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: