Gebze Teknik Üniversitesi

Bilgisayar Mühendisliği Bölümü

BİL 107 - Bilgisayar Bilimlerine Giriş Laboratuvarı
Lab 9

Lab Work:

1. Strings in C

Print your name and surname.

```
#include<stdio.h>

int main()
{
    char name[] = "Nur Banu", surname[] = "Albayrak";
    printf("My name is %s and surname is %s.\n", name, surname);
 }
```

2. Strings in C

Get name and surname from the user and print on screen.

```
#include<stdio.h>

int main()
{
    char name[20], surname[20];
    printf("Enter your name:");
    scanf("%s", name);
    printf("Enter your surname:");
    scanf("%s", surname);
    printf("Hello %s %s.\n", name, surname);
}
```

3. Strings and Command Line Arguments

Get names of the students in a class as command line arguments. Print the names on screen.

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

int main(int argc, char *argv[])
{
    char names[100][100];
    int count = 0;
    for(int i = 0; i < argc - 1; i++)
    {
        strcpy(names[i], argv[i + 1]);
        count += 1;
    }
    printf("There are %d students. And their names are:\n", count);
    for(int i=0; i < argc; i++)
    {
        printf("%s\n", names[i]);
    }
}
```

4. Recursion

Write a recursive function and obtain the total of numbers up to a given number.

```
#include<stdio.h>

int sum_up_to(int);

int main()
{
    int number, sum;

    printf("Please enter a number:");
    scanf("%d", &number);

    sum = sum_up_to(number);
    printf("The sum of numbers up to %d is %d.\n", number, sum);
}

int sum_up_to(int num)
{
    if(num == 0)
    {
        return num;
    }
    else
    {
        return num + sum_up_to(num - 1);
    }
}
```

5. Recursion and strings

Write a recursive function that prints reverse of a given string. Get a string from the user and print reverse of the string.

```
#include<stdio.h>

void print_reverse(char str[]);

int main()
{
    char str[100];

    printf("Enter a string:");
    scanf("%s", str);

    printf("Reverse of the string is: ");
    print_reverse(str);
    printf("\n");
}

void print_reverse(char str[])
{
    if(str[0] != '\0')
    {
        print_reverse(str + 1);
    }
    printf("%c", str[0]);
}
```

Lab Quiz

(For each question, 0 point if nothing is working, 1 point if working but not properly, 2 points if working properly)

1. Write the reverse_string() function for the given code below. (Hint: use strlen() function which gives the length of a string.)

```
#include<stdio.h>
#include<string.h>
void reverse_string(char str[]);

int main()
{
    char str_arr[100];

    printf("Enter a string:");
    scanf("%s", str_arr);
    reverse_string(str_arr);
    printf("Reversed string is: %s \n", str_arr);
}

void reverse_string(char str[])
{
    int i = 0;
    int j = strlen(str) - 1;
    while(i < j)
    {
        char temp = str[i];
        str[i] = str[j];
        str[j] = temp;
        i++;
        j--;
    }
}
```

2. Write print_line(), print_histogram() and len() functions for the given code below.
print_line() : Prints **<int num_of_chars>** times **<char c>** character.
print_histogram() : Prints a histogram of **<int values[]>** with **<char c>** using print print_line() and len() functions.
len(): Returns the length of **<int array[]>**.

```
#include<stdio.h>
void print_histogram(char c, int vals[]);
int len(int arr[]);

int main()
{
    int values[100], val=1, count=0;
    printf("Enter positive values. Enter a negative value to print the
histogram.\n");
    do
    {
        printf("Enter a value:");
        scanf("%d", &val);
        values[count] = val;
        count++;
    }while(val > 0);
    print_histogram('*', values);
}

void print_line(char c, int num_of_chars)
{
    for(int i=0; i<num_of_chars; i++)
    {
        printf("%c", c);
    }
    printf("\n");
}

void print_histogram(char c, int values[])
{
    for(int i = 0; i<len(values); i++)
    {
        print_line(c, values[i]);
    }
}

int len(int array[])
{
    int len=0, i=0;
    while(array[i]>0)
    {
        len++;
        i++;
    }
    return len;
}
```

Sample:

Enter positive values. Enter a negative value to print the histogram.
Enter a value:
3
Enter a value:
5
Enter a value:
6

Enter a value:
2
Enter a value:
-1
Output:
****
****
****
******