Indian Institute of Information Technology Sri City, Chittoor

(An Institute of National Importance under An Act of Parliament)

Name: **DSA Lab - 8** Duration: **3 Hrs**

Date: **3rd June, 2021** Maximum Marks: **10**

INSTRUCTIONS:

1. Please carefully read all assignment problems and complete the function prototypes given to solve the problems. Do not change the function prototypes.

2. Write only a single main function. You can call the required functions from the main function with static input or input provided by the user. Do not ask for any user input within the functions.

3. Name the file as follows: S2020xxxxx_A8.c

4. DO NOT zip. Upload a single .c file directly to your submission in the common Google classroom.

If you do not follow the above-mentioned instructions, a suitable penalty would be imposed.

ASSIGNMENT PROBLEMS

1. Write a function to build a Binary Search Tree. The function should take as arguments an array containing n elements. The function should then construct a BST by inserting the elements in the array one by one into an empty BST (starting from index 0). The function should return the root pointer of the tree. Also, write a function to print the inorder traversal of a tree. The function should take as input the root pointer of the tree and print the inorder traversal of the tree. **[2+1=3 marks]**

```
struct BST_node

{

        int data;

        struct BST_node * lchild;

        struct BST node * rchild;

};

struct BST_node * construct_BST (int arr[], int n, struct BST_node * root)

{

return root;

}
```

```
void print_tree(struct BST_node * root)

{



}
```

2. Write a function to delete a node from a BST. The function should take two arguments - a root pointer to the BST and an integer value denoting the data to be deleted from the BST. The function should delete the required element and finally return the root pointer. **[4 marks]**

```
struct BST_node * delete_BST(struct BST_node * root, int data)

{

}
```

3. Write a function BST_height which returns an integer value denoting the height of a BST passed to it. The function takes as input a pointer to the root of the BST and returns an integer value. Note that the height of a tree with a single node is taken as 0. **[3 marks]**

```
int BST_height (struct BST_node * root)

{

}
```