lab-8 19/02/2024

1) write a program to create BST and traversals (inorder, preorder & postorder).

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

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

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

struct Node * insert(struct Node *root,
                     int data){
    if(root == NULL){
        return createNode(data);
    }
    if(data < root->data){
        root->left = insert(root->left, data);
    }
    else if(data > root->data){
        root->right = insert(root->right,
                             data);
    }
    return root;
}
```

```
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);
    }
}

void display(struct Node *root){
    printf("InOrder traversal: ");
    inorder(root);
    printf("\nPreOrder traversal: ");
    preOrder(root);
    printf("\nPostOrder traversal: ");
    postOrder(root);
}   printf("\n");
```

```
int main(){
    struct Node *root=NULL;
    int data,c;
    printf("1. Enter data into BST \n2.
                    To stop\n");
    while(1){
        printf("Enter choice: ");
        scanf("%d",&c);
        switch(c){
            case 1:
                printf("Enter data: ");
                scanf("%d",&data);
                root = insert(root,data);
                Break;
            case 2:
                display(root);
                exit(0);
        }
    }
    return 0;
}
```

BST - Leetcode

NLP
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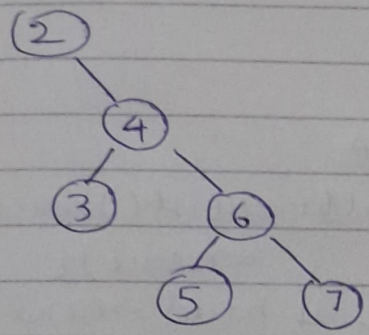
Output:

```
1. Enter data into BST
2. To stop
Enter choice: 1
Enter data: 2
Enter choice: 1
Enter data: 5
Enter choice: 1
Enter data: 7
Enter choice: 1
```

Enter data: 4
Enter choice: 1
Enter data: 21
Enter choice: 2
PreOrder traversal: 2 1 5 4 7 6
InOrder traversal: 1 2 4 5 6 7
PostOrder traversal: 1 4 6 7 5 2



Leetcode

1) Delete the middle Node of a Linked list

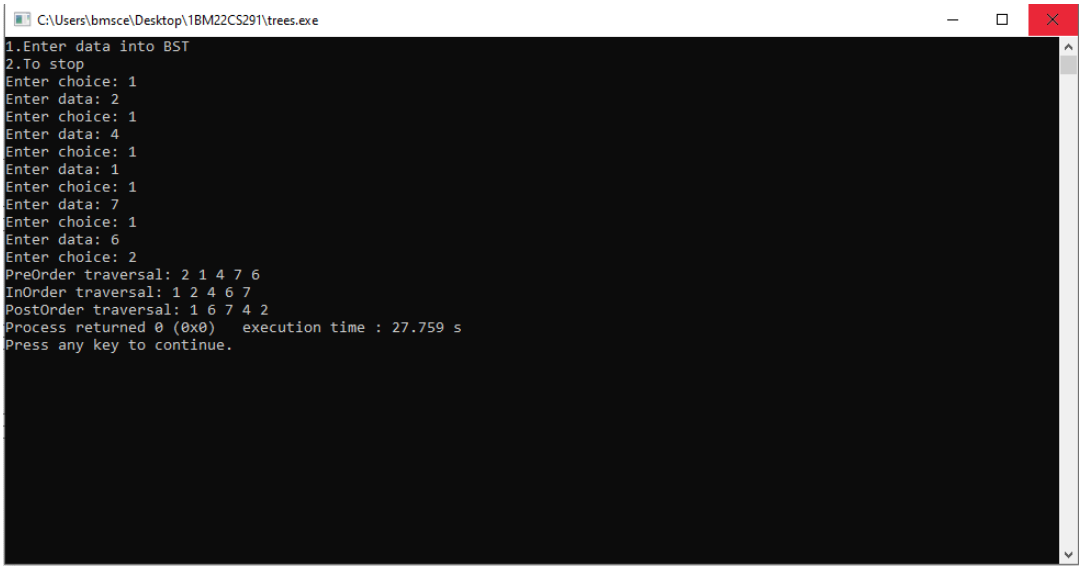
```
struct ListNode *deleteMiddle(struct ListNode
                              *head){
    int count=0;
    struct ListNode *ptr;
    ptr = head;
    while(ptr!=NULL){
        count++;
        ptr = ptr->next;
    }
    int mid = count/2;
    struct ListNode *prev=NULL;
    ptr= head;
    if(head->next==NULL){
        head = NULL;
        return head;
    }
```

```
if(head->next==NULL){
for(int i=0;i<mid;i++){
        prev=ptr;
        ptr=ptr->next;
}
prev->next=ptr->next;
free(ptr);
return head;
}
```

2) odd even linked list

```
struct ListNode* oddEvenList(struct ListNode
                             *head){
    if(head==NULL || head->next==NULL){
        return head;
    }
    struct ListNod* oddHead=head;
    struct ListNode* evenHead=head->next;
    struct ListNode* odd=oddHead;
    struct ListNode* even=evenHead;
    while(even!=NULL && even->next!=NULL){
        odd->next=even->next;
        odd=odd->next;
        even->next=odd->next;
        even=even->next;
    }
    odd->next=evenHead;
    return head;
}
```

Output:


C:\Users\bmsce\Desktop\1BM22CS291\trees.exe
1.Enter data into BST
2.To stop
Enter choice: 1
Enter data: 2
Enter choice: 1
Enter data: 4
Enter choice: 1
Enter data: 1
Enter choice: 1
Enter data: 7
Enter choice: 1
Enter data: 6
Enter choice: 2
PreOrder traversal: 2 1 4 7 6
InOrder traversal: 1 2 4 6 7
PostOrder traversal: 1 6 7 4 2
Process returned 0 (0x0)   execution time : 27.759 s
Press any key to continue.