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LAB 08

Implement the above code and paste the screen shot of the output.

CODE:

```
#include <stdio.h>

#include <conio.h>


int max[100][100];

int alloc[100][100];

int need[100][100];

int avail[100];

int n, r;

void input();

void show();

void cal();

int main() {

   int i, j;

   printf("********** Deadlock Detection Algo ************\n");

   input();

   show();

   cal();

   getch();

   return 0;

}

void input() {

   int i, j;

   printf("Enter the no of Processes: ");

   scanf("%d", &n);

   printf("Enter the no of resource instances: ");
```

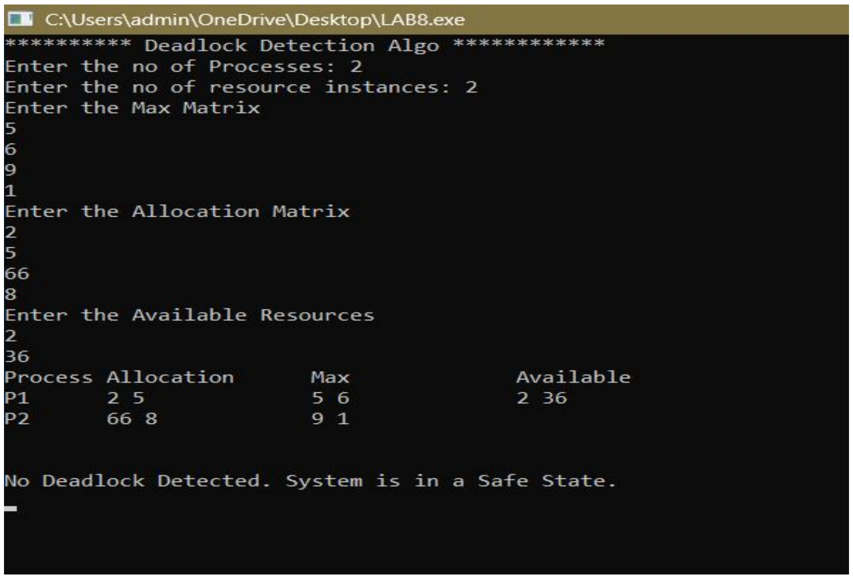
```
    scanf("%d", &r);
    printf("Enter the Max Matrix\n");
    for (i = 0; i < n; i++) {
        for (j = 0; j < r; j++) {
            scanf("%d", &max[i][j]);
        }
    }
    printf("Enter the Allocation Matrix\n");
    for (i = 0; i < n; i++) {
        for (j = 0; j < r; j++) {
            scanf("%d", &alloc[i][j]);
        }
    }
    printf("Enter the Available Resources\n");
    for (j = 0; j < r; j++) {
        scanf("%d", &avail[j]);
    }
}
void show() {
    int i, j;
    printf("Process\tAllocation\tMax\t\tAvailable\n");

    for (i = 0; i < n; i++) {
        printf("P%d\t", i + 1);
        for (j = 0; j < r; j++) {
            printf("%d ", alloc[i][j]);
        }
        printf("\t\t");
        for (j = 0; j < r; j++) {
            printf("%d ", max[i][j]);
        }
        if (i == 0) {
            printf("\t\t");
            for (j = 0; j < r; j++) {
                printf("%d ", avail[j]);
            }
        }
        printf("\n");
    }
}
void cal() {
    int finish[100], flag = 1, dead[100], safe[100];
    int i, j, k, c1 = 0;
    // Initialize finish array
    for (i = 0; i < n; i++) {
        finish[i] = 0;
    }

    // Calculate Need Matrix
    for (i = 0; i < n; i++) {
        for (j = 0; j < r; j++) {
            need[i][j] = max[i][j] - alloc[i][j];
        }
    }
    while (flag) {
        flag = 0;
        for (i = 0; i < n; i++) {
            int count = 0;
            if (!finish[i]) {
                for (j = 0; j < r; j++) {
                    if (need[i][j] <= avail[j]) {
                        count++;
                    }
                }
                if (count == r) {
                    for (k = 0; k < r; k++) {
                        avail[k] += alloc[i][k];
                    }
                    finish[i] = 1;
                    flag = 1;
                }
            }
        }
    }
    // Check for deadlock
    int deadlockExists = 0;
    int deadCount = 0;

    for (i = 0; i < n; i++) {
        if (!finish[i]) {
            dead[deadCount++] = i;
            deadlockExists = 1;
        }
    }
    if (deadlockExists) {
        printf("\n\nSystem is in Deadlock and the Deadlocked processes are:\n");
        for (i = 0; i < deadCount; i++) {
            printf("P%d\t", dead[i]);
        }
        printf("\n");
    } else {
        printf("\n\nNo Deadlock Detected. System is in a Safe State.\n");
    }
}
```

OUTPUT:



```
C:\Users\admin\OneDrive\Desktop\LAB8.exe
********** Deadlock Detection Algo ************
Enter the no of Processes: 2
Enter the no of resource instances: 2
Enter the Max Matrix
5
6
9
1
Enter the Allocation Matrix
2
5
66
8
Enter the Available Resources
2
36
Process Allocation      Max             Available
P1      2 5             5 6             2 36
P2      66 8            9 1


No Deadlock Detected. System is in a Safe State.
```