

Institute of Computer Technology
B. Tech. Computer Science and Engineering
Sub: DS
Course Code: 2CSE302

Practical – 13

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Sem - 3
Branch: CS
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Problem Definition-1: To understand the concept of binary tree implementation: Create following mentioned tree and display the elements using any traversal algorithm (in order, pre order, post order)

Code:

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

typedef struct Node {
    int data;
    struct Node* left;
    struct Node* right;
} Node;

Node* createNode(int data) {
    Node* newNode = (Node*)malloc(sizeof(Node));
    newNode->data = data;
    newNode->left = newNode->right = NULL;
    return newNode;
}

void inOrder(Node* root) {
    if (root == NULL) return;
```

```
    inOrder(root->left);
    printf("%d ", root->data);
    inOrder(root->right);
}

void preOrder(Node* root) {
    if (root == NULL) return;

    printf("%d ", root->data);
    preOrder(root->left);
    preOrder(root->right);
}

void postOrder(Node* root) {
    if (root == NULL) return;

    postOrder(root->left);
    postOrder(root->right);
    printf("%d ", root->data);
}

int main() {
    Node* root = createNode(4);
    root->left = createNode(2);
    root->right = createNode(3);
    printf("In-order Traversal: ");
    inOrder(root);
    printf("\n");
    printf("Pre-order Traversal: ");
    preOrder(root);
    printf("\n");
    printf("Post-order Traversal: ");
    postOrder(root);
    printf("\n");
    return 0;
}
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SERIAL MONITOR  COMMENTS
● PS C:\ICT\SEM-3\DS\Practical> cd 'c:\ICT\SEM-3\DS\Practical\Practical-13\output'
● PS C:\ICT\SEM-3\DS\Practical\Practical-13\output> & .\'main.exe'
In-order Traversal: 2 4 3
Pre-order Traversal: 4 2 3
Post-order Traversal: 2 3 4
○ PS C:\ICT\SEM-3\DS\Practical\Practical-13\output> 
```