BST

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#include <stdlib.h>
#include <stdio.h>
struct tree
{
   int info;
   struct tree *left;
   struct tree *right;
};
struct tree *insert(struct tree *, int);
void inorder(struct tree *);
void postorder(struct tree *);
void preorder(struct tree *);
struct tree *delet(struct tree *, int);
struct tree *search(struct tree *);
int main(void)
{
   struct tree *root;
   int choice, item, item_no;
   root = NULL;
   /* rear = NULL;*/
   do
   {
```

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do
{
   printf("\n \t 1. Insert in Binary Tree ");
   printf("\n\t 2. Delete from Binary Tree ");
   printf("\n\t 3. Inorder traversal of Binary tree");
   printf("\n\t 4. Search");
   printf("\n\t 5. Exit ");
   printf("\n\t Enter choice : ");
   scanf(" %d", &choice);
   if (choice < 1 || choice > 7)
      printf("\n Invalid choice - try again");
} while (choice < 1 || choice > 7);
switch (choice)
{
case 1:
   printf("\n Enter new element: ");
   scanf("%d", &item);
   root = insert(root, item);
   printf("\n root is %d", root->info);
   printf("\n Inorder traversal of binary tree is : ");
   inorder(root);
   break;
case 2:
   printf("\n Enter the element to be deleted : ");
   scanf(" %d", &item_no);
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            root = delet(root, item_no);
            inorder(root);
            break;
        case 3:
            printf("\n Inorder traversal of binary tree is : ");
            inorder(root);
            break;
        case 4:
            printf("\n Search operation in binary tree ");
            root = search(root);
            break;
        default:
            printf("\n End of program ");
        }
    } while (choice != 5);
    return (0);
}
struct tree *insert(struct tree *root, int x)
{
    if (!root)
    {
        root = (struct tree *)malloc(sizeof(struct tree));
        root->info = x;
        root->left = NULL;
        root->right = NULL;
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        return (root);
    }
    if (root->info > x)
        root->left = insert(root->left, x);
    else
    {
        if (root->info < x)
            root->right = insert(root->right, x);
    }
    return (root);
}
void inorder(struct tree *root)
{
    if (root != NULL)
    {
        inorder(root->left);
        printf(" %d", root->info);
        inorder(root->right);
    }
    return;
}
struct tree *delet(struct tree *ptr, int x)
{
    struct tree *p1, *p2;
    if (!ptr)
```

```
{
   printf("\n Node not found ");
   return (ptr);
}
else
{
   if (ptr->info < x)
   {
      ptr->right = delet(ptr->right, x);
      /*return(ptr);*/
   }
   else if (ptr->info > x)
   {
      ptr->left = delet(ptr->left, x);
      return ptr;
   }
   else
   {
      if (ptr->info == x)
      {
         if (ptr->left == ptr->right)
         {
            free(ptr);
            return (NULL);
         }
```

```
        else if (ptr->left == NULL)
        {
           p1 = ptr->right;
           free(ptr);
           return p1;
        }
        else if (ptr->right == NULL)
        {
           p1 = ptr->left;
           free(ptr);
           return p1;
        }
        else
        {
           p1 = ptr->right;
           p2 = ptr->right;
           while (p1->left != NULL)
              p1 = p1->left;
           p1->left = ptr->left;
           free(ptr);
           return p2;
        }
      }
   }
}
```

```
    return (ptr);
}
struct tree *search(struct tree *root)
{
    int no, i, ino;
    struct tree *ptr;
    ptr = root;
    printf("\n Enter the element to be searched :");
    scanf(" %d", &no);
    fflush(stdin);
    while (ptr)
    {
        if (no > ptr->info)
            ptr = ptr->right;
        else if (no < ptr->info)
            ptr = ptr->left;
        else
            break;
    }
    if (ptr)
    {
        printf("\n Element %d which was searched is found and is = %d", no, ptr -> info);
    }
    else
        printf("\n Element %d does not exist in the binary tree", no);
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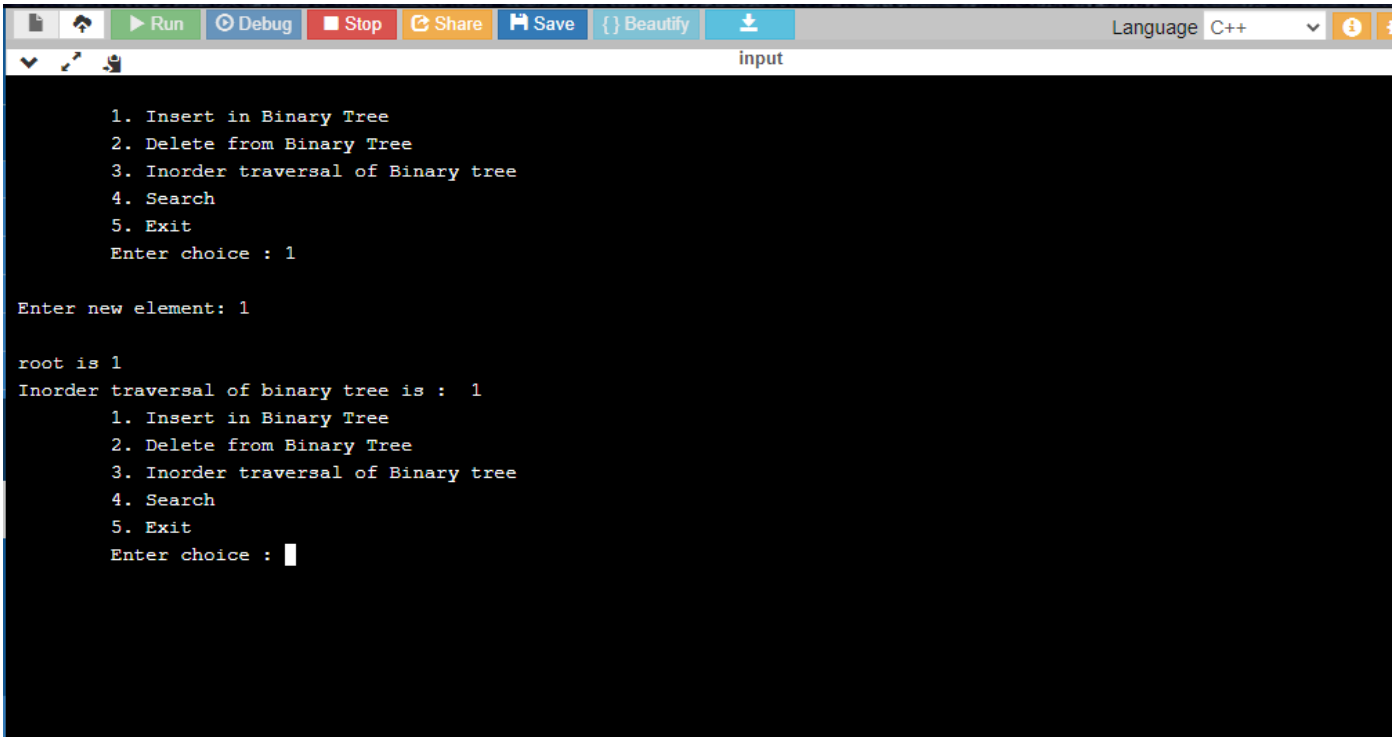
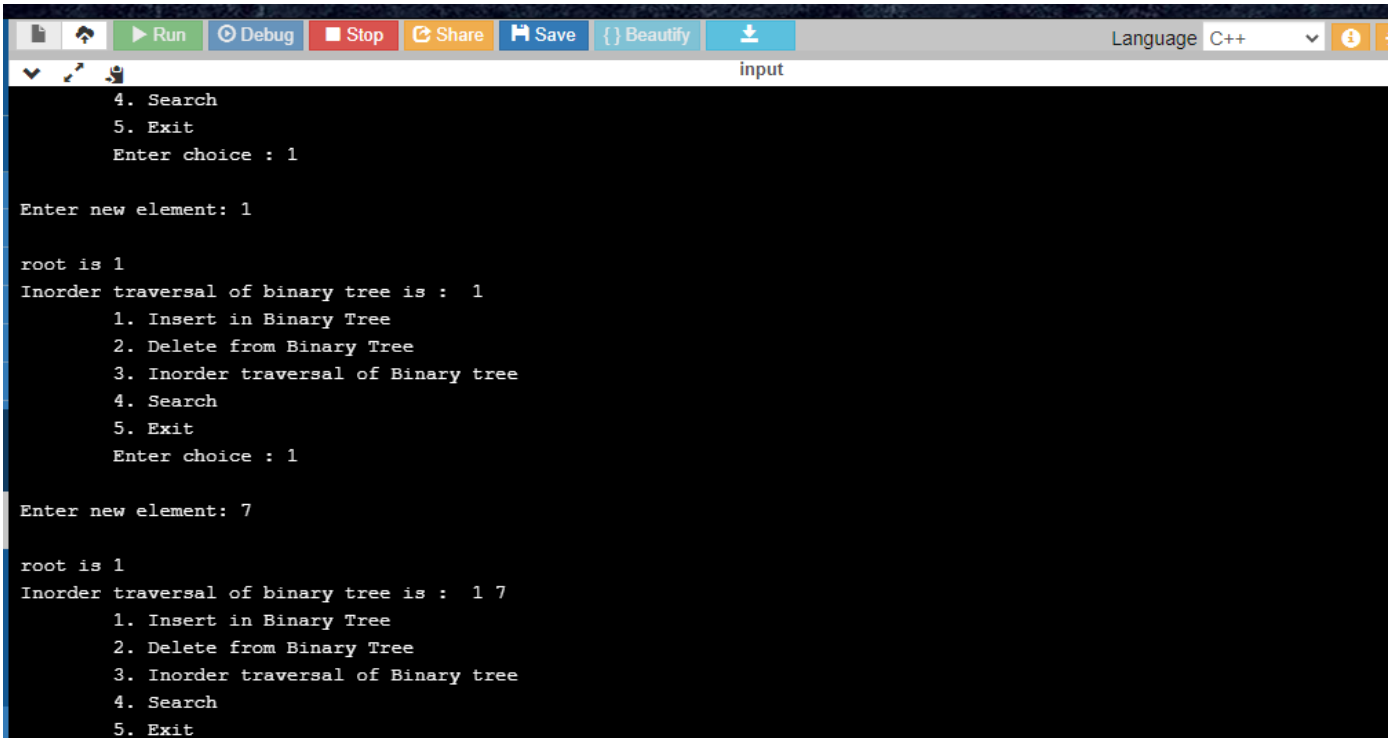
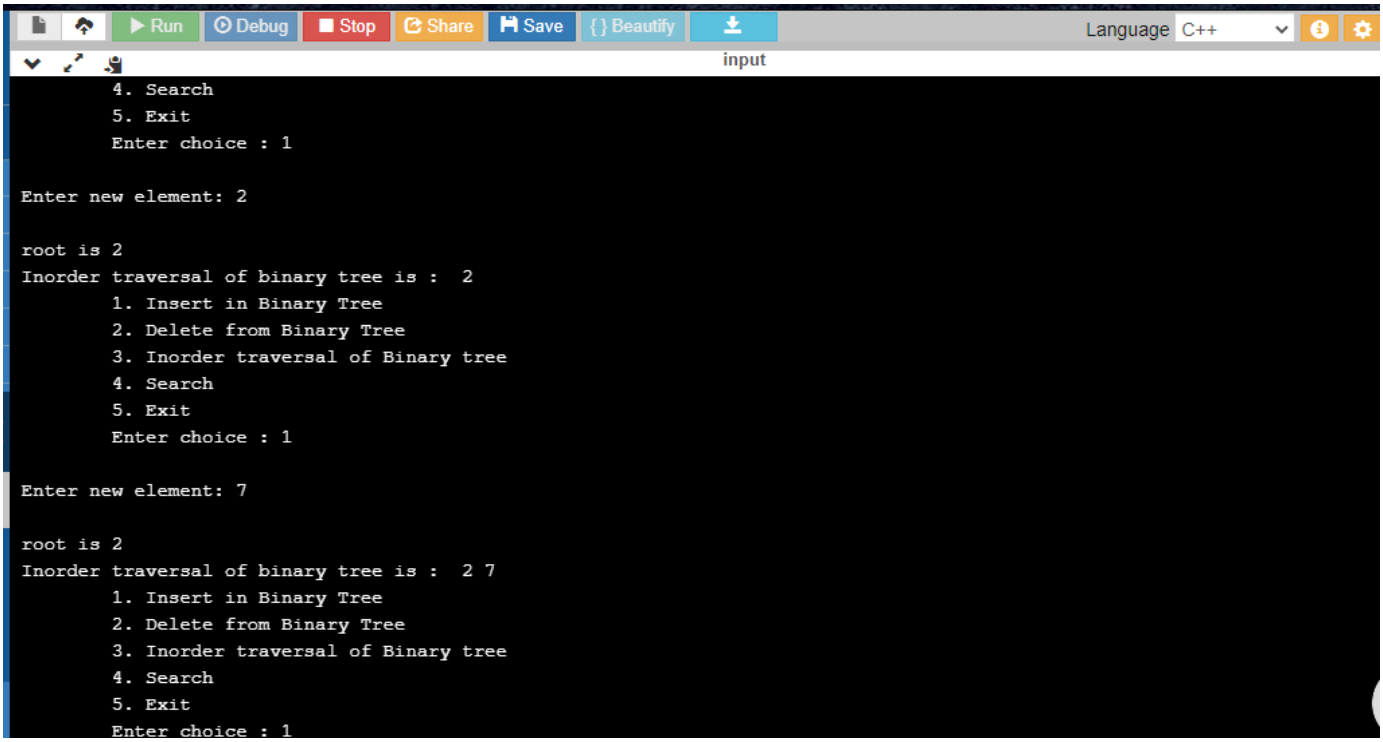
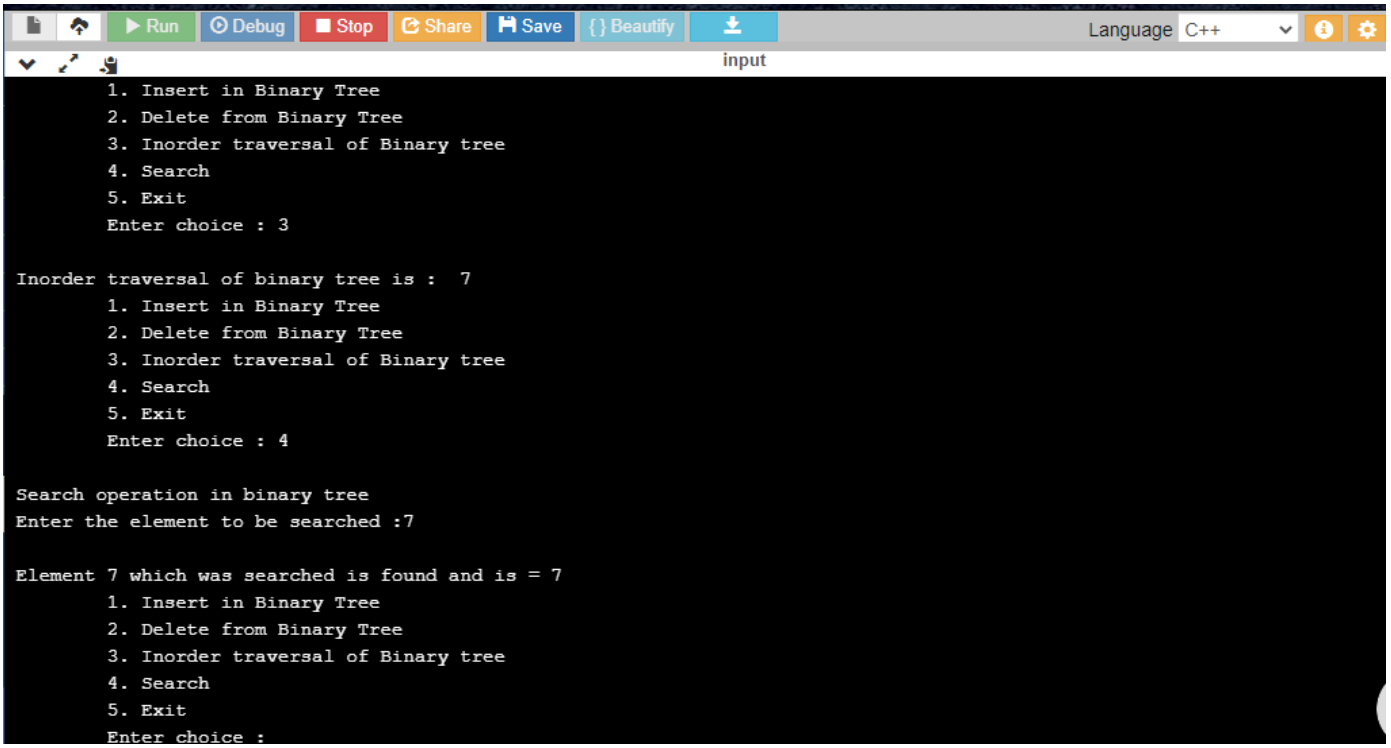
```
    return (root);
}
```


Run
Debug
Stop
Share
Save
{ } Beautify
Language C++
input
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice : 1
Enter new element: 1
root is 1
Inorder traversal of binary tree is : 1
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice :


Run
Debug
Stop
Share
Save
{ } Beautify
Language C++
input
4. Search
5. Exit
Enter choice : 1
Enter new element: 1
root is 1
Inorder traversal of binary tree is : 1
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice : 1
Enter new element: 7
root is 1
Inorder traversal of binary tree is : 1 7
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit


Run
Debug
Stop
Share
Save
{} Beautify
Language C++
input
4. Search
5. Exit
Enter choice : 1
Enter new element: 2
root is 2
Inorder traversal of binary tree is : 2
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice : 1
Enter new element: 7
root is 2
Inorder traversal of binary tree is : 2 7
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice : 1


Run
Debug
Stop
Share
Save
{} Beautify
Language C++
input
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice : 3
Inorder traversal of binary tree is : 7
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice : 4
Search operation in binary tree
Enter the element to be searched :7
Element 7 which was searched is found and is = 7
1. Insert in Binary Tree
2. Delete from Binary Tree
3. Inorder traversal of Binary tree
4. Search
5. Exit
Enter choice :