Indian Institute of Engineering Science and Technology, Shibpur

Department of Information Technology

Programming Laboratory

Tathagata Ghosh --- 2020ITB065 --- HY

07/09/2021

```c
/*Programming Laboratory Assignment 2021
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/* Q1. Write a C program to find the sum of individual digits of a positive in
teger.*/

#include <stdio.h>

int main()
{
    int n;
    printf("Enter a number: ");
    scanf("%d", &n);
    int t = n;
    int sum = 0;
    while (t > 0)
    {
        int d = t % 10;
        sum = sum + d;
        t /= 10;
    }

    printf("Sum of digits of %d = %d \n", n, sum);
    return 0;
}
```

OUTPUT :-

1.

Enter a number: 1947

Sum of digits of 1947 = 21

2.

Enter a number: 2021

Sum of digits of 2021 = 5

```c
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/* Q2. Write a C program that uses functions to perform the following operatio
ns:
i) To insert a sub-string in to given main string from a given position.
ii) To delete n characters from a given position in a given string.*/

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

void addSubStr(char s[])
{
    char news[1000] = {'\0'};
    char sub[1000];
    printf("Enter the substring to insert: \n");
    gets(sub);

    printf("Enter the position from where you want to insert to insert: \n");
    int k;
    scanf("%d", &k);

    for (int i = 0; i < k; i++)
    {
        news[i] = s[i];
    }
    for (int i = k; i < k + strlen(sub); i++)
    {
        news[i] = sub[i - k];
    }
    int i = k, j = k + strlen(sub);
    while (s[i] != '\0')
    {
        news[j] = s[i];
        i++;
        j++;
    }
    printf("New string is: %s \n", news);
}

void deleteChars(char s[])
{
    printf("Enter number of characters to delete: ");
    int n;
    scanf("%d", &n);
    printf("Enter the position from which to delete: ");
```

```
    int k;
    scanf("%d", &k);

    char news[1000] = {'\0'};
    int i = 0, j = 0;
    while (s[i] != '\0')
    {
        if (i == k)
        {
            i += n;
        }
        news[j] = s[i];
        i++;
        j++;
    }
    printf("New string is: %s \n", news);
}

int main()
{
    char s[1000];

    printf("Enter a string: \n");
    gets(s);

    printf("Enter 1: To insert a sub-
string in to given main string from a given position \n");
    printf("Enter 2: To delete n characters from a given position in the given
 string \n");
    printf("Enter your choice: \n");

    int ch;
    scanf("%d", &ch);
    int a = getchar();

    if (ch == 1)
    {
        addSubStr(s);
    }
    else if (ch == 2)
    {
        deleteChars(s);
    }
    else
    {
        printf("Enter a valid choice! \n");
    }
    return 0;
```

```
}
```

OUTPUT :-

1.

Enter a string:

My name Tathagata Ghosh

Enter 1: To insert a sub-string in to given main string from a given position

Enter 2: To delete n characters from a given position in the given string

Enter your choice:

1

Enter the substring to insert:

is

Enter the position from where you want to insert to insert:

7

New string is: My nameis Tathagata Ghosh

2.

Enter a string:

hellow everyone

Enter 1: To insert a sub-string in to given main string from a given position

Enter 2: To delete n characters from a given position in the given string

Enter your choice:

2

Enter number of characters to delete: 1

Enter the position from which to delete: 4

New string is: hellw everyone

```
/*Programming Laboratory Assignment 2021
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/* Q3. 2’s complement of a number is obtained by scanning it from right to lef
t and
complementing all the bits after the first appearance of a 1. Thus 2's complem
ent of
11100 is 00100. Write a C program to find the 2's complement of a binary numbe
r.*/
```

```c
#include <stdio.h>

int main()
{
    int n;

    printf("Enter a decimal number: \n");
    scanf("%d", &n);

    int nbits = 0;
    int x = n;
    while (n  > 0)
    {
        n = n / 2;
        nbits++;
    }
    //printf("%d", nbits);

    int i = nbits - 1;
    int bin[nbits];
    while (x > 0)
    {
        int rem = x % 2;
        bin[i] = rem;
        x = x / 2;
        i--;
    }

    printf("Binary Equivalent is: ");

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

    printf("\n");

    int f = 0;
    int comp[nbits];
    for (int i = nbits - 1; i >= 0; i--)
    {
        if (f == 0)
        {
            comp[i] = bin[i];
            if (bin[i] == 1)
            {
                f = -1;
```

```
                continue;
            }
        }
        if (f == -1)
        {
            comp[i] = !bin[i];
        }
    }

    printf("2's Complement is: ");
    for (int i = 0; i < nbits; i++)
    {
        printf("%d", comp[i]);
    }
    printf("\n");
    return 0;
}
```

OUTPUT :-

1.

Enter a decimal number:

25

Binary Equivalent is: 11001

2's Complement is: 00111

2.

Enter a decimal number:

44

Binary Equivalent is: 101100

2's Complement is: 010100

Github: https://github.com/Tathagata-Ghosh-Developer/Lab-Assignment-3rd-Semester