递归函数转非递归

胡船长

初航我带你，远航靠自己

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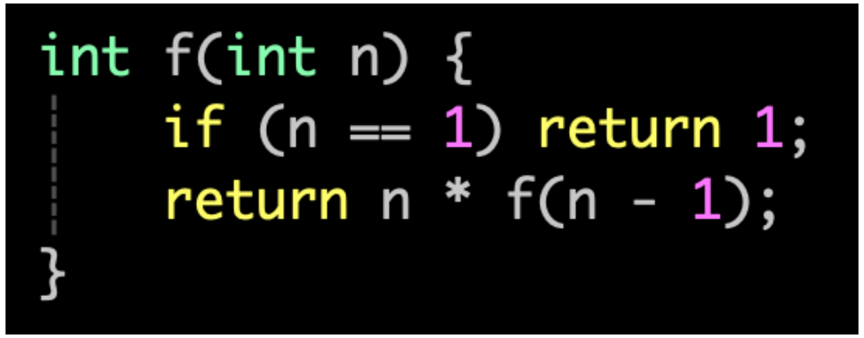
一. 系统栈模拟法

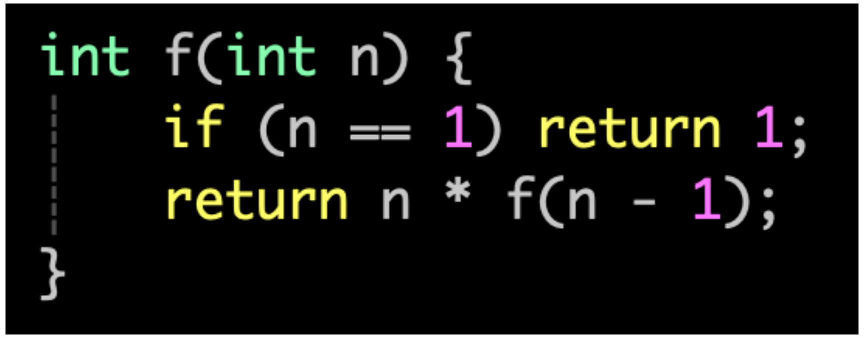
用栈模拟递归函数



```
int f(int n) {
    if (n == 1) return 1;
    return n * f(n - 1);
}
```

系统栈

用栈模拟递归函数



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    if (n == 1) return 1;
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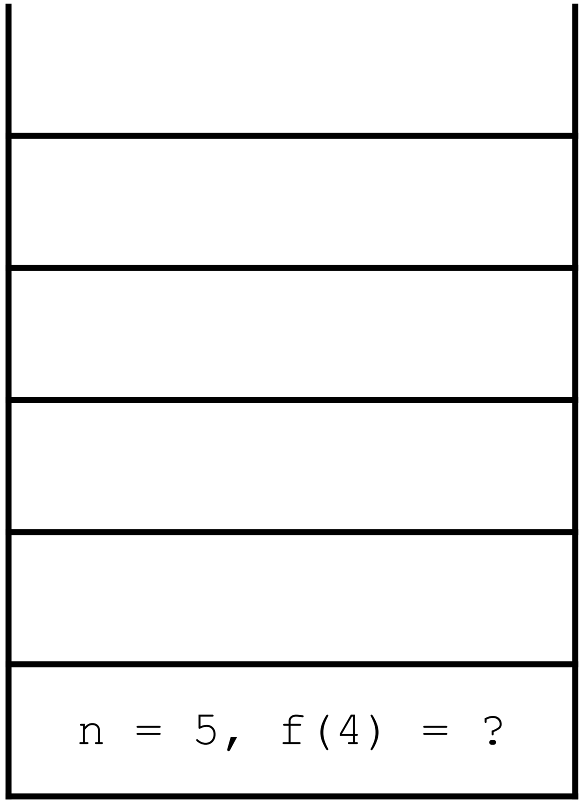
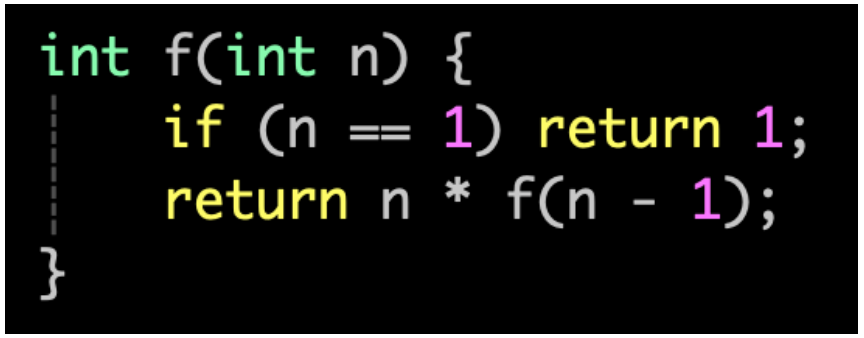


系统栈

用栈模拟递归函数



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    if (n == 1) return 1;
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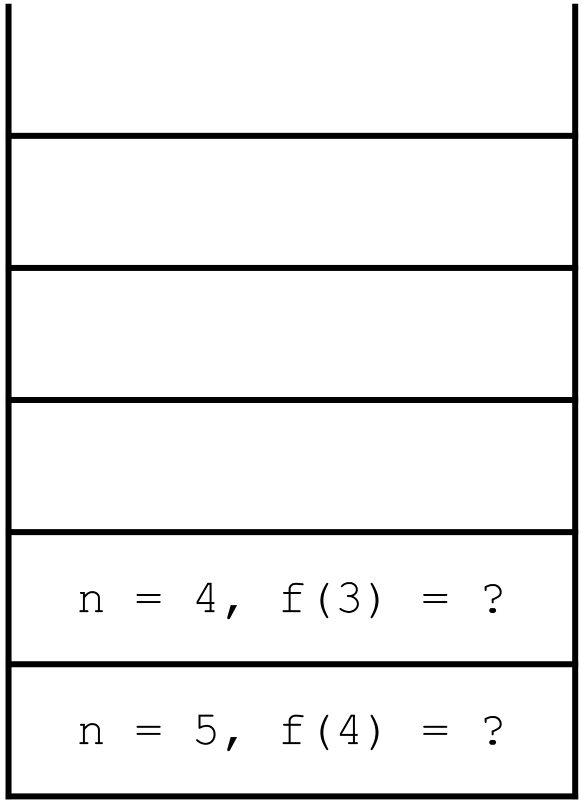
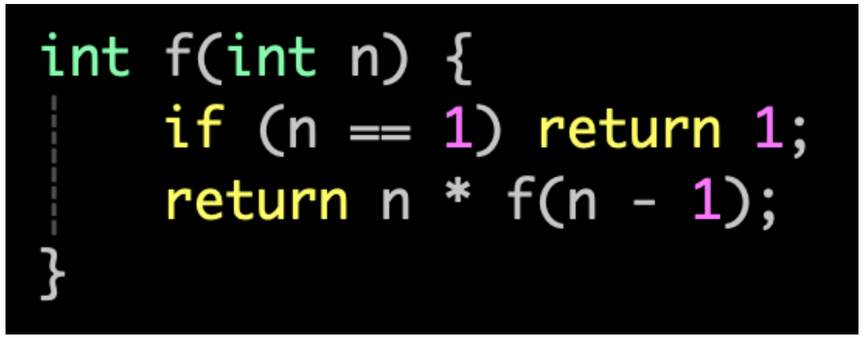


系统栈

用栈模拟递归函数



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    if (n == 1) return 1;
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}
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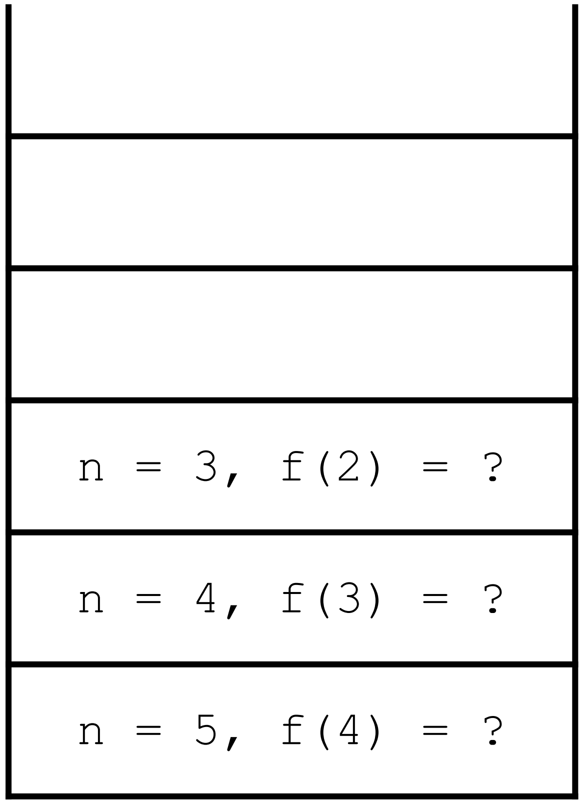
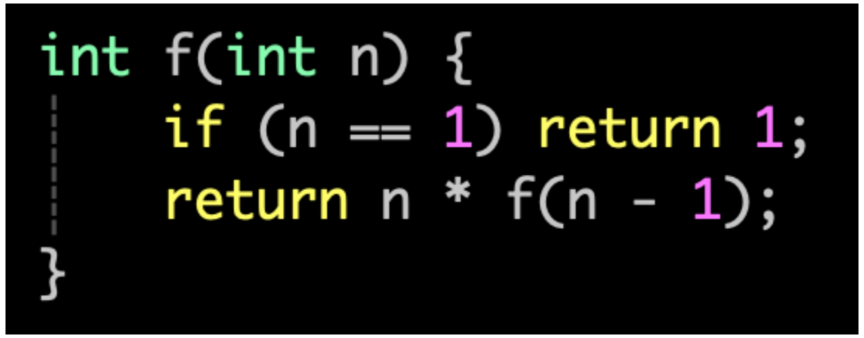


系统栈

用栈模拟递归函数



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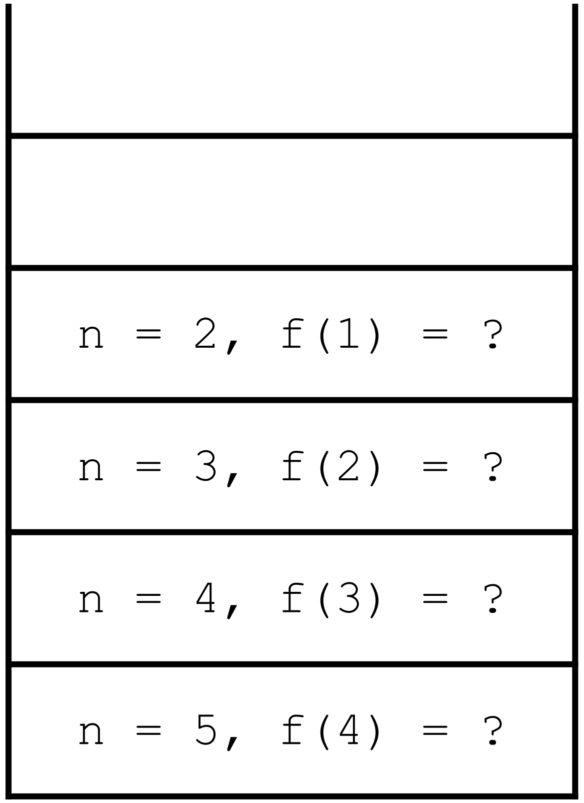
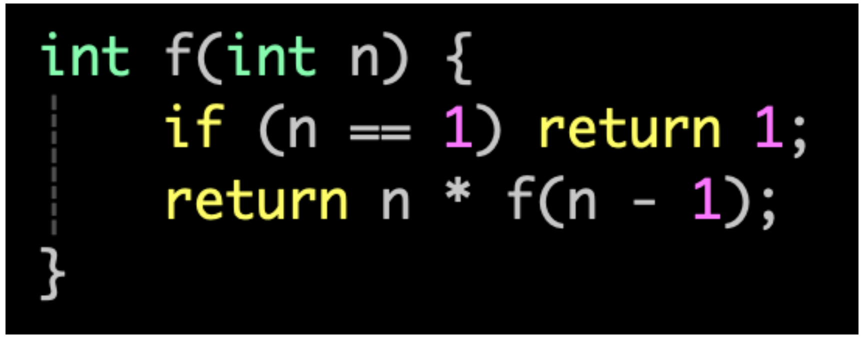


系统栈

用栈模拟递归函数



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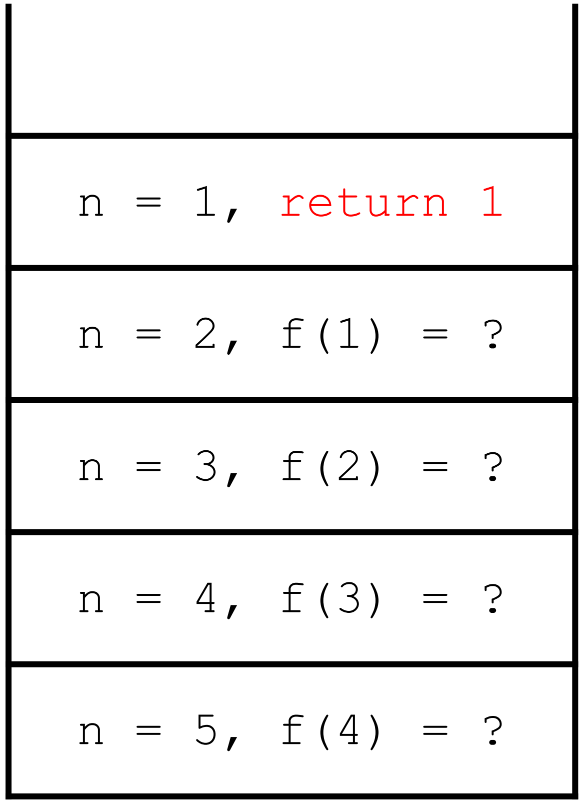
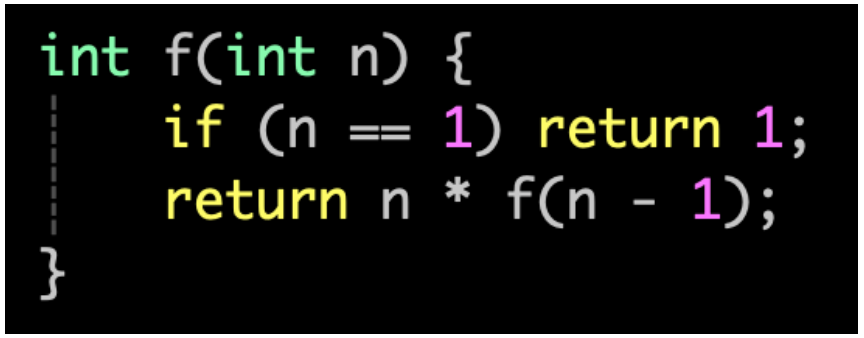


系统栈

用栈模拟递归函数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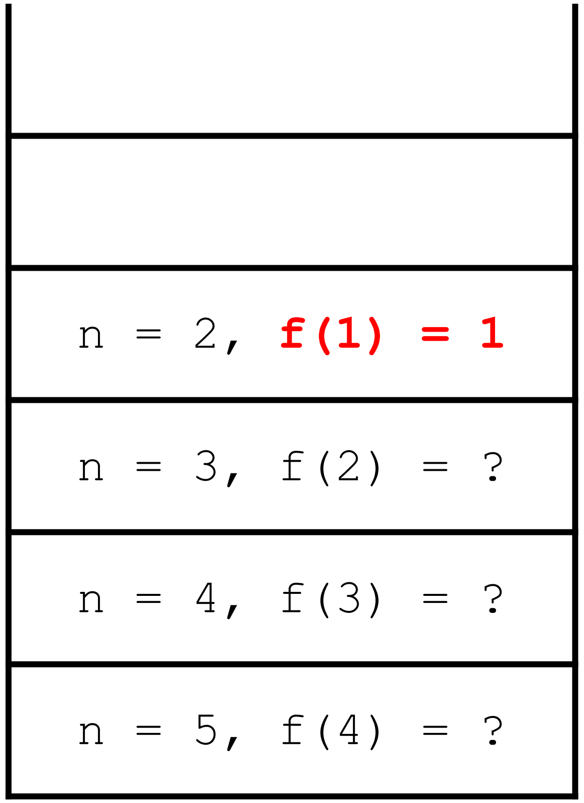
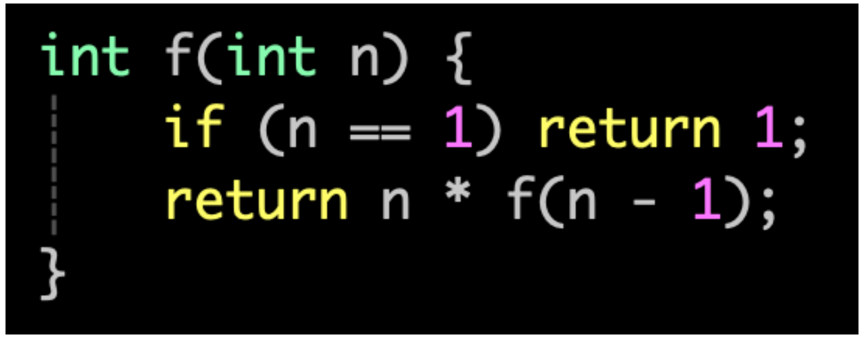


系统栈

用栈模拟递归函数



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}
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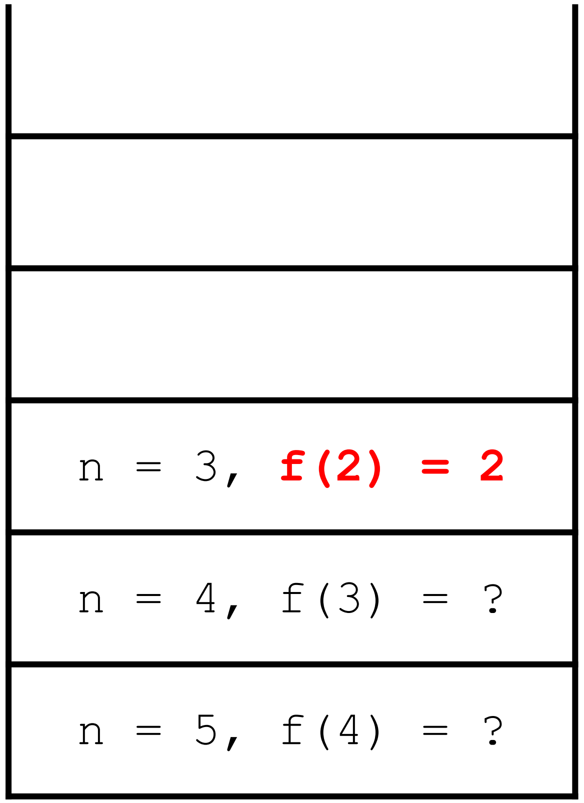
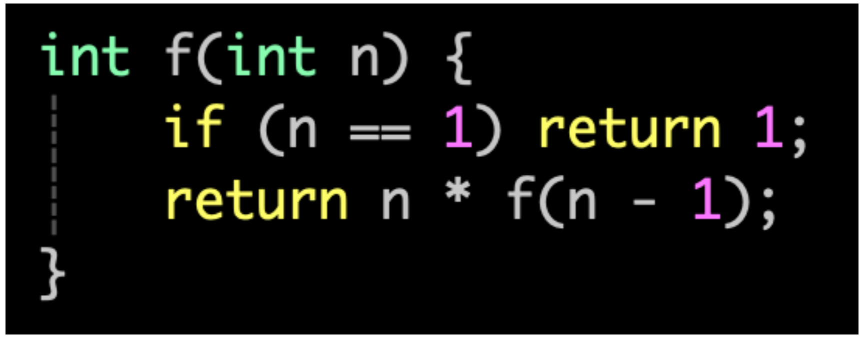


系统栈

用栈模拟递归函数



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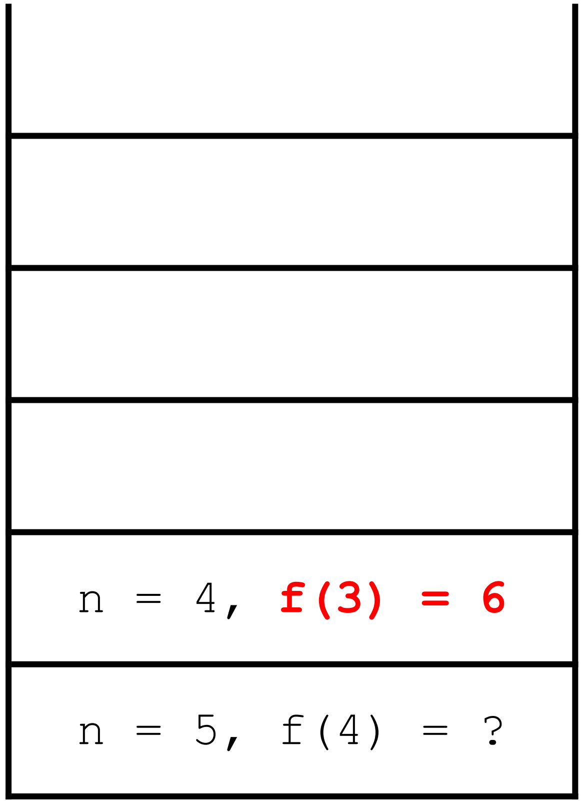
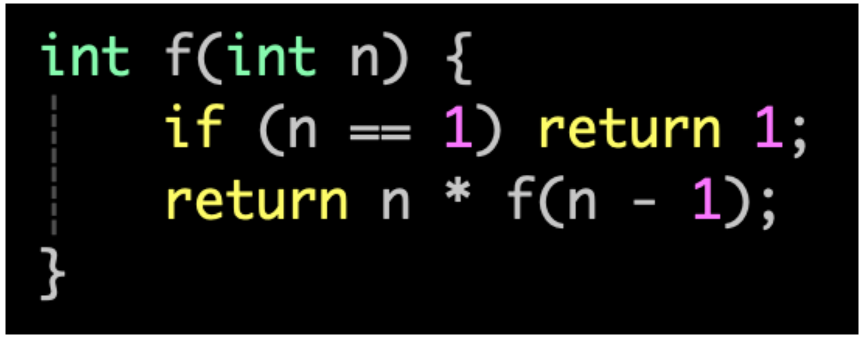


系统栈

用栈模拟递归函数



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    if (n == 1) return 1;
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}
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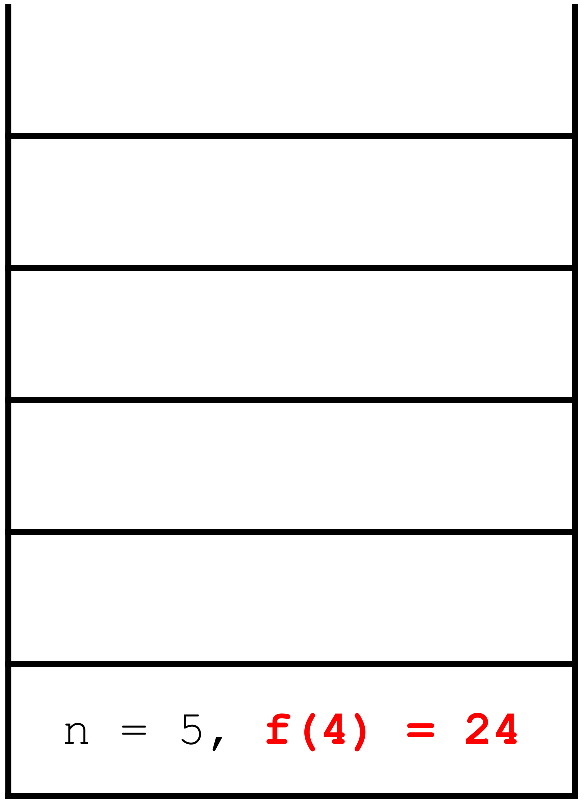
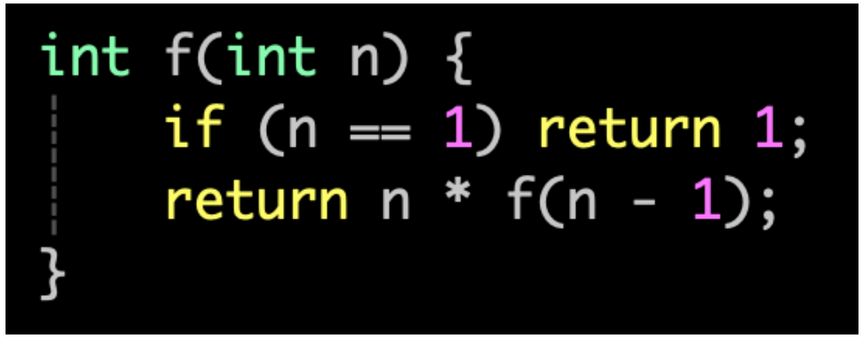


系统栈

用栈模拟递归函数



```
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    if (n == 1) return 1;
    return n * f(n - 1);
}
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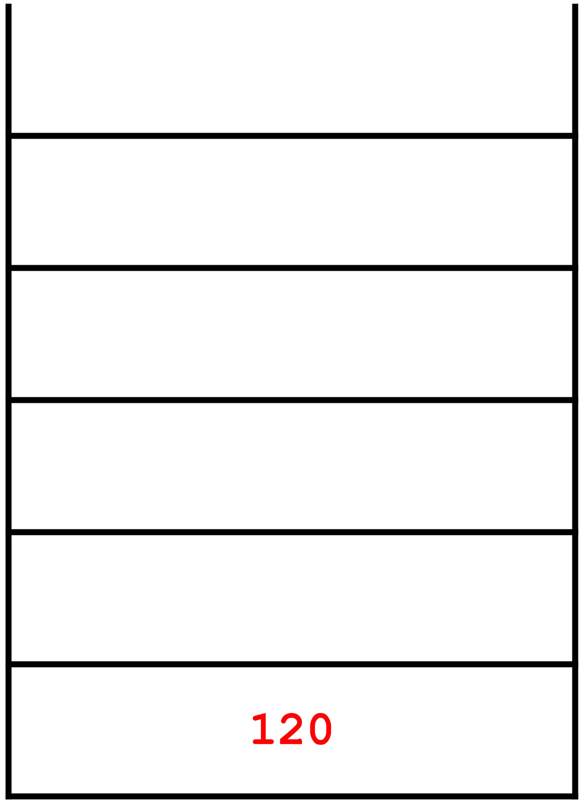
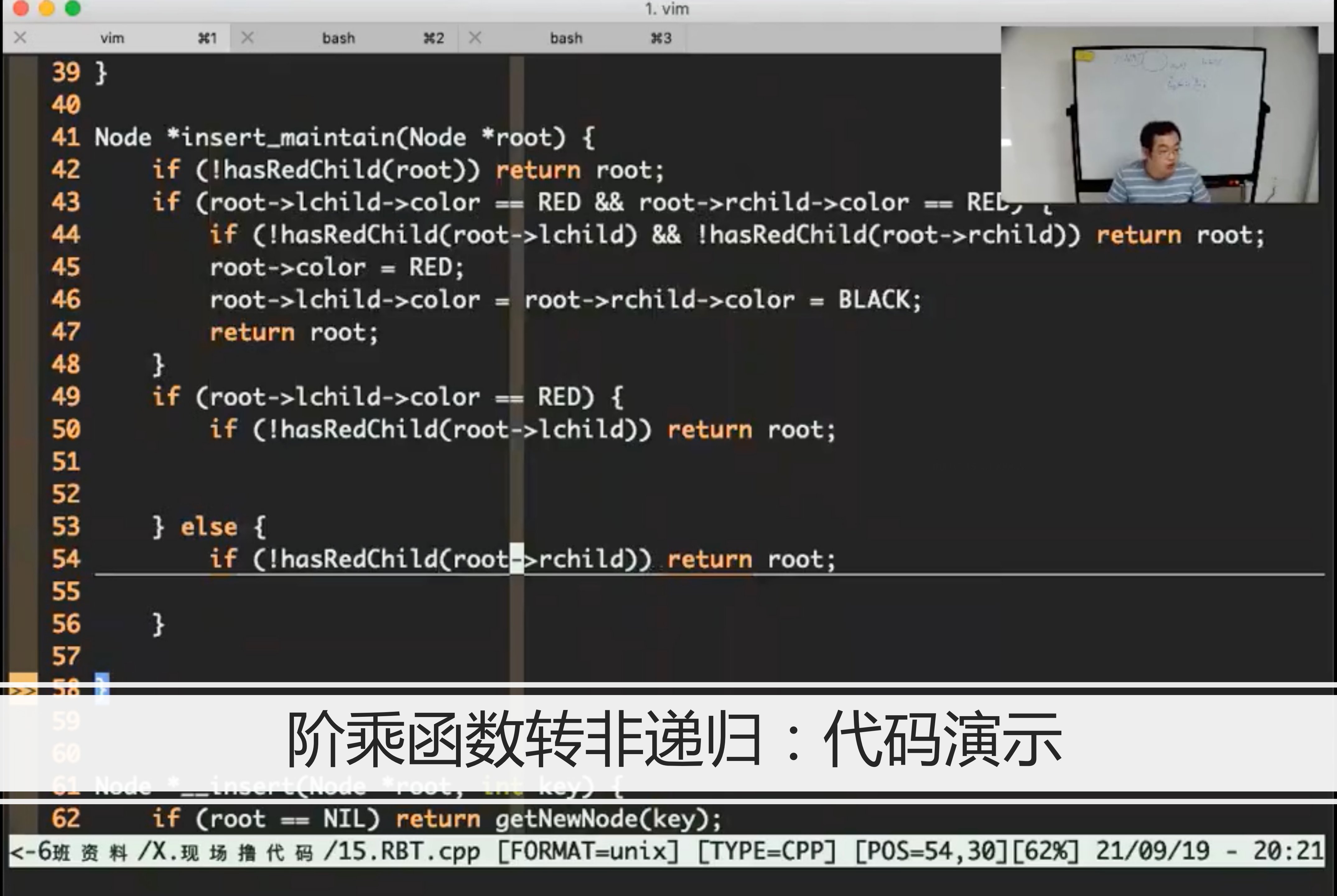


系统栈



1. vim

vim ⌘1 bash ⌘2 bash ⌘3

```
}

Node *insert_maintain(Node *root) {
    if (!hasRedChild(root)) return root;
    if (root->lchild->color == RED && root->rchild->color == RED) {
        if (!hasRedChild(root->lchild) && !hasRedChild(root->rchild)) return root;
        root->color = RED;
        root->lchild->color = root->rchild->color = BLACK;
        return root;
    }
    if (root->lchild->color == RED) {
        if (!hasRedChild(root->lchild)) return root;


    } else {
        if (!hasRedChild(root->rchild)) return root;

    }

}


Node *__insert(Node *root, int key) {
    if (root == NIL) return getNewNode(key);
```

```
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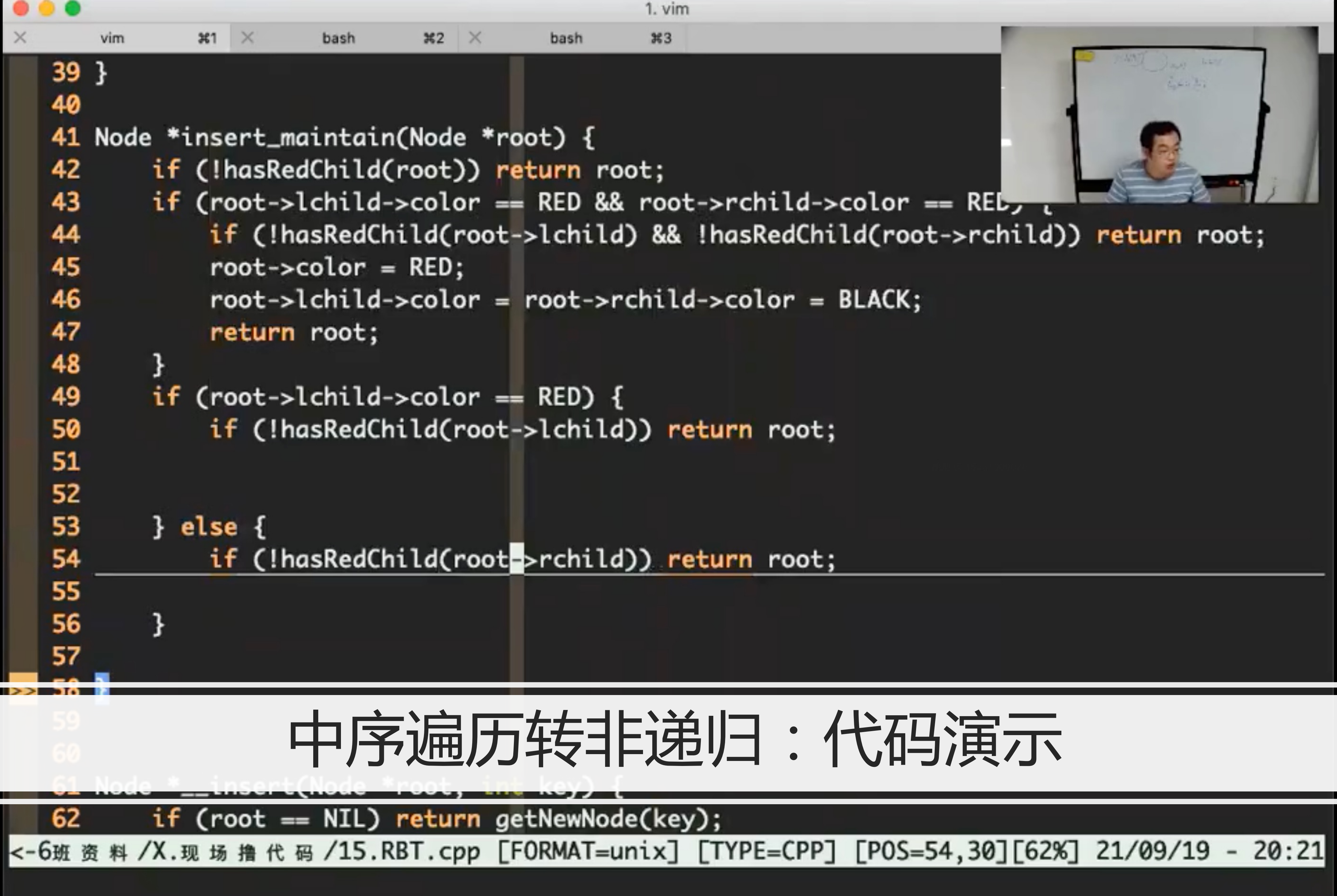
```

阶乘函数转非递归：代码演示



```
}

Node *insert_maintain(Node *root) {
    if (!hasRedChild(root)) return root;
    if (root->lchild->color == RED && root->rchild->color == RED) {
        if (!hasRedChild(root->lchild) && !hasRedChild(root->rchild)) return root;
        root->color = RED;
        root->lchild->color = root->rchild->color = BLACK;
        return root;
    }
    if (root->lchild->color == RED) {
        if (!hasRedChild(root->lchild)) return root;


    } else {
        if (!hasRedChild(root->rchild)) return root;

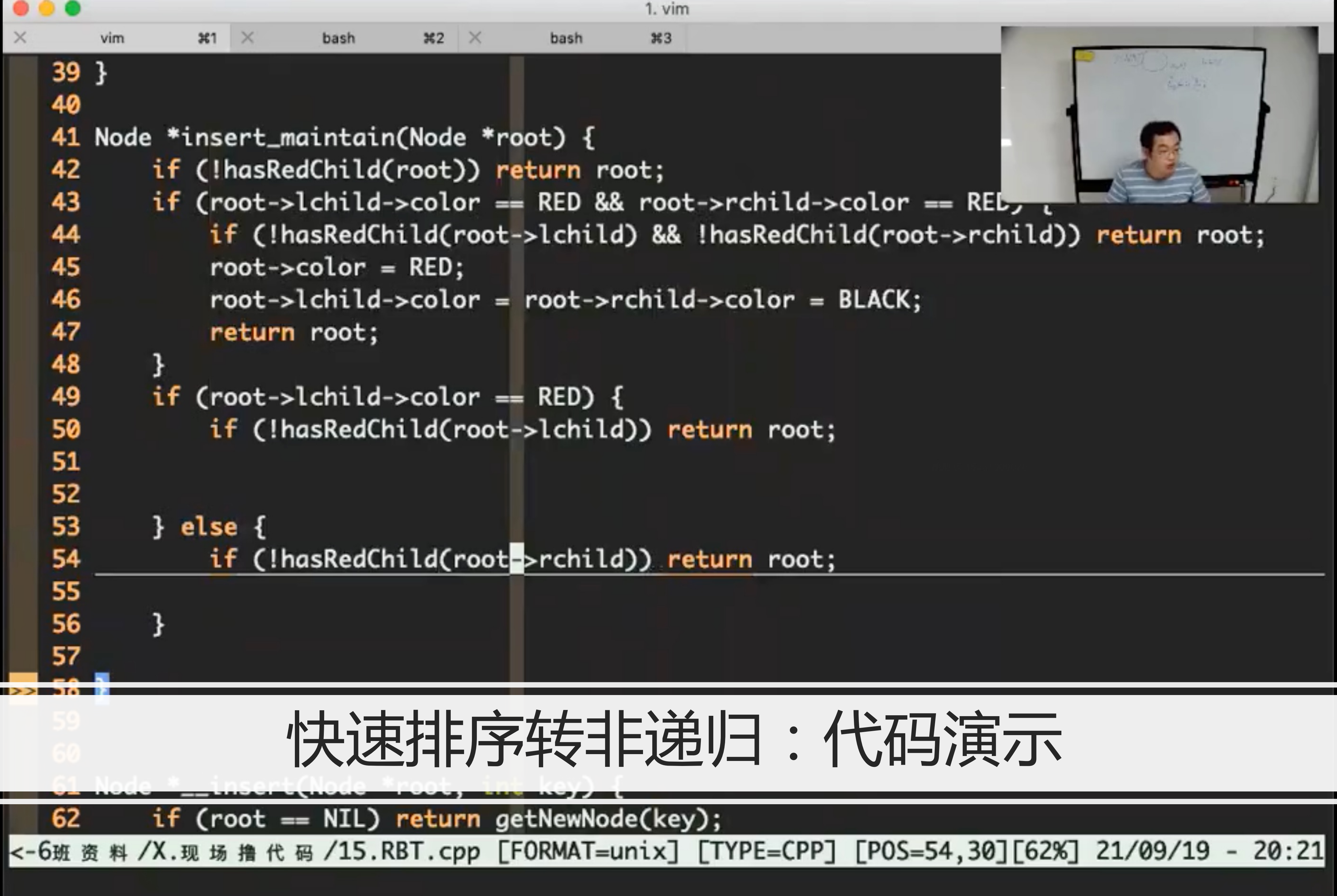
    }

}


Node *__insert(Node *root, int key) {
    if (root == NIL) return getNewNode(key);
```

```
<-6班资料/X.现场撸代码/15.RBT.cpp [FORMAT=unix] [TYPE=CPP] [POS=54,30][62%] 21/09/19 - 20:21
```

中序遍历转非递归：代码演示



```
}

Node *insert_maintain(Node *root) {
    if (!hasRedChild(root)) return root;
    if (root->lchild->color == RED && root->rchild->color == RED) {
        if (!hasRedChild(root->lchild) && !hasRedChild(root->rchild)) return root;
        root->color = RED;
        root->lchild->color = root->rchild->color = BLACK;
        return root;
    }
    if (root->lchild->color == RED) {
        if (!hasRedChild(root->lchild)) return root;


    } else {
        if (!hasRedChild(root->rchild)) return root;

    }

}


Node *__insert(Node *root, int key) {
    if (root == NIL) return getNewNode(key);
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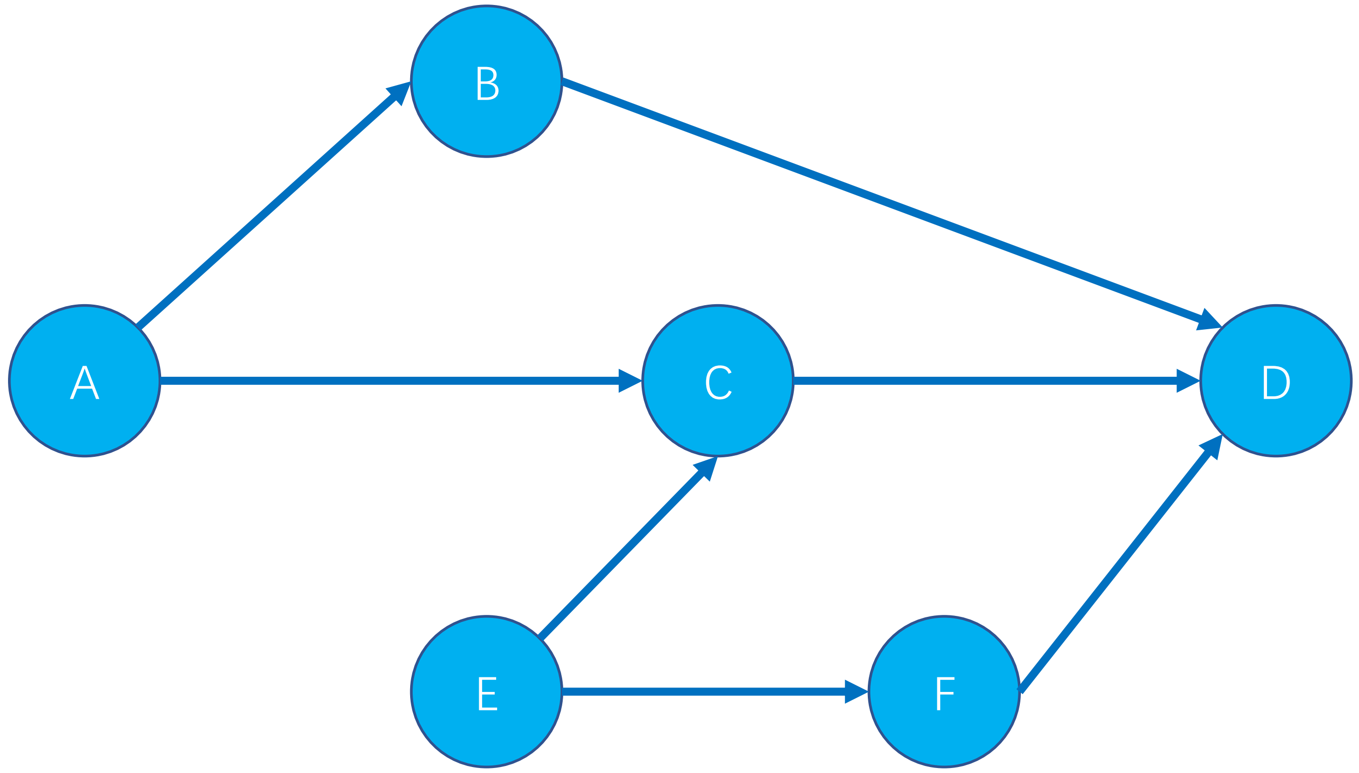
```

快速排序转非递归：代码演示

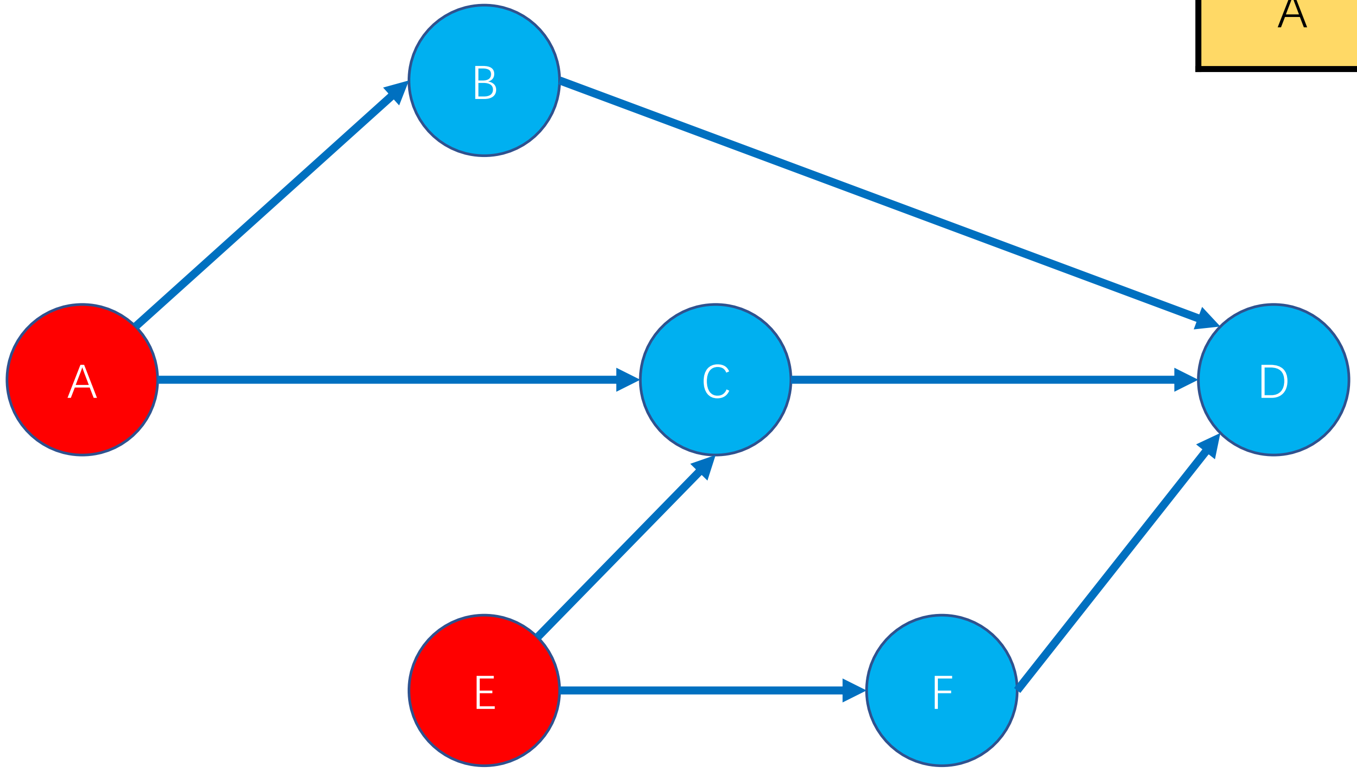
二. 拓扑序分解法

拓扑排序

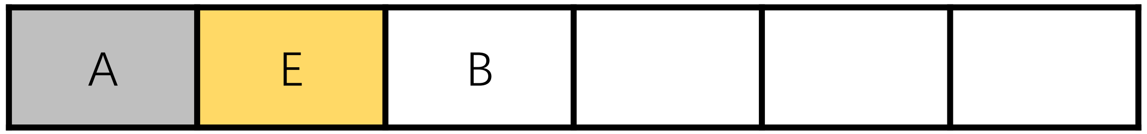


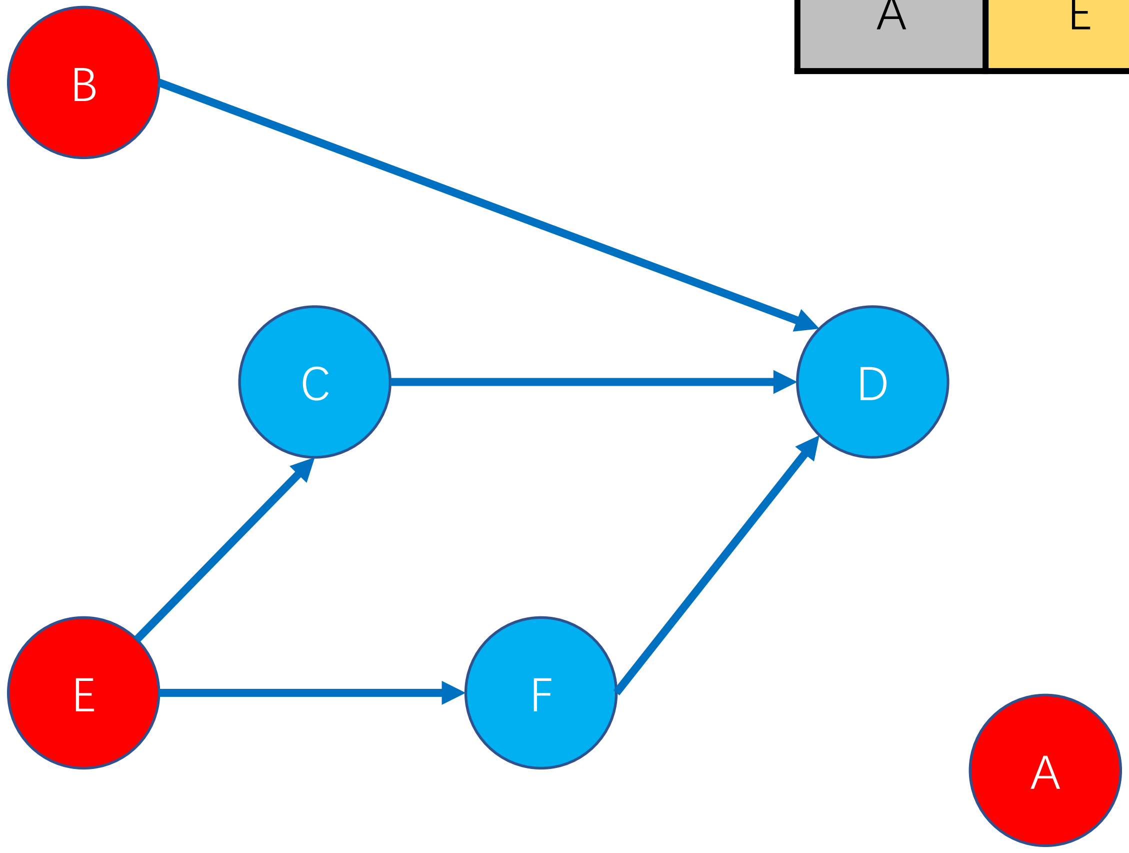
拓扑排序

A	E				



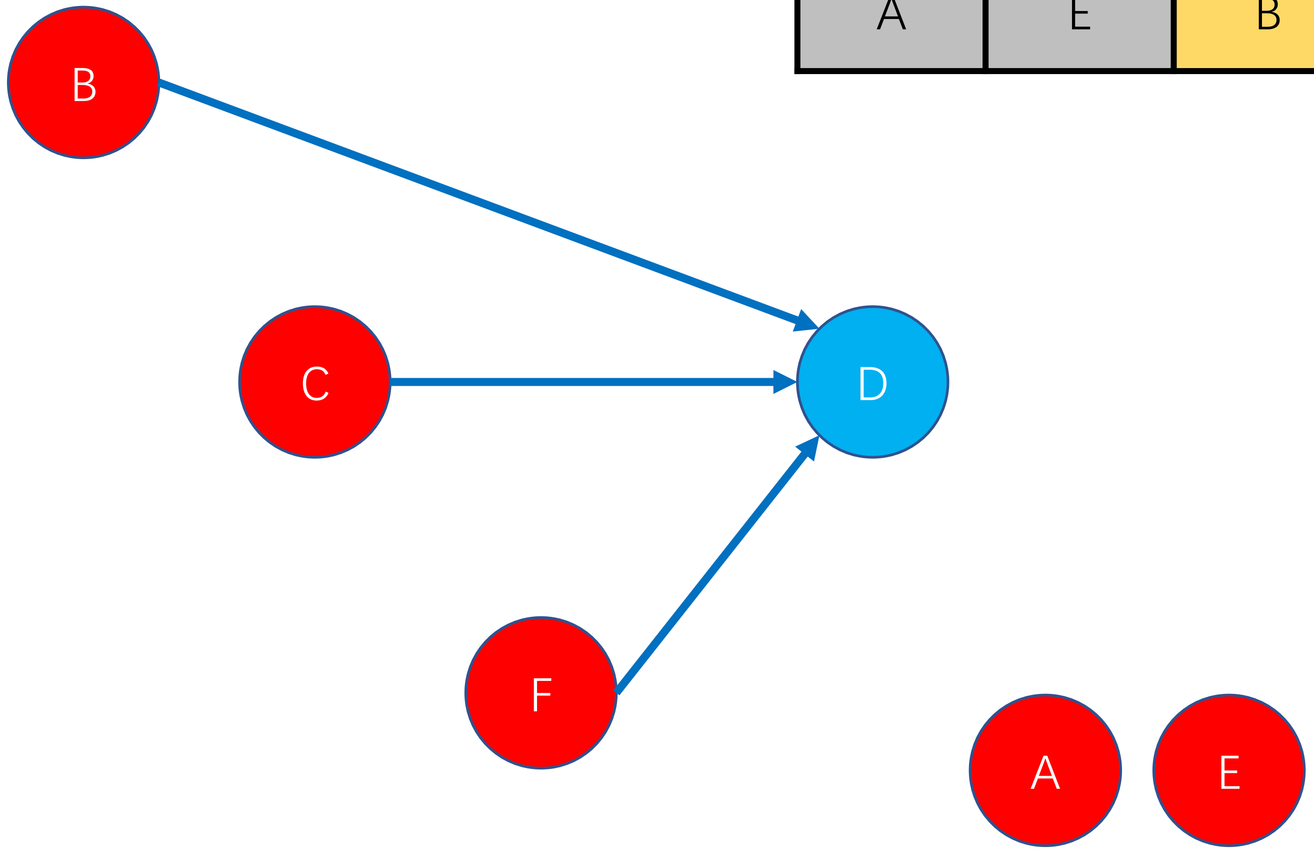
拓扑排序


A	E	B			



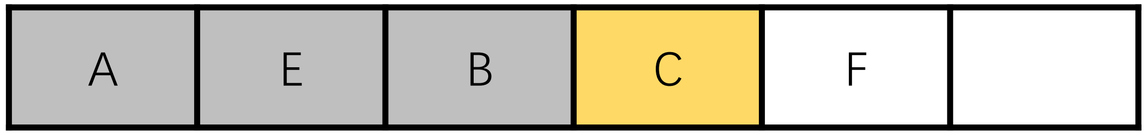
拓扑排序

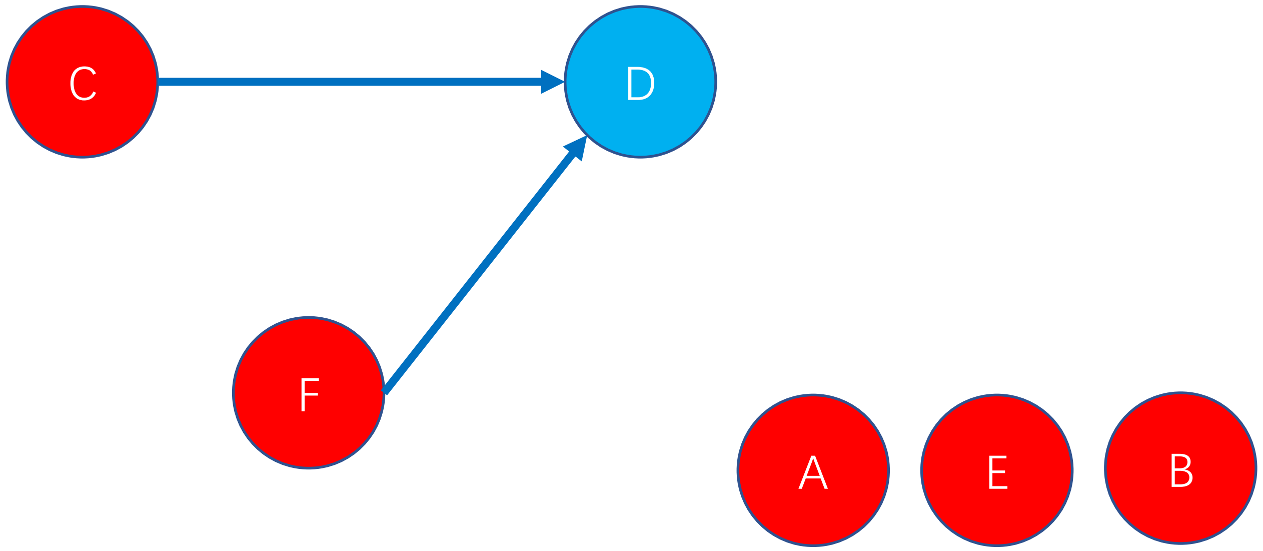
A	E	B	C	F	



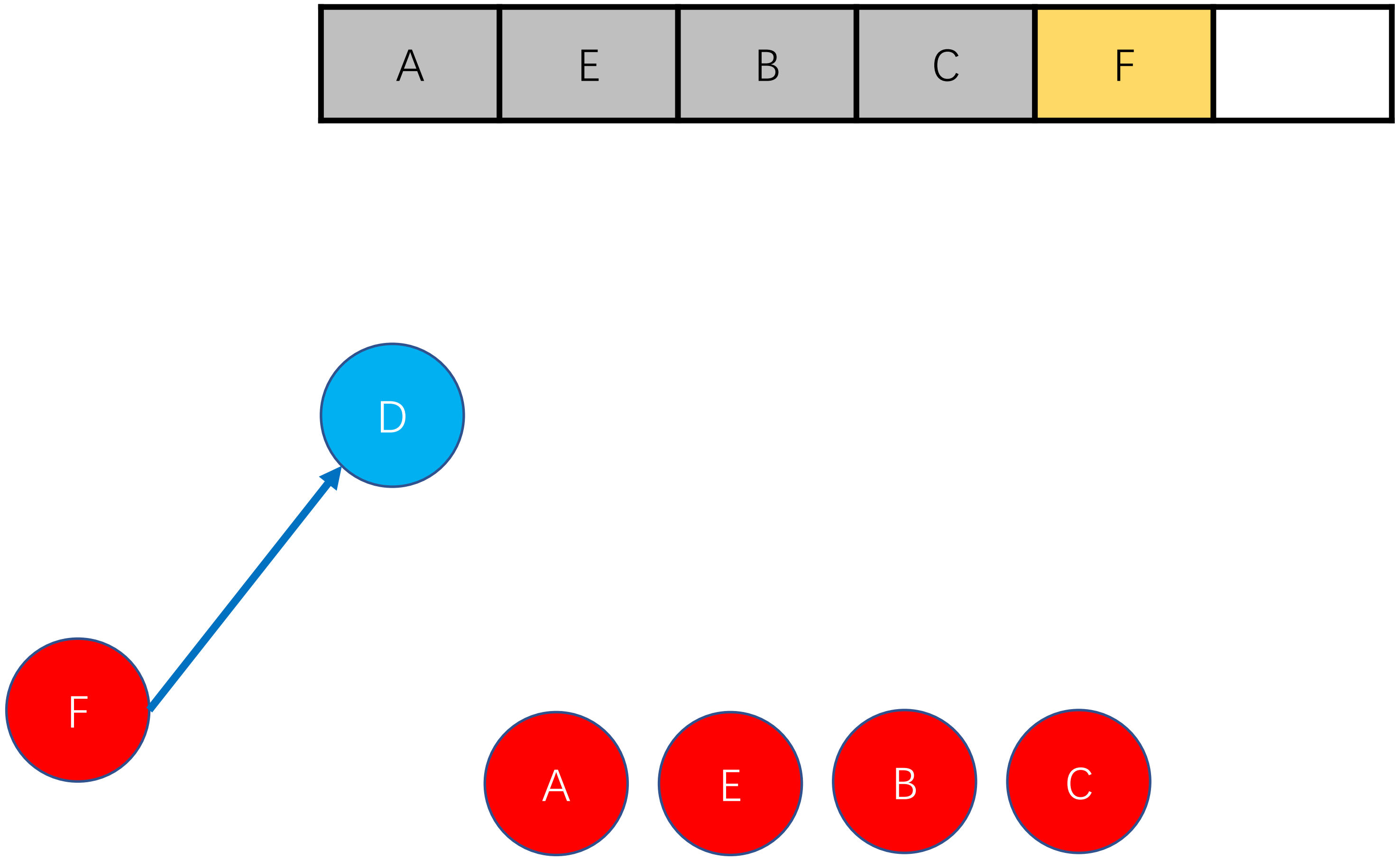
拓扑排序

A	E	B	C	F	

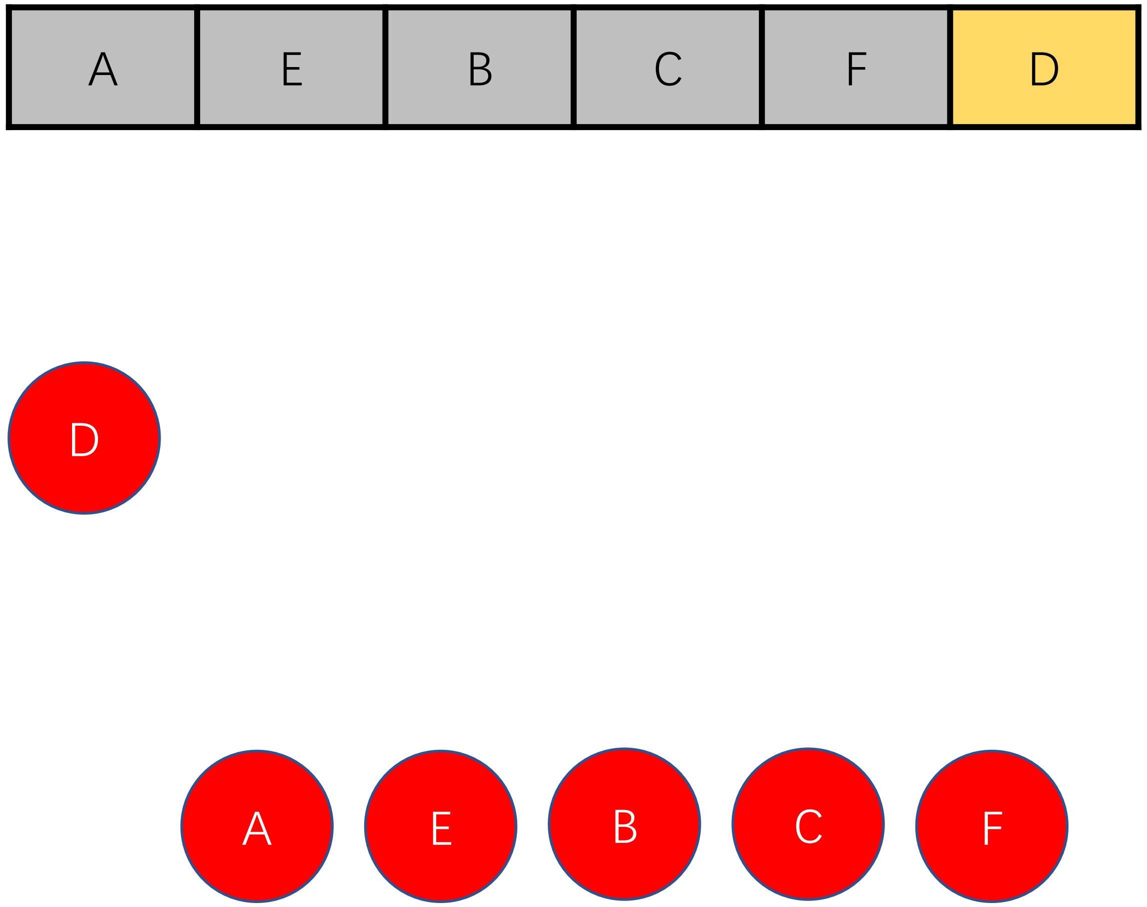




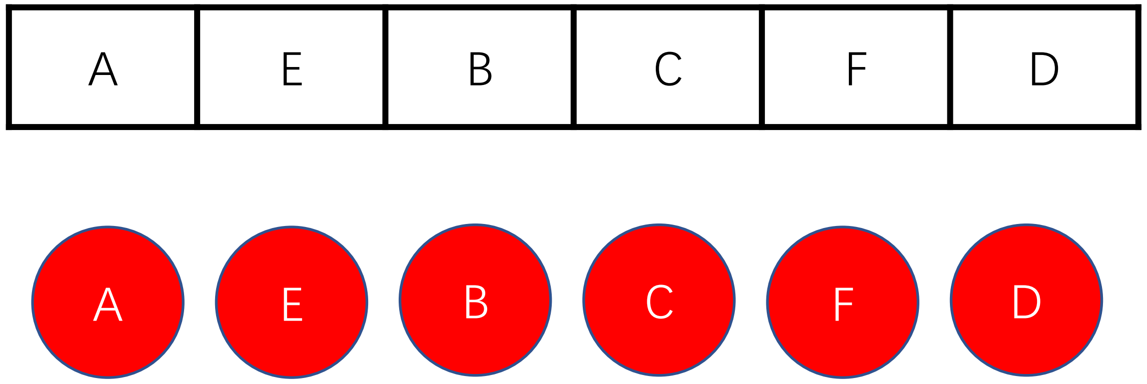
拓扑排序

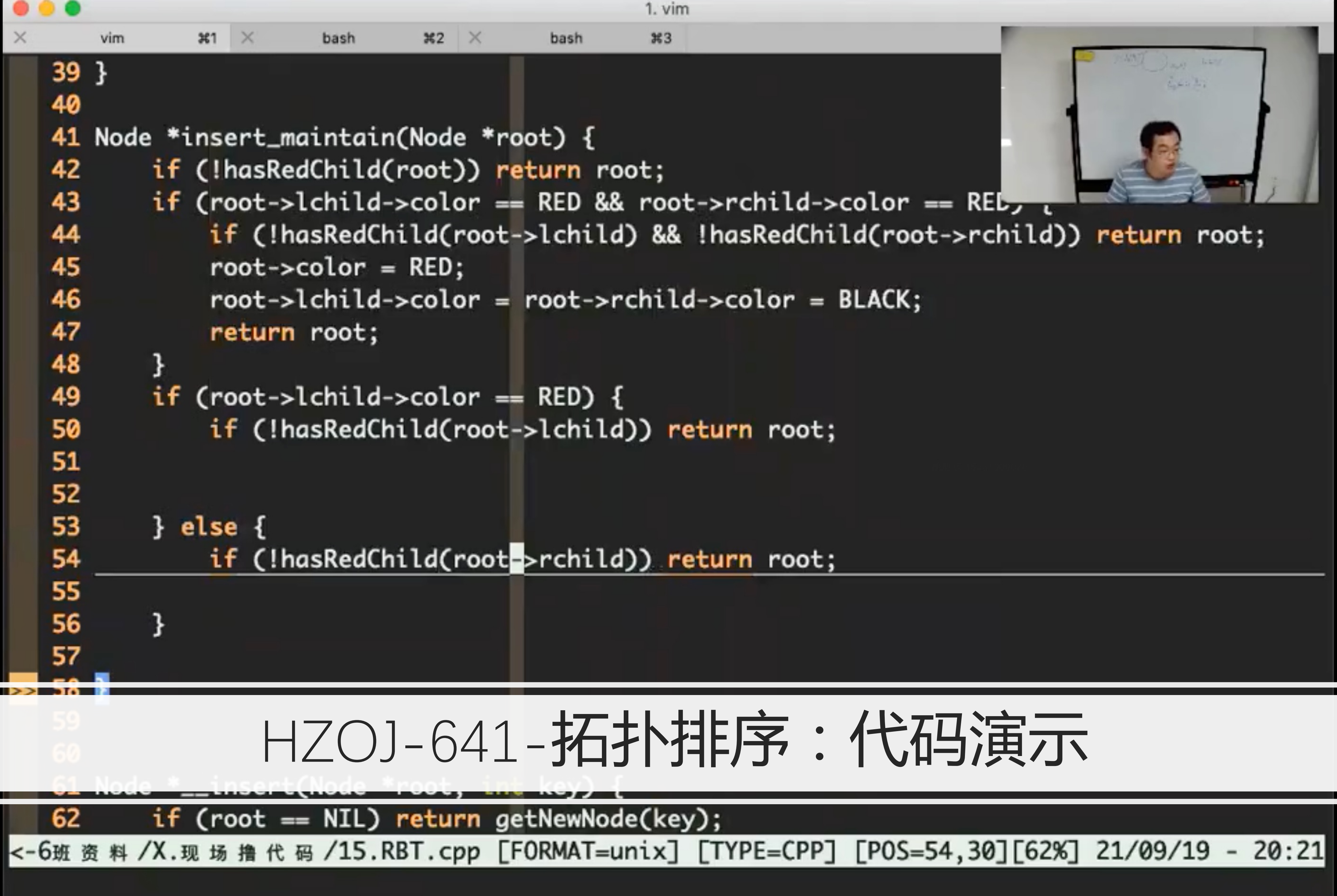


拓扑排序



拓扑排序





```
}

Node *insert_maintain(Node *root) {
    if (!hasRedChild(root)) return root;
    if (root->lchild->color == RED && root->rchild->color == RED) {
        if (!hasRedChild(root->lchild) && !hasRedChild(root->rchild)) return root;
        root->color = RED;
        root->lchild->color = root->rchild->color = BLACK;
        return root;
    }
    if (root->lchild->color == RED) {
        if (!hasRedChild(root->lchild)) return root;


    } else {
        if (!hasRedChild(root->rchild)) return root;

    }

}


Node *__insert(Node *root, int key) {
    if (root == NIL) return getNewNode(key);
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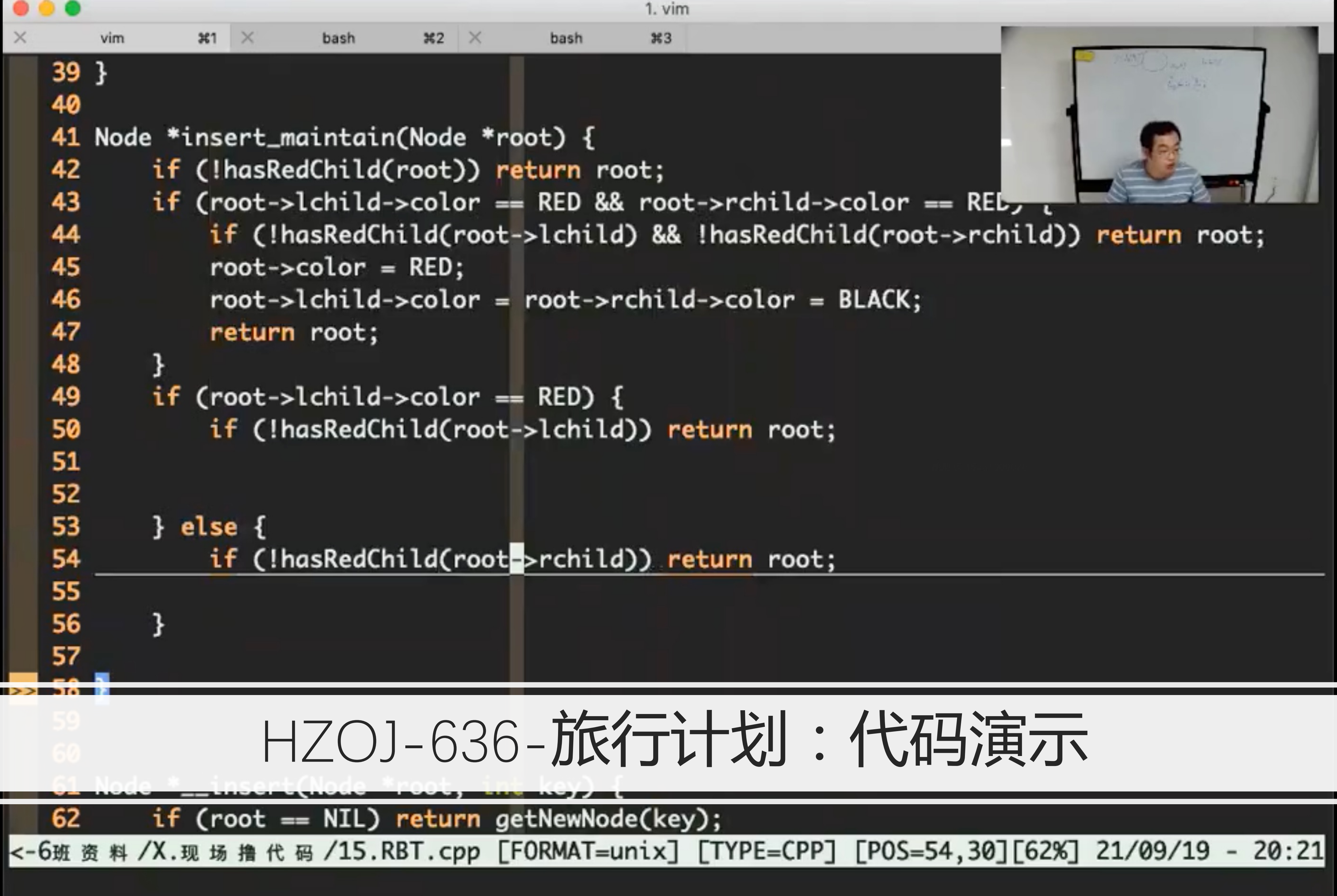
```

HZOJ-641-拓扑排序：代码演示

HZOJ-636-旅行计划：代码演示



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}

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    if (!hasRedChild(root)) return root;
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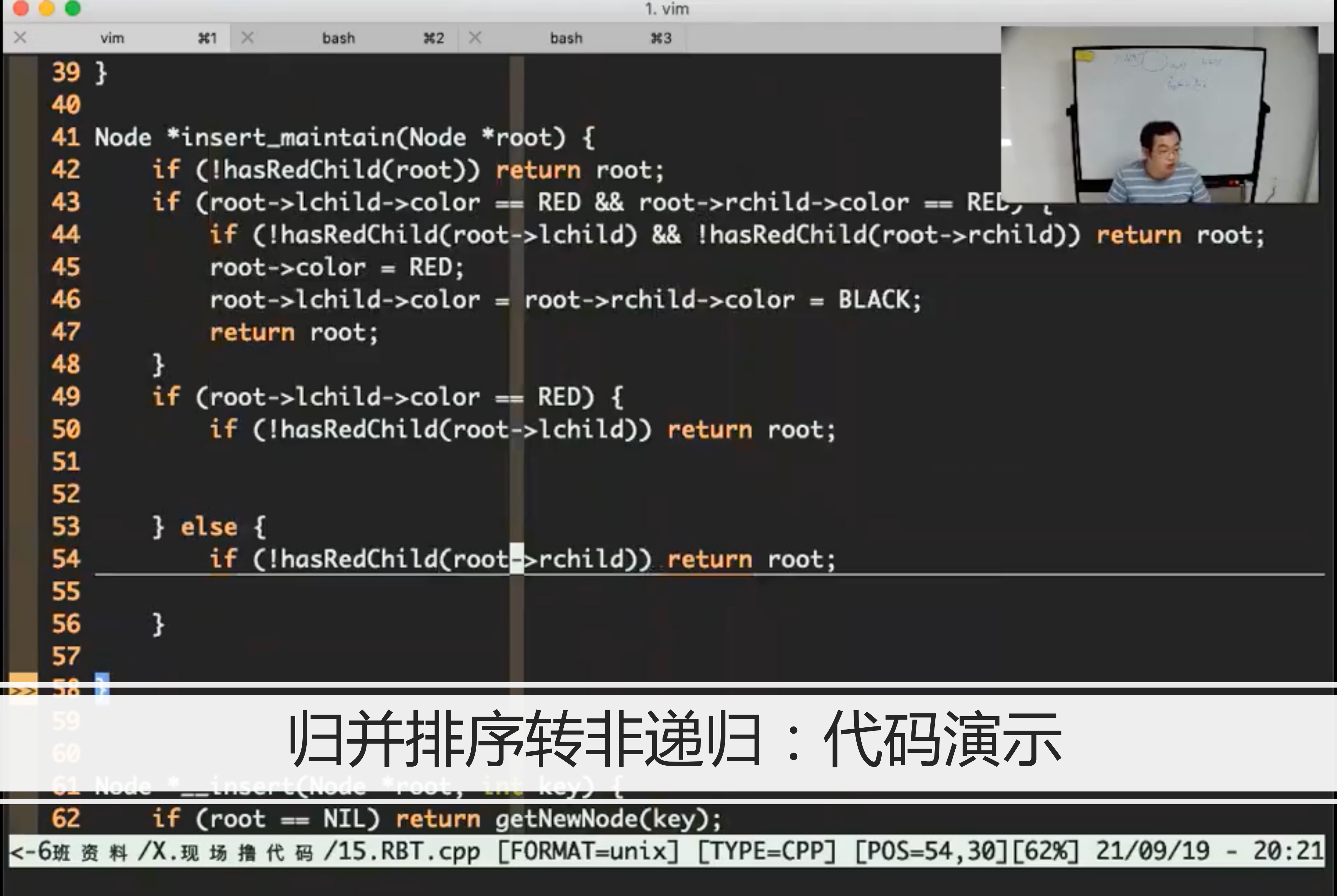

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```
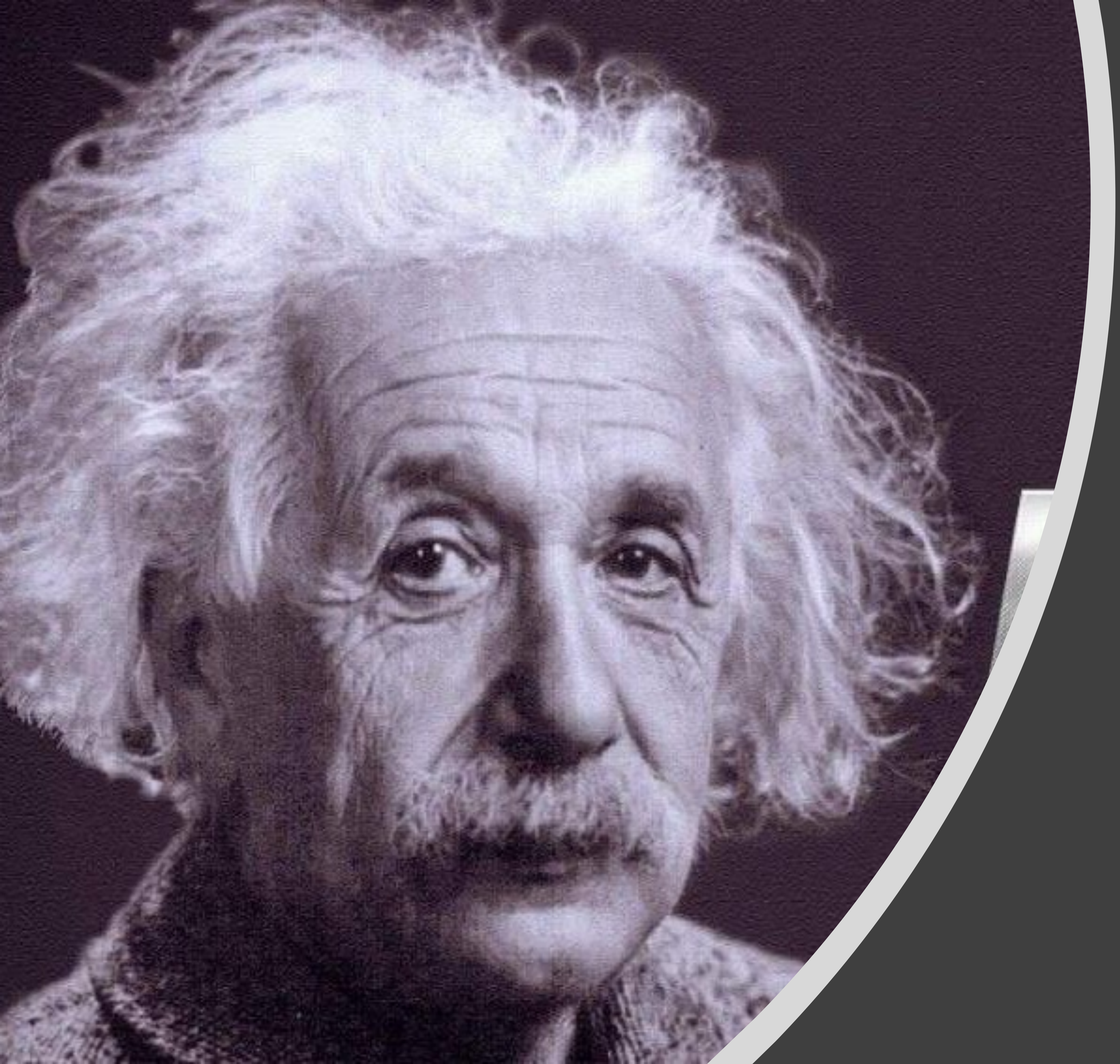

归并排序转非递归：代码演示



为什么
会出一样的题目？