

ASSIGNMENT - 3

Example Program for Static Linking:

```
Activities Terminal Mar 6 14:27 student@ai-HP-ProDesk-600-G4-MT: ~/Desktop/422133

student@ai-HP-ProDesk-600-G4-MT:~$ cd Desktop
student@ai-HP-ProDesk-600-G4-MT:~/Desktop$ cd 422133
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ls
fact.c head.h main.c sum.c
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ar rcs eg_static.a sum_obj.o fact_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ls
eg_static.a fact.c fact_obj.o head.h main.c main_obj.o sum.c sum_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ gcc -o main_result main_obj.o -L, eg_static.a
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ./main_result
Factorial of 1 is 1
Factorial of 2 is 2
Factorial of 3 is 6
Factorial of 4 is 24
Factorial of 5 is 120
Factorial of 6 is 720
Factorial of 7 is 5040
Factorial of 8 is 40320
Factorial of 9 is 362880
Factorial of 10 is 3628800
Factorial of 11 is 39916800
Factorial of 12 is 479001600
Adding digit 2 to the sum. Current sum: 2
Adding digit 1 to the sum. Current sum: 3
Sum of digits of 12 is: 3
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ls
eg_static.a fact.c fact_obj.o head.h main.c main_obj.o main_result sum.c sum_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$
```

Example Program for Dynamic Linking:

```
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ls
eg_static.a fact_obj.o main.c main_result sum_obj.o
fact.c head.h main_obj.o sum.c
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ gcc *.o -shared -o eg_dynamic.so
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ls
eg_dynamic.so fact.c head.h main_obj.o sum.c
eg_static.a fact_obj.o main.c main_result sum_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ gcc -o main_result main_obj.o -L. eg_dynamic.so
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ./main_result
./main_result: error while loading shared libraries: eg_dynamic.so: cannot open shared object file: No such file or directory
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ldd main_result
linux-vdso.so.1 (0x00007ffde25e5000)
eg_dynamic.so => not found
libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007fb413254000)
/lib64/ld-linux-x86-64.so.2 (0x00007fb413466000)
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ export LD_LIBRARY_PATH=./:~/Desktop/422133
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$ ./main_result
Factorial of 1 is 1
Factorial of 2 is 2
Factorial of 3 is 6
Factorial of 4 is 24
Factorial of 5 is 120
Factorial of 6 is 720
Factorial of 7 is 5040
Factorial of 8 is 40320
Factorial of 9 is 362880
Factorial of 10 is 3628800
Factorial of 11 is 39916800
Factorial of 12 is 479001600
Adding digit 2 to the sum. Current sum: 2
Adding digit 1 to the sum. Current sum: 3
Sum of digits of 12 is: 3
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133$
```

Custom Static Linking:

```
student@ai-HP-ProDesk-600-G4-MT: ~/Desktop/422133wk7

student@ai-HP-ProDesk-600-G4-MT:~$ cd Desktop
student@ai-HP-ProDesk-600-G4-MT:~/Desktop$ cd 422133wk7
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ls
head.h main.c op1.c op2.c
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ gcc -c op1.c -o op1_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ gcc -c op2.c -o op2_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ gcc -c main.c -o main_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ar rcs eg_static.a op1_obj.o op2_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ls
eg_static.a head.h main.c main_obj.o op1.c op1_obj.o op2.c op2_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ gcc -o main_result main_obj.o -L. eg_static.a
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ./main_result
Corresponding characters: BEAHDAJDIJAADBB
Enter a number: 123456
Number after removing even positioned digits: 246
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$
```

Custom Dynamic Linking:

```
student@ai-HP-ProDesk-600-G4-MT: ~/Desktop/422133wk7

student@ai-HP-ProDesk-600-G4-MT:~$ cd Desktop
student@ai-HP-ProDesk-600-G4-MT:~/Desktop$ cd 422133wk7
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ls
eg_static.a main.c main_result op1_obj.o op2_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ gcc *.o -shared -o eg_dynamic.so
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ls
eg_dynamic.so eg_static.a head.h main.c main_obj.o main_result op1.c op1_obj.o op2.c op2_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ gcc -o main_result main_obj.o -L. eg_dynamic.so
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ./main_result
./main_result: error while loading shared libraries: eg_dynamic.so: cannot open shared object file: No such file or directory
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ sudo cp eg_dynamic.so/usr/lib
[sudo] password for student:
cp: missing destination file operand after 'eg_dynamic.so/usr/lib'
Try 'cp --help' for more information.
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ export LD_LIBRARY_PATH=./home/Desktop/422133wk7
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ./main_result
Corresponding characters: BEAHCEGCECDHJBB
Enter a number: 123456
Number after removing even positioned digits: 246
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ls
eg_dynamic.so eg_static.a head.h main.c main_obj.o main_result op1.c op1_obj.o op2.c op2_obj.o
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$ ldd main_result
        linux-vdso.so.1 (0x00007ffcecc435000)
        eg_dynamic.so (0x00007fa22464c000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007fa224441000)
        /lib64/ld-linux-x86-64.so.2 (0x00007fa224658000)
student@ai-HP-ProDesk-600-G4-MT:~/Desktop/422133wk7$
```

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