

Design and Analysis of Algorithms

Week-5

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Binary Search Tree:

Code:

```
//CH.SC.U4CSE24129

#include <stdio.h>

#include <stdlib.h>

struct node {
    int data;
    struct node *left;
    struct node *right;
};

struct node* create(int value) {
    struct node* n;
    n = (struct node*)malloc(sizeof(struct node));
    n->data = value;
    n->left = NULL;
    n->right = NULL;
    return n;
}

void inorder(struct node *root) {
    if (root != NULL) {
        inorder(root->left);
        printf("%d ", root->data);
    }
}
```

```

        inorder(root->right);
    }
}

void preorder(struct node *root) {
    if (root != NULL) {
        printf("%d ", root->data);
        preorder(root->left);
        preorder(root->right);
    }
}

void postorder(struct node *root) {
    if (root != NULL) {
        postorder(root->left);
        postorder(root->right);
        printf("%d ", root->data);
    }
}

int main() {
    struct node *root = create(122);
    root->left = create(111);
    root->right = create(147);
    root->left->left = create(110);
    root->left->right = create(112);
    root->left->right->right = create(117);
    root->right->left = create(133);
    root->right->right = create(154);
    root->right->left->left = create(123);
    root->right->left->right = create(141);
    root->right->right->left = create(149);
}

```

```

root->right->right->right = create(157);
printf("Inorder Traversal:\n");
inorder(root);
printf("\n\nPreorder Traversal:\n");
preorder(root);
printf("\n\nPostorder Traversal:\n");
postorder(root);
return 0;
}

```

Output:

```

Inorder Traversal:
110 111 112 117 122 123 133 141 147 149 154 157

Preorder Traversal:
122 111 110 112 117 147 133 123 141 154 149 157

Postorder Traversal:
110 117 112 111 123 141 133 149 157 154 147 122
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```

