UNIX LAB

WEEK-6

LINKING OF LIBRARIES

Code to stock the list of products in a fruit store.

```c
#include "header.h"
// Structure for each item in stock

// Function to create a new item
Item *newItem(char *name, int quantity) {
    Item *item = (Item *)malloc(sizeof(Item));
    strcpy(item->name, name);
    item->quantity = quantity;
    item->left = NULL;
    item->right = NULL;
    return item;
}

// Function to insert a new item into the stock BST
Item *insert(Item *root, char *name, int quantity) {
    if (root == NULL)
        return newItem(name, quantity);

    if (strcmp(name, root->name) < 0)
        root->left = insert(root->left, name, quantity);
    else if (strcmp(name, root->name) > 0)
        root->right = insert(root->right, name, quantity);
    else
        root->quantity += quantity;

    return root;
}
```

```c
// Function to search for an item in the stock BST
#include "header.h"

Item *search(Item *root, char *name) {
    if (root == NULL || strcmp(root->name, name) == 0)
        return root;

    if (strcmp(name, root->name) < 0)
        return search(root->left, name);
    else
        return search(root->right, name);
}
```

```c
#include "header.h"



// Function to print the items in the stock BST (inorder traversal)
void printStock(Item *root) {
    if (root != NULL) {
        printStock(root->left);
        printf("%s - Quantity: %d\n", root->name, root->quantity);
        printStock(root->right);
    }
}
```

```c
#include<stdio.h>
#include<stdlib.h>
#include<string.h>


typedef struct Item {
    char name[50];
    int quantity;
    struct Item *left;
    struct Item *right;
} Item;

Item *newItem(char *name, int quantity);
Item *insert(Item *root, char *name, int quantity);
Item *search(Item *root, char *name);
void printStock(Item *root) ;
```

```c
2  #include "header.h"
3
4  int main() {
5      Item *stock = NULL;
6
7      // Adding items to the stock
8      stock = insert(stock, "Apple", 10);
9      stock = insert(stock, "Banana", 15);
10     stock = insert(stock, "Orange", 20);
11     stock = insert(stock, "Grapes", 25);
12     stock = insert(stock, "Pineapple", 30);
13
14     // Printing the current stock
15     printf("Current stock:\n");
16     printStock(stock);
17     printf("\n");
18
19     // Searching for an item in the stock
20     char searchItem[50];
21     printf("Enter the name of the item you want to search for: ");
22     scanf("%s", searchItem);
23     Item *result = search(stock, searchItem);
24     if (result != NULL)
25         printf("%s - Quantity: %d\n", result->name, result->quantity);
26     else
27         printf("Item not found in stock.\n");
28
29     return 0;
30 }
```

Static Linking of libraries

```
eg_dynamic.so    fact_obj.o    head.h        main2.c      main_obj.o      printstock.o    sum.c
eg_static.a      header.h      insert.c      main2.o      main_result2    search.c        sum_obj.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ sudo gcc -o result1 main2.o -L. task_static.a
[sudo] password for sridhar:
/usr/bin/ld:main2.o: file format not recognized; treating as linker script
/usr/bin/ld:main2.o:50: syntax error
collect2: error: ld returned 1 exit status
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -c insert.c -o insert1.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -c search.c -o search1.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -c printstock.c -o printstock1.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -c main2.c -o main3.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ar rcs task1_static.a insert1.o search1.o printstock1.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ls
 charFreq.c      fact_obj.o    insert1.o     main2.o       main_result2    search1.o     sum_obj.o
 eg_dynamic.so   header.h      insert.c      main3.o       printstock1.o   search.c      task1_static.a
 eg_static.a    'header.h\'    insert.o      main.c        printstock.c    search.o      task_static.a
 fact.c          head.h        main2.c       main_obj.o    printstock.o    sum.c
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -o result_1 main3.o -L. task1_static.a
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ./result_1
Current stock:
Apple - Quantity: 10
Banana - Quantity: 15
Grapes - Quantity: 25
Orange - Quantity: 20
Pineapple - Quantity: 30

Enter the name of the item you want to search for: Apple
Apple - Quantity: 10
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ls
 charFreq.c      fact_obj.o    insert1.o     main2.o       main_result2    result_1     sum.c
 eg_dynamic.so   header.h      insert.c      main3.o       printstock1.o   search1.o    sum_obj.o
 eg_static.a    'header.h\'    insert.o      main.c        printstock.c    search.c     task1_static.a
 fact.c          head.h        main2.c       main_obj.o    printstock.o    search.o     task_static.a
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc
```

Dynamic Linking of Libraries.

Activities   Terminal   Mar 12 09:05

sridhar@sridhar-VirtualBox: ~/Desktop/scripts/week6

```
sridhar@sridhar-VirtualBox:~$ cd Desktop
sridhar@sridhar-VirtualBox:~/Desktop$ cd scripts/
sridhar@sridhar-VirtualBox:~/Desktop/scripts$ cd week6/
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ls
 charFreq.c       'header.h\'    main3.o          printstock.o    task1_static.a
 eg_dynamic.so    head.h        main.c           result_1        task_static.a
 eg_static.a      insert1.o     main_obj.o       search1.o
 fact.c           insert.c      main_result2     search.c
 fact_obj.o       main2.c       printstock1.o    sum.c
 header.h         main2.o       printstock.c     sum_obj.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc *.o -shared -o eg_dynamic2.so
/usr/bin/ld:main2.o: file format not recognized; treating as linker script
/usr/bin/ld:main2.o:50: syntax error
collect2: error: ld returned 1 exit status
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc *.o -shared -o eg_dynamic2.so
/usr/bin/ld:main2.o: file format not recognized; treating as linker script
/usr/bin/ld:main2.o:50: syntax error
collect2: error: ld returned 1 exit status
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc *.o -shared -o eg_dynamic2.so
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ls
 charFreq.c       header.h      main2.c          printstock.c    task1_static.a
 eg_dynamic2.so   'header.h\'   main3.o          result_1        task_static.a
 eg_dynamic.so    head.h        main.c           search1.o
 eg_static.a      insert1.o     main_result2     search.c
 fact.c           insert.c      printstock1.o    sum.c
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -o result_2 main3.o  -L. eg_dynamic2.so
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ./result_2
./result_2: error while loading shared libraries: eg_dynamic2.so: cannot open shared object file: No such file or direc
tory
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ sudo cp eg_dynamic2.so /usr/lib
[sudo] password for sridhar:
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ./result_2
Current stock:
Apple - Quantity: 10
```

Activities   Terminal   Mar 12 09:05

sridhar@sridhar-VirtualBox: ~/Desktop/scripts/week6

```
fact_obj.o        main2.c        printstock1.o    sum.c
header.h          main2.o        printstock.c     sum_obj.o
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc *.o -shared -o eg_dynamic2.so
/usr/bin/ld:main2.o: file format not recognized; treating as linker script
/usr/bin/ld:main2.o:50: syntax error
collect2: error: ld returned 1 exit status
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc *.o -shared -o eg_dynamic2.so
/usr/bin/ld:main2.o: file format not recognized; treating as linker script
/usr/bin/ld:main2.o:50: syntax error
collect2: error: ld returned 1 exit status
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc *.o -shared -o eg_dynamic2.so
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ls
 charFreq.c        header.h        main2.c          printstock.c    task1_static.a
 eg_dynamic2.so   'header.h\'      main3.o          result_1        task_static.a
 eg_dynamic.so     head.h          main.c           search1.o
 eg_static.a       insert1.o       main_result2     search.c
 fact.c            insert.c        printstock1.o    sum.c
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ gcc -o result_2 main3.o  -L. eg_dynamic2.so
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ./result_2
./result_2: error while loading shared libraries: eg_dynamic2.so: cannot open shared object file: No such file or direc
tory
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ sudo cp eg_dynamic2.so /usr/lib
[sudo] password for sridhar:
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ./result_2
Current stock:
Apple - Quantity: 10
Banana - Quantity: 15
Grapes - Quantity: 25
Orange - Quantity: 20
Pineapple - Quantity: 30

Enter the name of the item you want to search for: Banana
Banana - Quantity: 15
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$
```

Activities   Terminal   Mar 12 09:08

sridhar@sridhar-VirtualBox: ~/Desktop/scripts/week6

```
Current stock:
Apple - Quantity: 10
Banana - Quantity: 15
Grapes - Quantity: 25
Orange - Quantity: 20
Pineapple - Quantity: 30

Enter the name of the item you want to search for: Banana
Banana - Quantity: 15
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ pwd
/home/sridhar/Desktop/scripts/week6
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ export LD_LIBRARY_PATH=:^C
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ^C
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ export LD_LIBRARY_PATH=:/home/sridhar/Desktop/scripts/week6
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ./result_2
Current stock:
Apple - Quantity: 10
Banana - Quantity: 15
Grapes - Quantity: 25
Orange - Quantity: 20
Pineapple - Quantity: 30

Enter the name of the item you want to search for: Grapes
Grapes - Quantity: 25
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ls
 charFreq.c      eg_static.a  'header.h\'   insert.c    main.c          printstock.c    search1.o    task1_static.a
 eg_dynamic2.so  fact.c        head.h        main2.c     main_result2    result_1        search.c     task_static.a
 eg_dynamic.so   header.h      insert1.o     main3.o     printstock1.o   result_2        sum.c
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$ ldd result_2
        linux-vdso.so.1 (0x00007ffdaefd1000)
        eg_dynamic2.so (0x00007efccb51a000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007efccb200000)
        ib64/ld-linux-x86-64.so.2 (0x00007efccb526000)
sridhar@sridhar-VirtualBox:~/Desktop/scripts/week6$
```

Show Apps

28°   Search   ENG   09:08
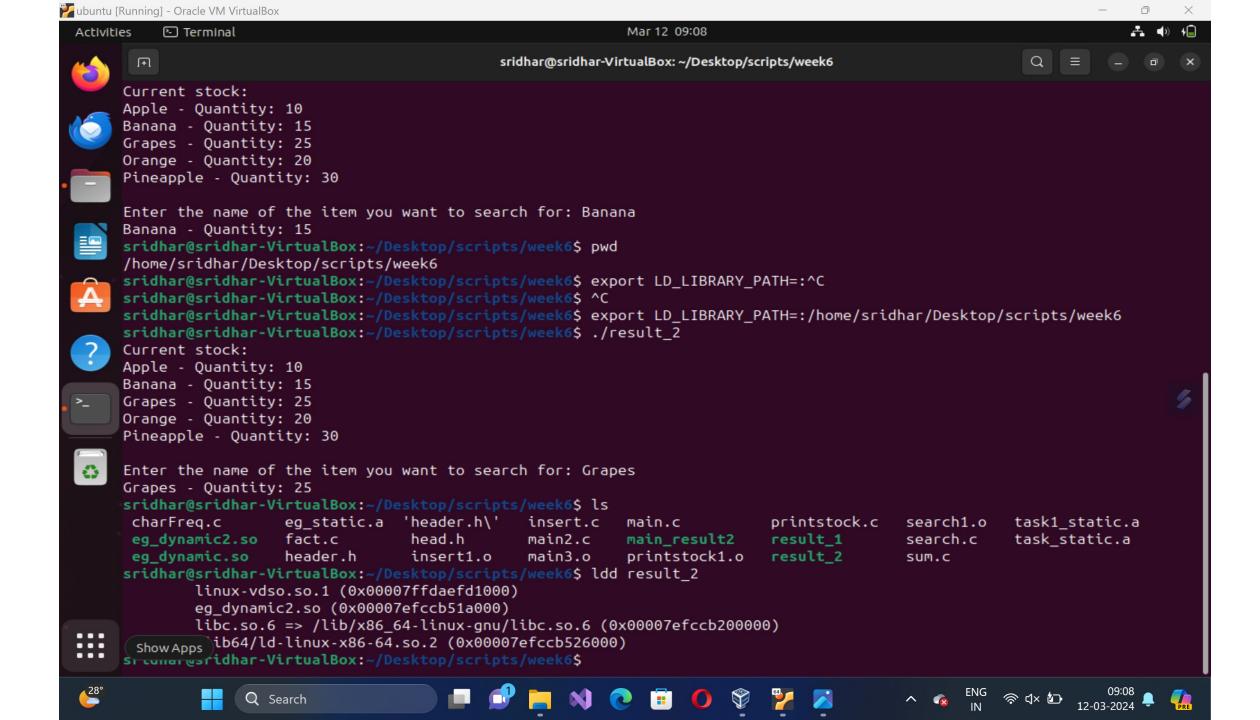   IN   12-03-2024

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