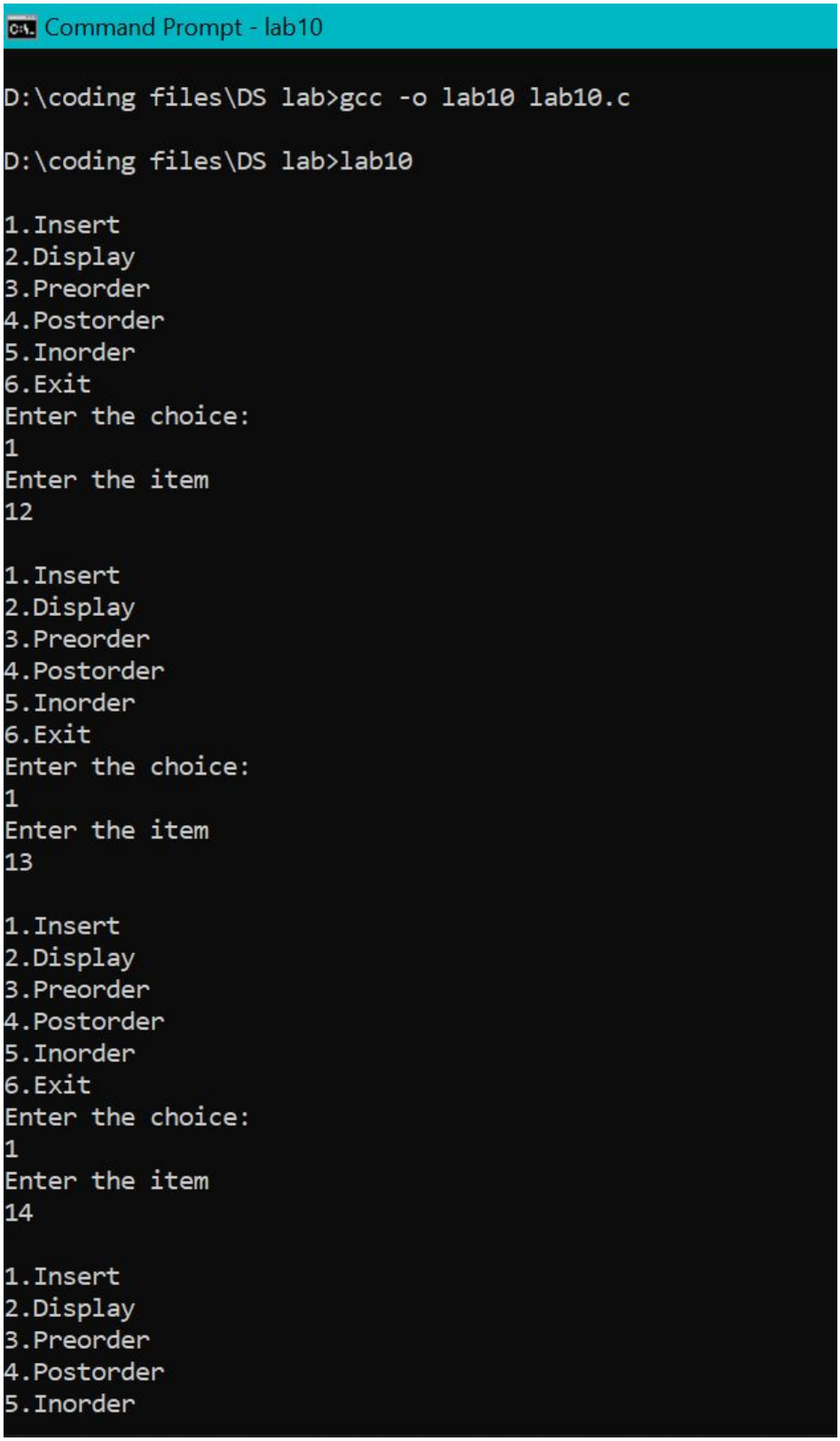
LAB-10

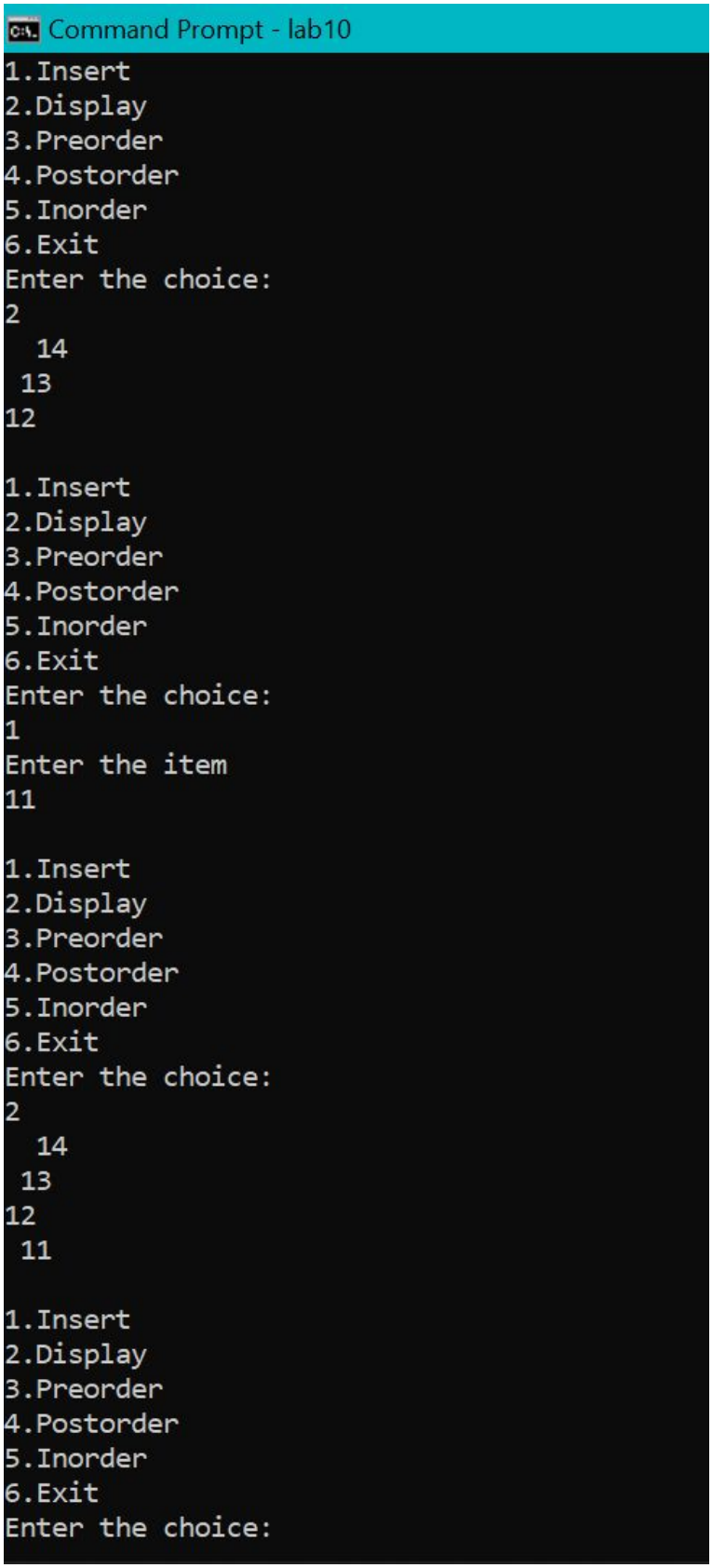
Write a program
a) To construct a binary Search tree.
b) To traverse the tree using all the methods i.e., in-order, preorder and post order
c) To display the elements in the tree

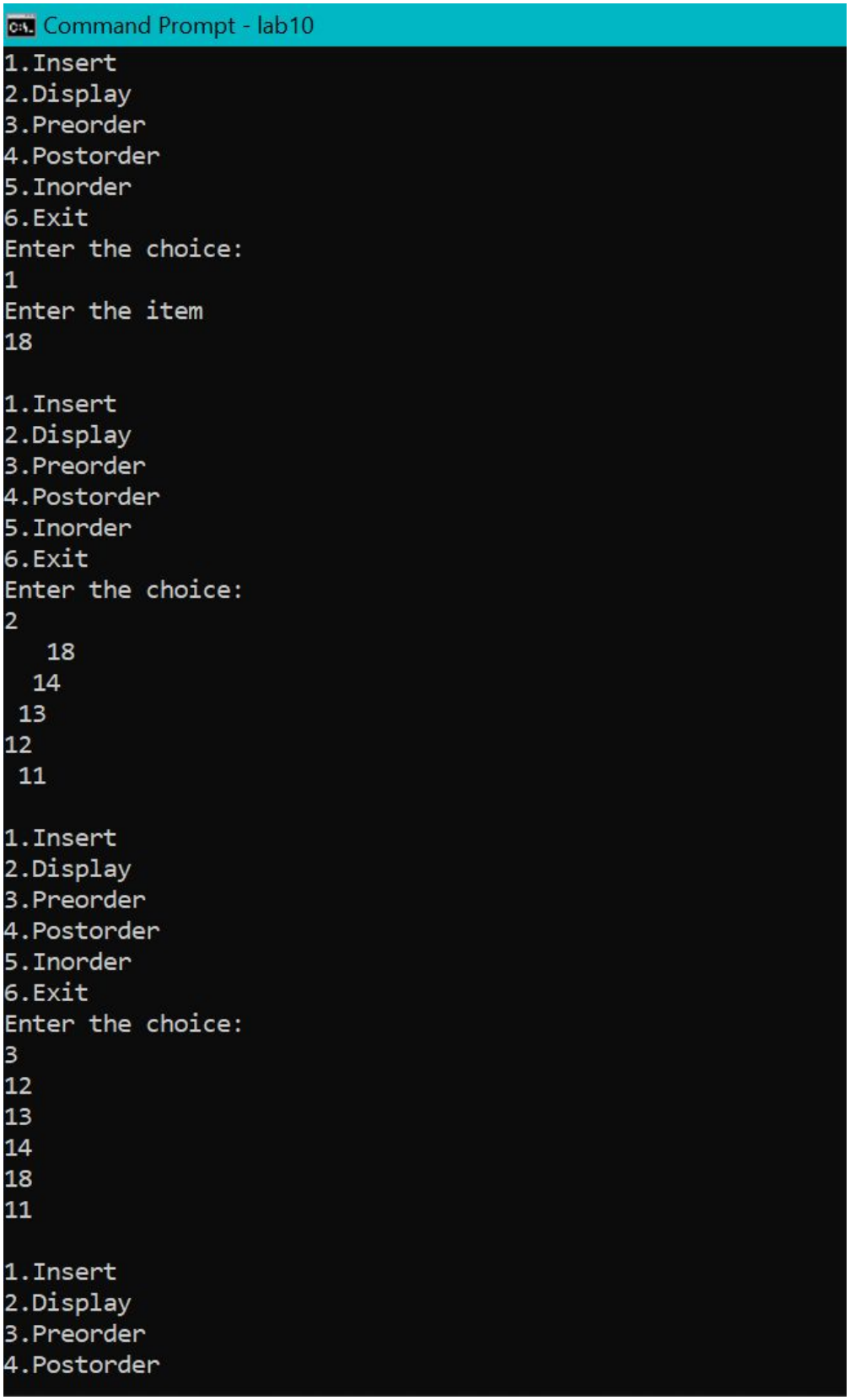
```
#include<stdio.h>
#include<stdlib.h>
struct node{
  int info;
  struct node *rlink,*llink;
};
typedef struct node* NODE;
NODE getnode(){
  NODE x;
  x = (NODE)malloc(sizeof(struct node));
  if(x == NULL){
    printf("Memory full\n");
    exit(0);
  }
  return x;
}

void freenode(NODE x){
  free(x);
}
NODE insert(NODE root, int item){
  NODE temp,cur,prev;
  temp = getnode();
  temp -> rlink = NULL;
  temp -> llink = NULL;
  temp -> info = item;
  if(root == NULL)
    return temp;
  prev = NULL;
  cur = root;
  while(cur != NULL){
    prev = cur;
```

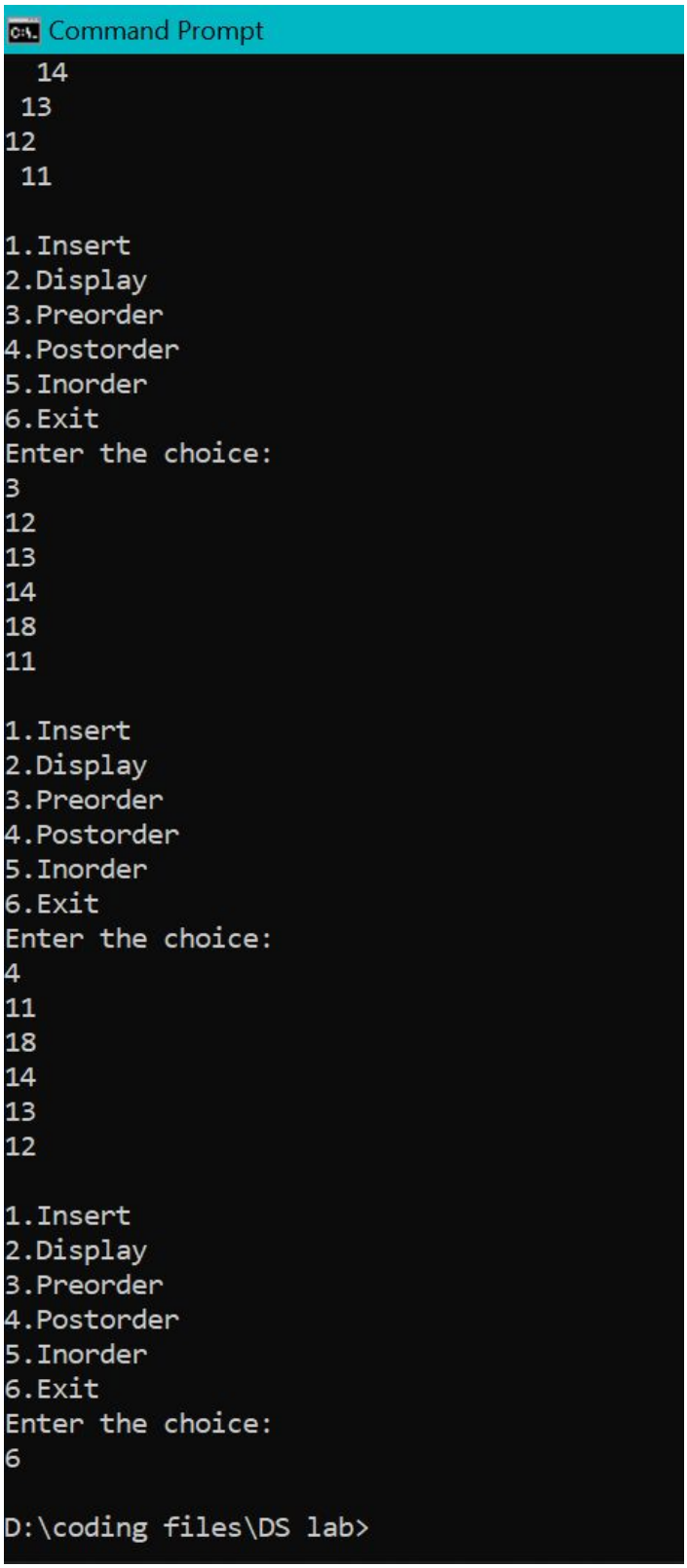
```
    cur =(item<cur->info)?cur->llink:cur->rlink;
  }
  if(item<prev->info)
    prev -> llink = temp;
  else
    prev ->rlink = temp;
  return root;
}
void display(NODE root,int i){
  int j;
  if(root != NULL){
    display(root->rlink,i+1);
    for(j=0;j<i;j++)
      printf(" ");
    printf("%d\n",root->info);
    display(root->llink,i+1);
  }
}
void preorder(NODE root){
  if(root!=NULL){
    printf("%d\n",root->info);
    preorder(root->rlink);
    preorder(root->llink);
  }
}
void postorder(NODE root){
  if(root!=NULL){
    postorder(root->llink);
    postorder(root->rlink);
    printf("%d\n",root->info);
  }
}
void inorder(NODE root){
  if(root != NULL){
    inorder(root->llink);
    printf("%d\n",root->info);
    inorder(root->rlink);
  }
}

int main(){
  int item,choice;
  NODE root = NULL;
  for(;;){
```

```
    printf("\n1.Insert\n2.Display\n3.Preorder\n4.Postorder\n5.Inorder\n6.Exit\n");
    printf("Enter the choice: \n");
    scanf("%d:",&choice);
    switch(choice){
      case 1: printf("Enter the item \n");
              scanf("%d",&item);
              root = insert(root,item);
              break;
      case 2: display(root,0);
              break;
      case 3: preorder(root);
              break;
      case 4: postorder(root);
              break;
      case 5: inorder(root);
              break;
      default: exit(0);
              break;
    }
  }
}
```


Command Prompt - lab10
D:\coding files\DS lab>gcc -o lab10 lab10.c
D:\coding files\DS lab>lab10
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
1
Enter the item
12
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
1
Enter the item
13
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
1
Enter the item
14
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder


Command Prompt - lab10
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
2
14
13
12
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
1
Enter the item
11
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
2
14
13
12
11
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:


Command Prompt - lab10
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
1
Enter the item
18
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
2
18
14
13
12
11
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
3
12
13
14
18
11
1.Insert
2.Display
3.Preorder
4.Postorder


Command Prompt
14
13
12
11
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
3
12
13
14
18
11
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
4
11
18
14
13
12
1.Insert
2.Display
3.Preorder
4.Postorder
5.Inorder
6.Exit
Enter the choice:
6
D:\coding files\DS lab>