

**NATIONAL UNIVERSITY OF COMPUTER AND
EMERGING SCIENCES
PROGRAM: SOFTWARE ENGINEERING**



DATA STRUCTURES LAB

LAB TASK-11

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Q1 CODE:

```
#include<iostream>

using namespace std;

class node
{
private:
int data;

node *left;

node *right;

public:
node(int data)
{
this->data=data;

left=nullptr;

right=nullptr;

}

friend class avl;

friend int main();

};

class avl
{
public:
node *left(node *A)
{
node *B=A->right;

node *trees=B->left;
```

```

B->left=A;
A->right=trees;
return B;
}
node *right(node *B)
{
node *A=B->left;
node *trees=A->right;
A->right=B;
B->left=trees;
return A;
}
node *rot_rl(node *root)
{
root->right=right(root->right);
return left(root);
}
node *rot_lr(node *root)
{
root->left=left(root->left);
return right(root);
}
void preorder(node *root)
{
if(root!=nullptr)
{
cout<<root->data<<" ";
preorder(root->left);

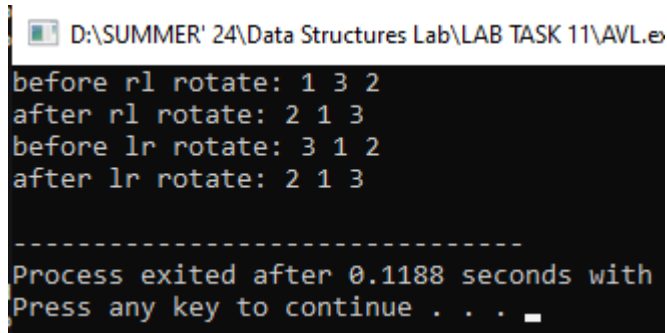
```

```
preorder(root->right);  
}  
}  
};
```

```
int main()  
{  
    avl t;  
    //      rl  
    node *rl=new node(1);  
    rl->right=new node(3);  
    rl->right->left=new node(2);  
    cout<<"before rl rotate: ";  
    t.preorder(rl);  
    cout<<endl;  
    rl=t.rot_rl(rl);  
    cout<<"after rl rotate: ";  
    t.preorder(rl);  
    cout<<endl;  
    //  lr  
    node *lr=new node(3);  
    lr->left=new node(1);  
    lr->left->right=new node(2);  
    cout<<"before lr rotate: ";  
    t.preorder(lr);  
    cout<<endl;  
    lr=t.rot_lr(lr);  
    cout<<"after lr rotate: ";
```

```
t.preorder(lr);  
  
cout<<endl;  
  
return 0;  
  
}
```

Output-01:



```
D:\SUMMER' 24\Data Structures Lab\LAB TASK 11\AVL.e  
before r1 rotate: 1 3 2  
after r1 rotate: 2 1 3  
before lr rotate: 3 1 2  
after lr rotate: 2 1 3  
  
-----  
Process exited after 0.1188 seconds with  
Press any key to continue . . .
```

