



Academic Year: 2023-24

Sem: III

Sub: Operating Systems Laboratory

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### **EXPERIMENT NO. 04**

**Q1)**

#### **CODE**

```
import java.util.*;
class Exp4Q1.java{
public static void main(String[] args) {
int[][] allocation={{1,0,1},{2,1,2},{3,0,0},{1,0,1}};
int[][] max={{2,1,1},{5,4,4},{3,1,1},{1,1,1}};
int[] available={2,1,1};
int[][] need=new int[4][3];

for(int i=0;i<allocation.length;i++){
for(int j=0;j<available.length;j++){
need[i][j]=max[i][j]-allocation[i][j]; }
}
int[] work=available;
boolean[] finish= new boolean[max.length];
for(int i=0;i<work.length;i++){
finish[i]= false; }
int h=0;
int t=0;
System.out.println("Sequence");
while(h<=4){
for(int i=0;i<max.length;i++){
if(finish[i]==false){
if(need[i][0]<=work[0] && need[i][1]<=work[1] &&
need[i][2]<=work[2]){
```

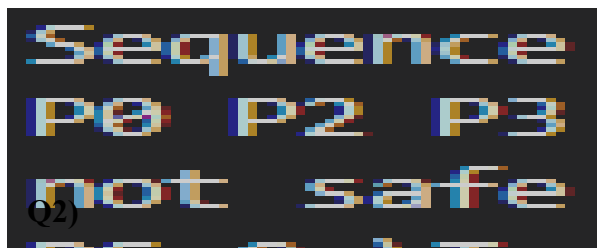
```

for(int j=0;j<work.length;j++){
work[j] = work[j]+allocation[i][j];
}
System.out.print("P"+i+" ");
finish[i]=true;
t++;
}
} }
h++;
}
if(t==max.length){
System.out.println("\nThe process is safe");
}
else{
System.out.println("\nnot safe");
}

} }

```

### **OUTPUT**



### **CODE**

```

import java.util.*;

public class Exp4Q2 {

public static void main(String[] args) {

int[][] allocation = { { 0, 1, 1, 0 }, { 1, 2, 3, 1 }, { 1, 3, 6, 5 }, { 0, 6, 3, 2 }, { 0, 0, 1, 4 } };

int[][] max = { { 0, 2, 1, 0 }, { 1, 6, 5, 2 }, { 2, 3, 6, 6 }, { 0, 6, 5, 2 }, { 0, 6, 5, 6 } };

int[] available = { 1, 5, 2, 0 }; int[][] need = new int[5][4];

```

```

for (int i = 0; i < allocation.length; i++) {
    for (int j = 0; j < available.length; j++) {
        need[i][j] = max[i][j] - allocation[i][j];
    }
}

int[] work = available;

boolean[] finish = new boolean[max.length];

for (int i = 0; i < max.length; i++) {
    finish[i] = false;
}

int h = 0;

int t = 0;

System.out.println("Sequence"); while (h <= 5) {
    for (int i = 0; i < max.length; i++) { if (finish[i] == false) {
        if (need[i][0] <= work[0] && need[i][1] <= work[1] && need[i][2] <= work[2]
        && need[i][3] <= work[3]) {
            for (int j = 0; j < work.length; j++) {
                work[j] = work[j] + allocation[i][j];
            }

            System.out.print("P" + i + " ");

            finish[i] = true; t++;
        } }
    }

    h++;
}

if (t == max.length) {
    System.out.println("\nThe process is safe");
}

else {
    System.out.println("\n not safe");
}

```

}

**OUTPUT**

Sequence

P0 P3 P4 P1 P2

The process is safe