

c) New functionality to existing library can be easily added

d) Dynamic linking permits of program to load and unload routine at runtime

Dynamic Link Library (DLL):

File format of DLL and EXE are same. DLL can contain code, data and resources. A shared code is placed in a single separate file. Program that call eat are linked to it at runtime full stop operating system performs the linking.
Dll data is usually private unless requested for. Each process has its own copy of dll data. Assuring dll data allows interprocess communication through the shared memory.

Call Back Function:

A callback function is a function which we recite but it is called by some other program on module coma like Windows or DLL. DLL can call this function in an application, provided it has a pointer to the same.

Steps to implement Callback Funtion:

a) Define Callback Function

b) Declare type for callback function

c) Write code that usu callback

d) Implement function in the client

e) Call to DLL

Callback function can be used to provide event handling for new scenarios.It can be used for a periodic task as well, like timely reports and progress bars.

DLL can be created in 2 ways:

a) With import library linking

b) Without import Library Linking

After compiling the code it provides a DLL

a) An import Library (.lib)
b) An export Library (.exp)

To use DLL with import library
a) Include header file<dlltest.h>
b) Include import library when you are linking object files.

Difference Between .exe and .dll file

A DLL file is a collection of functions which is called by executable file, which is running. DLL can only run when it is inside other executable file which EXE can be standalone file.

Static Binding vs Dynamic Binding:

Static Binding is created before execution of the program. It is carred out by linkage edition which produces an executable file.
Thus no linking is required before calling a function during runtime.

Static Binding is more efficient in terms of technology. However, it requires more memory than dynamic binding. Since, linked routine are a part of the executable program.

Loading phases in Java:

a) Loading
b) Linking-
    i) Bytecode Verification
    ii) Class preparation
    iii) Resolving
c) Initializing

Conclusion: Hence we successfully executed the program to create dynamic link library for any type of mathematical operation.