

Data Structures and Algorithms

Lab Report

Lab05



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Class	Data Structures and Algorithms CSC211 (BCE-3B)
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Pre-Lab Task

Task:1

Implement the peek function to familiarize yourself with this implementation of stack.

Solution:

The code is shown below,

```
struct element peek(struct node * top)
{
    struct element temp = top->data ; /// I copy the data at the top node into a temporary variable

    return(temp);
}
```

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab05\bin\Debug\Lab05.exe

The data popped is 20
The data popped is 30
The data popped is 10

The Revered data popped is:
The Revered data popped is 10
The Revered data popped is 30
The Revered data popped is 20

after revering:
10
30
20

Now Peeking the Top of array..
top is: 20

Enter String to test is it is balanced or not:
```

=====

In Lab Tasks

Task:1


Reversing an array of numbers.

Solution:

The code is shown below,

```
void reverse_num_array(int * num_array)
|{
|  struct node * ptr=NULL;
|  for(int i=0;i<3;i++)
|  |{
|
|    struct element data;
|    data.d=*(num_array+i);
|    data.d_type=0;
|    push(&ptr,data);
|  }
|  printf("\n\nThe Reversed data popped is:\n");
|  for(int j = 0; j<3; j++)
|  |{
|
|    struct element templ;
|
|    templ = pop(&ptr);
|
|    if(templ.d_type == 0)
|    |{
|    |  printf("The Reversed data popped is %d\n", templ.d);
|    |}
|    else
|    |printf("\nThe data popped is %c", templ.ch);
|    }
|  }
|  printf("\n\nafter revering:\n");
|  for(int a=2; a>=0;a--)
|  |{
|  |  printf("%d\n",*(num_array+a));
|  |}
|  }
|}
```

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab05\bin\Debug\Lab05.exe

The data popped is 20
The data popped is 30
The data popped is 10

The Revered data popped is:
The Revered data popped is 10
The Revered data popped is 30
The Revered data popped is 20

after revering:
10
30
20

Now Peeking the Top of array..
top is: 20

Enter String to test is it is balanced or not:
```

=====

Task:2

Testing if a mathematical expression is balanced or not.

Solution

The code is shown below,

```

int isBalanced(char * ptr_array)
{
    int i=0;
    int count = 0;
    while (*(ptr_array+i) != '\0')
    {
        if (*(ptr_array+i) == '}')
            count--;
        if (*(ptr_array+i) == '{')
            count++;
        if (*(ptr_array+i) == ')')
            count--;
        if (*(ptr_array+i) == '(')
            count++;

        i++;
    }
    if (count < 0 || count > 0)
    {
        printf("\nInvalid");
    }
    if (count == 0)
        printf("\nValid");
    return 0;
}

```

The Result of the following code is attached below:

```

C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab05\bin\Debug\Lab05.exe
The data popped is 20
The data popped is 30
The data popped is 10

The Revered data popped is:
The Revered data popped is 10
The Revered data popped is 30
The Revered data popped is 20

after revering:
10
30
20

Now Peeking the Top of array..
top is: 20

Enter String to test is it is balanced or not:
(3+3)
Valid
Process returned 0 (0x0)   execution time : 169.200 s
Press any key to continue.

```

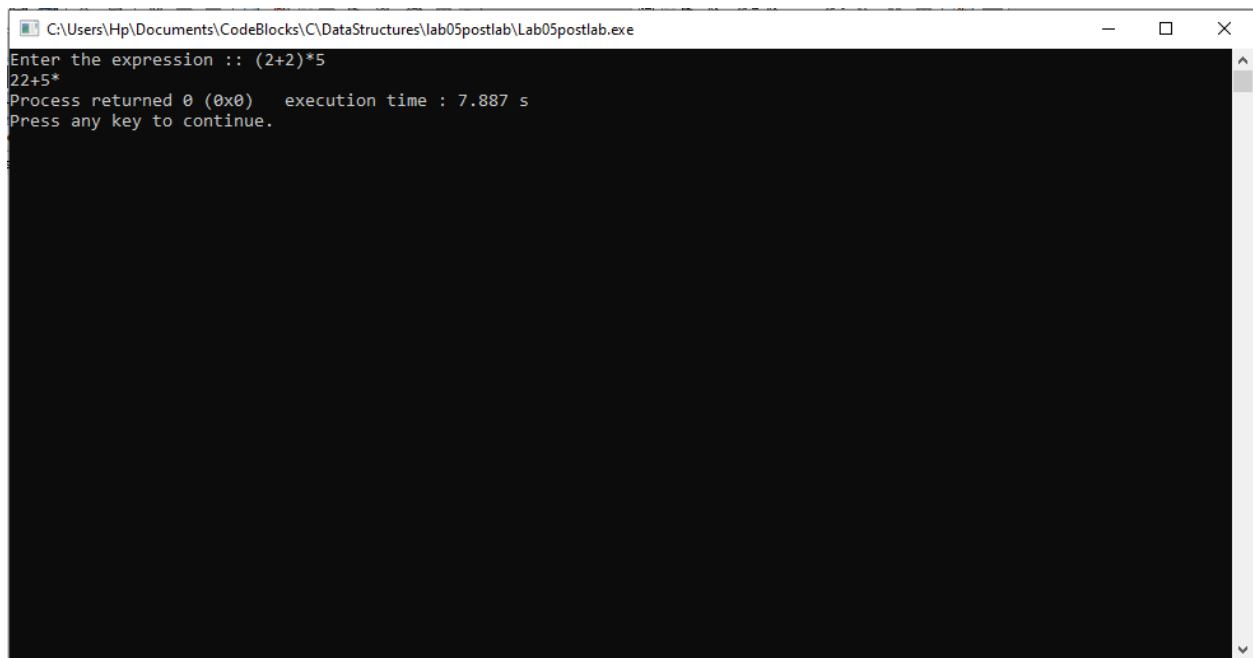
POST LAB

Question no:3

Infix to postfix conversion

Solution

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\lab05postlab\Lab05postlab.exe
Enter the expression :: (2+2)*5
22+5*
Process returned 0 (0x0) execution time : 7.887 s
Press any key to continue.
```

THE END