

ROLL NO. : 422160

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Assignment 03:

Create shell scripts for generating static and dynamic libraries. Utilize an example of your preference. Ensure that the program is not a simple calculator task and also from the provided tutorial material. Each program should incorporate a minimum of two functions based on the selected task.

Main

```
#include <stdio.h>
```

```
#include "functions.h"
```

```
int main() {  
    int num = 10;  
    int fib_result = fibonacci(num);  
    printf("Fibonacci of %d is %d\n", num, fib_result);  
  
    int prime_num = 13;  
    if (is_prime(prime_num))  
        printf("%d is a prime number\n", prime_num);  
    else  
        printf("%d is not a prime number\n", prime_num);  
  
    return 0;  
}
```

Fibonacci

```
#include <stdio.h>
```

```
int fibonacci(int n) {  
    if (n <= 1)  
        return n;  
    else  
        return fibonacci(n-1) + fibonacci(n-2);  
}
```

Prime

```
#include <stdio.h>
```

```
int is_prime(int num) {  
    if (num <= 1)  
        return 0; // Not a prime number  
    for (int i = 2; i * i <= num; i++) {
```

```

        if (num % i == 0)
            return 0; // Not a prime number
    }
    return 1; // Prime number
}

```

Function

```

#ifndef FUNCTIONS_H
#define FUNCTIONS_H

```

```

int fibonacci(int n);
int is_prime(int num);

```

```

#endif

```

OUTPUT:

STATIC:

```

student@student:~/Desktop/422160/unix/week 6$ ls
fibonacci.c functions.h main.c prime.c
student@student:~/Desktop/422160/unix/week 6$ gcc -c fibonacci.c -o fibonacci_obj.o
student@student:~/Desktop/422160/unix/week 6$ gcc -c prime.c -o prime_obj.o
student@student:~/Desktop/422160/unix/week 6$ gcc -c main.c -o main_obj.o
student@student:~/Desktop/422160/unix/week 6$ ar rcs eg_static.a fibonacci_obj.o prime_obj.o
student@student:~/Desktop/422160/unix/week 6$ ls
eg_static.a fibonacci.c fibonacci_obj.o functions.h main.c main_obj.o prime.c prime_obj.o
student@student:~/Desktop/422160/unix/week 6$ gcc -o main_result main_obj.o -L. eg_static.a
student@student:~/Desktop/422160/unix/week 6$ ./main_result
Fibonacci of 10 is 55
13 is a prime number
student@student:~/Desktop/422160/unix/week 6$ ls
eg_static.a fibonacci.c fibonacci_obj.o functions.h main.c main_obj.o main_result prime.c prime_obj.o
student@student:~/Desktop/422160/unix/week 6$
student@student:~/Desktop/422160/unix/week 6$ ^C
student@student:~/Desktop/422160/unix/week 6$ 

```

DYNAMIC:

```
student@student:~/Desktop/422160/unix/week 6$ ls
eg_static.a fibonacci.c fibonacci_obj.o functions.h main.c main_obj.o main_result prime.c prime_obj.o static.txt
student@student:~/Desktop/422160/unix/week 6$ gcc *.o -shared -o eg_dynamic.so
student@student:~/Desktop/422160/unix/week 6$ ls
eg_dynamic.so eg_static.a fibonacci.c fibonacci_obj.o functions.h main.c main_obj.o main_result prime.c prime_obj.o static.txt
student@student:~/Desktop/422160/unix/week 6$ gcc -o main_result main_obj.o -L. eg_dynamic.so
student@student:~/Desktop/422160/unix/week 6$ ./main_result
./main_result: error while loading shared libraries: eg_dynamic.so: cannot open shared object file: No such file or directory
student@student:~/Desktop/422160/unix/week 6$ sudo cp eg_dynamic.so /usr/lib
[sudo] password for student:
student@student:~/Desktop/422160/unix/week 6$ ./main_result
Fibonacci of 10 is 55
13 is a prime number
student@student:~/Desktop/422160/unix/week 6$ sudo rm /usr/lib/eg_dynamic.so
student@student:~/Desktop/422160/unix/week 6$ pwd
/home/student/Desktop/422160/unix/week 6
student@student:~/Desktop/422160/unix/week 6$ export LD_LIBRARY_PATH=
student@student:~/Desktop/422160/unix/week 6$ export LD_LIBRARY_PATH=/home/student/Desktop/422160/unix/week 6
bash: export: `6': not a valid identifier
student@student:~/Desktop/422160/unix/week 6$ export LD_LIBRARY_PATH=/home/student/Desktop/422160/unix
student@student:~/Desktop/422160/unix/week 6$ ./main_result
Fibonacci of 10 is 55
13 is a prime number
student@student:~/Desktop/422160/unix/week 6$ ls
eg_dynamic.so eg_static.a fibonacci.c fibonacci_obj.o functions.h main.c main_obj.o main_result prime.c prime_obj.o static.txt
student@student:~/Desktop/422160/unix/week 6$
student@student:~/Desktop/422160/unix/week 6$ ldd main_result
        linux-vdso.so.1 (0x00007ffc4c3e9000)
        eg_dynamic.so (0x00007fb677e8e000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007fb677c84000)
        /lib64/ld-linux-x86-64.so.2 (0x00007fb677e9a000)
student@student:~/Desktop/422160/unix/week 6$ ^C
student@student:~/Desktop/422160/unix/week 6$
```