



Week 10: Programs to demonstrate Searching techniques, Call backs ,
Command line arguments and ENUM

2021

Name:Jacob V Sanoj	SRN:PES1UG20EC083	Section:F
	Date:13-07-2021	Week Number:10

1	<p>Implement Binary Search using a call back when there is more than one constraint to check for.</p> <p>a) Search for a number if the number is even</p> <p>b) Search for a number if the number is less than 22.</p> <p>Input:</p> <p>enter the element to be searched</p> <p>18</p> <p>Output:</p> <p>It is even and found at 2 position</p> <p>It is less than 22 and found at 2 position</p> <p>Input:</p> <p>enter the element to be searched</p> <p>56</p> <p>Output:</p> <p>It is even and found at 8 position</p> <p>not found</p> <p>Input:</p> <p>enter the element to be searched</p>
---	--

53

Output:

not found

not found

Program:

```
#include <stdio.h>

int even(int x)
{
    return x % 2 == 0;
}

int less(int x)
{
    return x < 22;
}

int binarySearch(int a[], int start, int end, int key, int (*q)(int))
{
    int pos = -1, mid;

    if (start > end)
    {
        return pos;
    }
    else
    {
        mid = (start + end) / 2;
```

```
    if (a[mid] == key && q(key))
    {
        pos = mid;
    }

    else if (key < a[mid])
    {
        return binarySearch(a, start, mid - 1, key, q);
    }

    else
        return binarySearch(a, mid + 1, end, key, q);
}

return pos;
}

int main()
{
    int a[] = {10, 12, 14, 15, 17, 18, 20, 23};

    printf("Enter the number to be searched in the given\narray\n");

    for (int i = 0; i < 8; i++)
    {
        printf("%d  ", a[i]);
    }

    printf("\n");
}
```

```
int n = sizeof(a) / sizeof(*a);
int key;


scanf("%d", &key);
int p = binarySearch(a, 0, n - 1, key, even);

if (p != -1)
{
    printf("It is even and found in the position %d\n", p);
}
else
    printf("It is not even/found\n");

p = binarySearch(a, 0, n - 1, key, less);

if (p != -1)
{
    printf("It is less than 22 and found in the position
%d\n", p);
}
else
    printf("It is not less than 22/found\n");
}
```

Output Screenshot:



```

jacob@jacob-Vostro-3501:~/Documents/Classes/Sem2/C_LAB/Code/Week_10$ cd "/home/jacob/Documents/Classes/Sem2/C_LAB/Code/Week_10/" && gcc Question1.c -o Question1 && "/home/jacob/Documents/Classes/Sem2/C_LAB/Code/Week_10/Question1"
Enter the number to be searched in the given array
10 12 14 15 17 18 20 23
18
It is even and found in the position 5
It is less than 22 and found in the position 5
jacob@jacob-Vostro-3501:~/Documents/Classes/Sem2/C_LAB/Code/Week_10$

```

2

Write a program to copy the contents of one file to another using command line arguments

(Instruction to be given in the command line)

>a abc.txt def.txt

(abc.txt is the file having contents which will be copied to the file def.txt)

Program:

```

#include <stdio.h>

int main(int argc, char *argv[])
{
    FILE *fs, *ft;
    int ch;

```

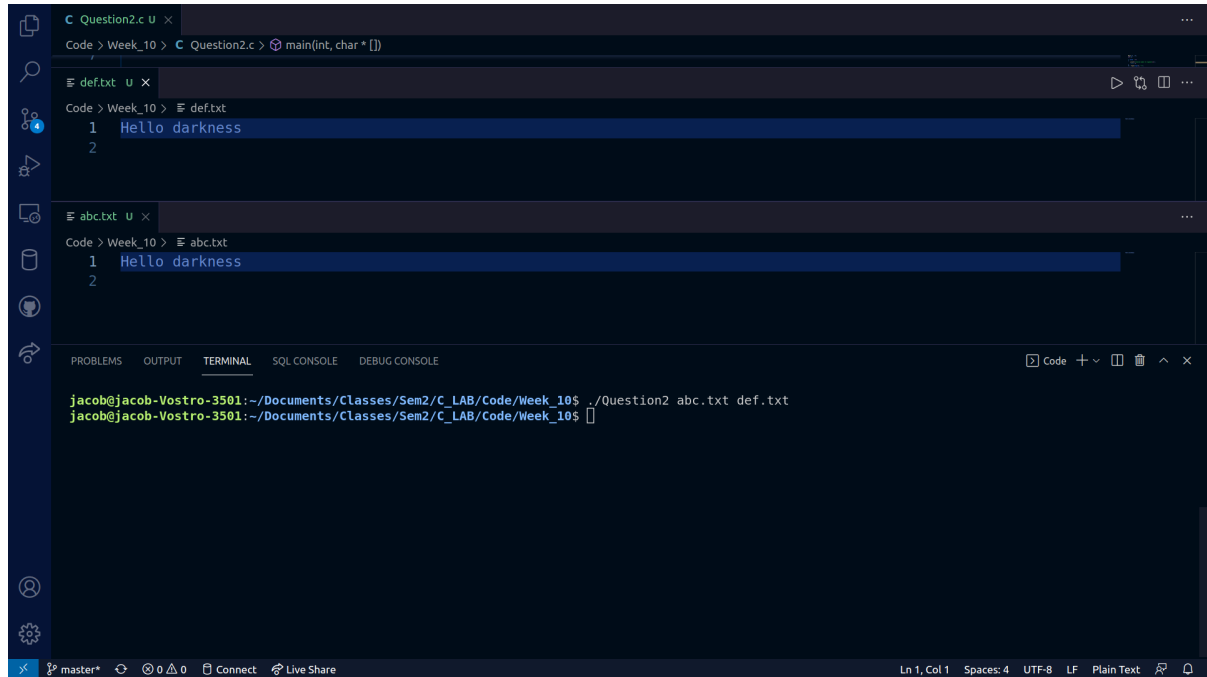
```
if (argc != 3)
{
    printf("Invalid number of arguments\n");
    return 1;
}
fs = fopen(argv[1], "r");

if (fs == NULL)
{
    printf("Cannot find the requested file\n");
    return 1;
}
ft = fopen("def.txt", "w");

if (ft == NULL)
{
    printf("Cannot find the requested file\n");
    return 1;
}

while (1)
{
    ch = fgetc(fs);
    if (feof(fs))
        break;
    fputc(ch, ft);
}
fclose(fs);
fclose(ft);
}
```

Output Screenshot:



```

C Question2.c u x
Code > Week_10 > C Question2.c > main(int, char * [])

def.txt u x
Code > Week_10 > def.txt
1 Hello darkness
2

abc.txt u x
Code > Week_10 > abc.txt
1 Hello darkness
2

PROBLEMS OUTPUT TERMINAL SQL CONSOLE DEBUG CONSOLE
jacob@jacob-Vostro-3501:~/Documents/Classes/Sem2/C_LAB/Code/Week_10$ ./Question2 abc.txt def.txt
jacob@jacob-Vostro-3501:~/Documents/Classes/Sem2/C_LAB/Code/Week_10$
  
```

3 Write a program using enumerated types which when given today's date will print out tomorrow's date.

Input:

Enter a date (number 3 letter lower case month e.g. 31 jan)

30 nov

Output:

Tomorrow is 1 dec

Input:

Enter a date (number 3 letter lower case month e.g. 31 jan)

31 dec

Output:

Tomorrow is 1 jan

Program:

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

enum months
{
    jan,
    feb,
    mar,
    apr,
    may,
    jun,
    jul,
    aug,
    sep,
    oct,
    nov,
    dec,
    NOT_MONTH
} month;

static char *month_out[] = {"jan", "feb", "mar", "apr", "may",
"jun", "jul", "aug", "sep", "oct", "nov", "dec", "NOT_MONTH"};
static int days_in_month[] = {31, 28, 31, 30, 31, 30, 31, 31,
30, 31, 30, 31};

enum months translate(char *);
void check(int, enum months);
```



```
void tomorrow(int, enum months);

int main()
{
    int day;
    char mon[4];

    printf("Enter a date (number 3 letter lower case month e.g. 31 jan) \n");
    scanf("%d %s", &day, mon);

    month = translate(mon);

    check(day, month);

    tomorrow(day, month);
}

enum months translate(char *m)
{
    if (strcmp(m, "jan") == 0)
        return jan;
    else if (strcmp(m, "feb") == 0)
        return feb;
    else if (strcmp(m, "mar") == 0)
        return mar;
    else if (strcmp(m, "apr") == 0)
        return apr;
    else if (strcmp(m, "may") == 0)
        return may;
    else if (strcmp(m, "jun") == 0)
```

```
        return jun;
    else if (strcmp(m, "jul") == 0)
        return jul;
    else if (strcmp(m, "aug") == 0)
        return aug;
    else if (strcmp(m, "sep") == 0)
        return sep;
    else if (strcmp(m, "oct") == 0)
        return oct;
    else if (strcmp(m, "nov") == 0)
        return nov;
    else if (strcmp(m, "dec") == 0)
        return dec;
    else
        return NOT_MONTH;
}

void check(int day, enum months month_in)
{
    if ((month_in == NOT_MONTH) || (day < 1) || (day >
days_in_month[month]))
    {
        printf("Error: Invalid Input %d %s\n", day,
month_out[month_in]);
    }
}

void tomorrow(int day, enum months month_in)
{
    if (day < days_in_month[month_in])
```



The image shows a Visual Studio Code (VS Code) interface with a terminal window open. The terminal displays the following text:

```

jacob@jacob-Vostro-3501:~/Documents/Classes/Sem2/C_LAB/Code/Week_10$ cd "/home/jacob/Documents/Classes/Sem2/C_LAB/Code/Week_10/" && gcc Question3.c -
o Question3 && "/home/jacob/Documents/Classes/Sem2/C_LAB/Code/Week_10/" && gcc Question3
Enter a date (number 3 letter lower case month e.g. 31 jan)
30 jun
Tomorrow is 1 jul
jacob@jacob-Vostro-3501:~/Documents/Classes/Sem2/C_LAB/Code/Week_10$

```

The VS Code interface includes a sidebar on the left with icons for Explorer, Search, Source Control, Run and Debug, and Extensions. The top of the window shows tabs for PROBLEMS, OUTPUT, TERMINAL (active), SQL CONSOLE, and DEBUG CONSOLE. The bottom status bar indicates the current file is 'master*', the cursor is at line 5, column 2, and the encoding is UTF-8.