Hands on Library

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Create file

mathfun.h

```c
#ifndef MATHFUN_H
#define MATHFUN_H

int check_prime(int data);
int test_digit(int data);
int test_ascend(int data);
int test_descend(int data);

#endif
```

Mathfun.c

```c
#include "mathfun.h"
#include <stdbool.h>

int check_prime(int data)
{
    if (data <= 1)
        return 0; // 1 and below are not prime
    for (int i = 2; i * i <= data; i++)
    {
        if (data % i == 0)
            return 0; // If divisible, not prime
    }
    return 1; // If no divisors found, it's prime
}
```

```c
int test_digit(int data)
{
    while (data > 0)
    {
        if (data % 10 == 3)
            return 1; // If any digit is 3, return true
        data /= 10;
    }
    return 0; // If no 3 found, return false
}
```

```c
int test_descend(int data)
{
    int last_digit = -1; // Start with -1 as no digit can be smaller
    while (data > 0)
    {
        int current_digit = data % 10;
        if (current_digit < last_digit)
            return 0; // If not descending or equal, return false
        last_digit = current_digit;
        data /= 10;
    }
    return 1; // If all digits were descending or equal, return true
}
```

```c
int test_ascend(int data)
{
    int last_digit = 10; // Start with 10 as no digit can be larger
    while (data > 0)
    {
        int current_digit = data % 10;
        if (current_digit > last_digit)
            return 0; // If not ascending or equal, return false
        last_digit = current_digit;
        data /= 10;
    }
    return 1; // If all digits were ascending or equal, return true
}
```

Main.c

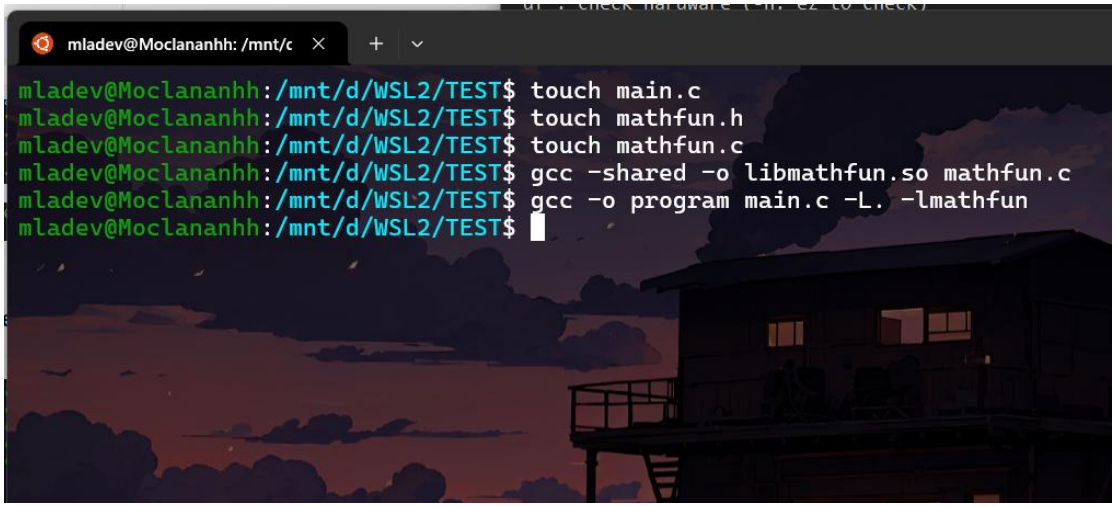
```c
int main()
{
    printf("Prime numbers between 100 and 1000 that contain the digit 3 and have digits in
non-descending or non-ascending order:\n");

    int first = 1;
    for (int i = 100; i <= 1000; i++)
    {
        if (check_prime(i) && test_digit(i) && (test_ascend(i) || test_descend(i)))
        {
            if (!first)
            {
                printf(",");
            }
            printf("%d", i);
            first = 0;
```

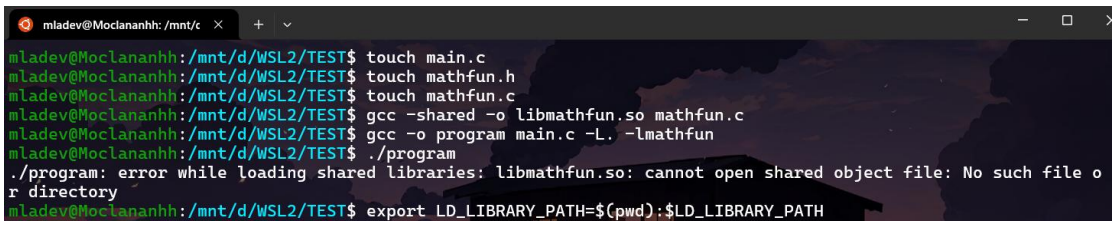
```
        }
    }
    return 0;
}
```

Compile the lib.c file into a shared library:

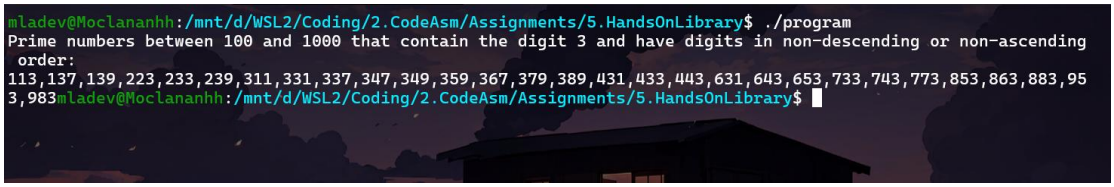
Compile the main.c file and link it with the shared library



Export Loading share library



Run program:


mladev@Moclananhh:/mnt/d/WSL2/Coding/2.CodeAsm/Assignments/5.HandsOnLibrary$ ./program
Prime numbers between 100 and 1000 that contain the digit 3 and have digits in non-descending or non-ascending order:
113,137,139,223,233,239,311,331,337,347,349,359,367,379,389,431,433,443,631,643,653,733,743,773,853,863,883,953,983mladev@Moclananhh:/mnt/d/WSL2/Coding/2.CodeAsm/Assignments/5.HandsOnLibrary$