

Lab Exercise – 2.2

- ❖ AIM :: WAP in C to implement basic operations in different functions on Linux using vi-Editor.

Source_Code ::

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

// Function to print the Fibonacci series up to n terms
void fibonacci(int n)
{
    int first = 0, second = 1, next;

    if (n <= 0) {
        printf("Please enter a positive integer.\n");
        return;
    }

    printf("Fibonacci Series: ");
    for (int i = 1; i <= n; i++) {
        if (i == 1) {
            printf("%d ", first);
            continue;
        }
        if (i == 2) {
            printf("%d ", second);
```

```
        continue;
    }
    next = first + second;
    first = second;
    second = next;
    printf("%d ", next);
}
printf("\n");
}
```

// Function to calculate the factorial of a number

```
int factorial(int n)
{
    if (n == 0) {
        return 1;
    }
    return n * factorial(n - 1);
}
```

// Function to calculate the sum of digits of a number

```
int digitsSum(int num)
{
    int sum = 0;
    while (num != 0) {
        sum += num % 10;
        num /= 10;
    }
    return sum;
}
```

// Function to check if a string is a palindrome

```
bool isPalindrome(char str[])
```

```
{  
    int length = strlen(str);  
    int start = 0;  
    int end = length - 1;  
  
    while (start < end) {  
        if (str[start] != str[end]) {  
            return false;  
        }  
        start++;  
        end--;  
    }  
    return true;  
}
```

// Function to count the occurrences of a character in a string

```
int countChar(char* str, char ch)  
{  
    int count = 0;  
    for (int i = 0; str[i] != '\0'; i++) {  
        if (str[i] == ch) {  
            count++;  
        }  
    }  
    return count;  
}
```

```
int main()
```

```
{  
  
    int choice, num1, num2, num3;  
    char str[100], ch;
```

```
printf("\n5C6 - Amit Singhal (11614802722)\n");
```

```
// Display the menu
```

```
printf("\nMenu:\n");
```

```
printf("1. Print Fibonacci Series\n");
```

```
printf("2. Calculate Factorial\n");
```

```
printf("3. Calculate Sum of Digits\n");
```

```
printf("4. Check Palindrome\n");
```

```
printf("5. Count Character Occurrences\n");
```

```
printf("6. Exit\n");
```

```
while (1) {
```

```
    printf("\nEnter your choice (1-6): ");
```

```
    scanf("%d", &choice);
```

```
    switch (choice) {
```

```
        case 1:
```

```
            printf("\nEnter the number of terms for Fibonacci series: ");
```

```
            scanf("%d", &num1);
```

```
            fibonacci(num1);
```

```
            break;
```

```
        case 2:
```

```
            printf("\nEnter a number to calculate its factorial: ");
```

```
            scanf("%d", &num1);
```

```
            printf("Factorial: %d\n", factorial(num1));
```

```
            break;
```

```
        case 3:
```

```
            printf("\nEnter a number to calculate the sum of its digits: ");
```

```
            scanf("%d", &num1);
```

```
            printf("Sum of Digits: %d\n", digitsSum(num1));
```

break;

case 4:

printf("Enter a string to check if it is a palindrome: ");

scanf("%s", str);

if (isPalindrome(str)) {

printf("%s is a Palindrome\n", str);

} else {

printf("%s is not a Palindrome\n", str);

}

break;

case 5:

printf("\nEnter a string: ");

scanf("%s", str);

printf("Enter a character to count its occurrences: ");

scanf(" %c", &ch);

printf("Count of '%c': %d\n", ch, countChar(str, ch));

break;

case 6:

printf("\nExiting the program. Have a great day!\n");

return 0;

default:

printf(

"\nInvalid choice! Please select a number between 1 and 6.\n");

}

}

return 0;

}

Output ::

```
amit@Toshiba-Satellite-C850:~/Downloads/OS$ vi basic_operations_2.c
```

```
amit@Toshiba-Satellite-C850:~/Downloads/OS$ gcc basic_operations_2.c -o prg_2
```

```
amit@Toshiba-Satellite-C850:~/Downloads/OS$ ./prg_2
```

5C6 - Amit Singhal (11614802722)

Menu:

1. Print Fibonacci Series
2. Calculate Factorial
3. Calculate Sum of Digits
4. Check Palindrome
5. Count Character Occurrences
6. Exit

Enter your choice (1-6): 1

Enter the number of terms for Fibonacci series: 9

Fibonacci Series: 0 1 1 2 3 5 8 13 21

Enter your choice (1-6): 12

Invalid choice! Please select a number between 1 and 6.

Enter your choice (1-6): 2

Enter a number to calculate its factorial: 12

Factorial: 479001600

Enter your choice (1-6): 3

Enter a number to calculate the sum of its digits: 35544355

Sum of Digits: 34

Enter your choice (1-6): 4

Enter a string to check if it is a palindrome: madam

madam is a Palindrome

Enter your choice (1-6): 5

Enter a string: helloworld

Enter a character to count its occurrences: l

Count of 'l': 3

Enter your choice (1-6): 6

Exiting the program. Have a great day!

```
amit@Toshiba-Satellite-C850:~/Downloads/OS$ |
```