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Section:

BSCS-9A

Assignment no 4:

Build Automation (Pre-Processors)

Submitted to:

Dr. Omar Usman Khan

Task 3: Converting to Library

Static Library:

```
my_header_file.hpp - Task3 - Visual Studio Code

File Edit Selection View Go Run Terminal Help

my_header_lib.cpp x  my_header_file.hpp x  main.cpp  my_header_file.hpp x

q1 > my_header_lib.cpp
1  #include "my_header_file.hpp"
2
3  void MyClass::myFunction(int x)
4  {
5      if (x % 2 == 0) {
6          std::cout << "even" << s
7      } else {
8          std::cout << "odd" << st
9      }
10
11
12

q1 > my_header_file.hpp
1  #ifndef MY_HEADER_FILE_HPP
2  #define MY_HEADER_FILE_HPP
3
4  #include <iostream>
5
6  class MyClass {
7  public:
8      void myFunction(int x);
9  };
10
11 #endif
12

q1 > my_header_file.hpp
1  #ifndef MY_HEADER_FILE_HPP
2  #define MY_HEADER_FILE_HPP
3
4  #include <iostream>
5
6  class MyClass {
7  public:
8      void myFunction(int x);
9  };
10
11 #endif
12

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/q1$ g++ -c main.cpp -o main.o
• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/q1$ g++ -c my_header_lib.cpp -o my_header_lib.o
• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/q1$ ar -c libMyHeaderLib.a my_header_lib.o
a - my_header_lib.o
• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/q1$
```

Dynamic Library:

```
my_header_file.hpp - Dynamic Library - Visual Studio Code

File Edit Selection View Go Run Terminal Help

my_header_lib.cpp x  my_header_file.hpp x  my_header_file.hpp x  my_header_lib.cpp  main.cpp  ...

my_header_lib.cpp
1  #include "my_header_file.hpp"
2
3  void MyClass::myFunction(int x)
4  {
5      if (x % 2 == 0) {
6          std::cout << "even" <<
7      } else {
8          std::cout << "odd" << s
9      }
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my_header_file.hpp
1  #ifndef MY_HEADER_FILE_HPP
2  #define MY_HEADER_FILE_HPP
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8      void myFunction(int x);
9  };
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11 #endif // MY_HEADER_FILE_HPP
12

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/Dynamic Library$ gcc -shared -Wl,-soname,libMyHeaderLib.so.1 -o libMyHeaderLib.so.1.0
• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/Dynamic Library$ ln -sf libMyHeaderLib.so.1.0 libMyHeaderLib.so.1
• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/Dynamic Library$ ln -sf libMyHeaderLib.so.1.0 libMyHeaderLib.so
• (base) dawood@chattha:~/Documents/Advance Programming/Assignment 4/Task3/Dynamic Library$ LD_LIBRARY_PATH="./libMyHeaderLib.so"
```

1. What is the directory structure of your code before and after the library creation.

Before library creation:

```
├── main.cpp
├── my_header_file.hpp
└── my_header_lib.cpp
```

After library creation:

```
├── libMyHeaderLib.a
├── main.cpp
├── my_header_file.hpp
├── my_header_lib.cpp
└── my_header_lib.o
```

After dynamic library creation:

```
├── libMyHeaderLib.a
├── libMyHeaderLib.so
├── libMyHeaderLib.so.1
├── libMyHeaderLib.so.1.0
├── main.cpp
├── my_header_file.hpp
├── my_header_lib.cpp
└── my_header_lib.o
```

2. What are the CVR arguments?

CVR Arguments:

- C: Create a new archive.
- V: Verbosely list files processed.
- R: Replace or insert files into the archive.

3. Run the commands below and report their output:

1. readelf -S my_header_lib.o

Lists the section headers of the object file.

2. readelf -S your_final_file

Lists the section headers of the final executable.