Operating Systems (CT-353) Lab 08:

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CODE:

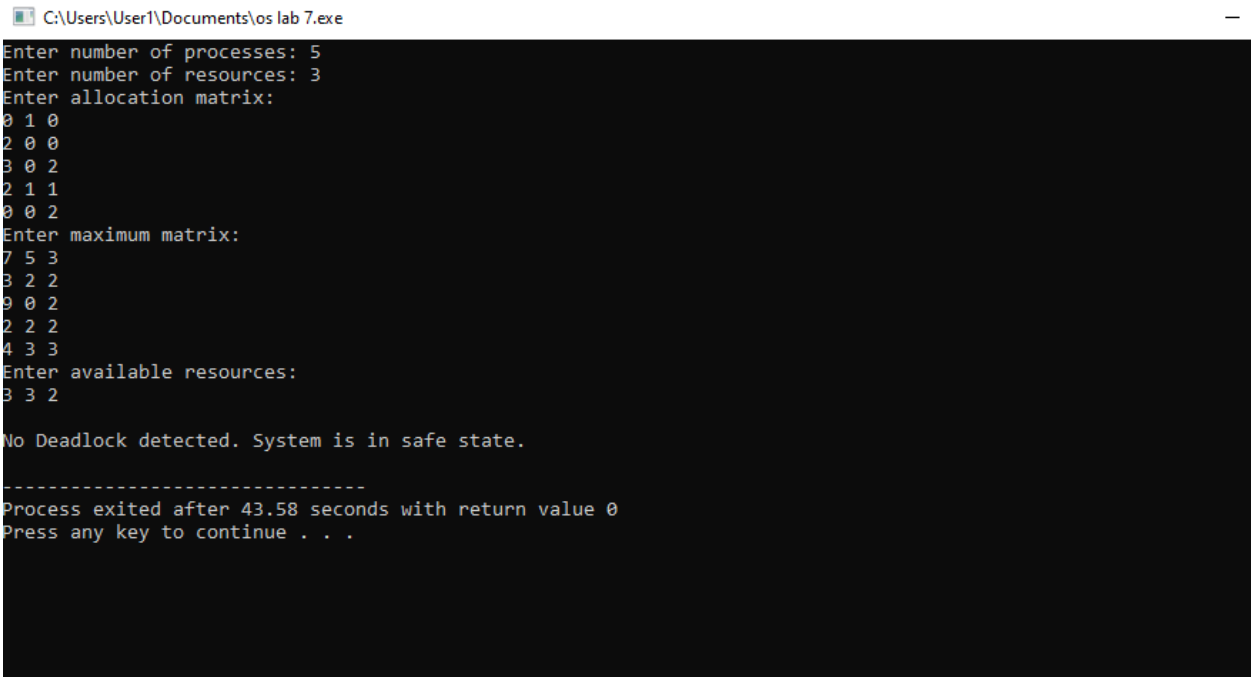
```
#include <stdio.h>
int main() {
   int n, r, i, j, k;
   int alloc[10][10], max[10][10], avail[10];
   int finish[10], need[10][10], dead[10];
   int flag = 0, c = 0;
   printf("Enter number of processes: ");
   scanf("%d", &n);
   printf("Enter number of resources: ");
   scanf("%d", &r);
   printf("Enter allocation matrix:\n");
   for(i = 0; i < n; i++)
      for(j = 0; j < r; j++)
         scanf("%d", &alloc[i][j]);
   printf("Enter maximum matrix:\n");
   for(i = 0; i < n; i++)
      for(j = 0; j < r; j++)
         scanf("%d", &max[i][j]);

   printf("Enter available resources:\n");
   for(i = 0; i < r; i++)
      scanf("%d", &avail[i]);
```

```
for(i = 0; i < n; i++)
   for(j = 0; j < r; j++)
      need[i][j] = max[i][j] - alloc[i][j];
for(i = 0; i < n; i++)
   finish[i] = 0;
for(k = 0; k < n; k++) {
   for(i = 0; i < n; i++) {
      if(finish[i] == 0) {
         c = 0;
         for(j = 0; j < r; j++) {
            if(need[i][j] <= avail[j])
               c++;
         }
         if(c == r) {
            for(j = 0; j < r; j++)
               avail[j] += alloc[i][j];
            finish[i] = 1;
            flag = 1;
         }
      }
   }
}
flag = 0;
j = 0;
for(i = 0; i < n; i++) {
   if(finish[i] == 0) {
      dead[j] = i;
      j++;
      flag = 1;
```

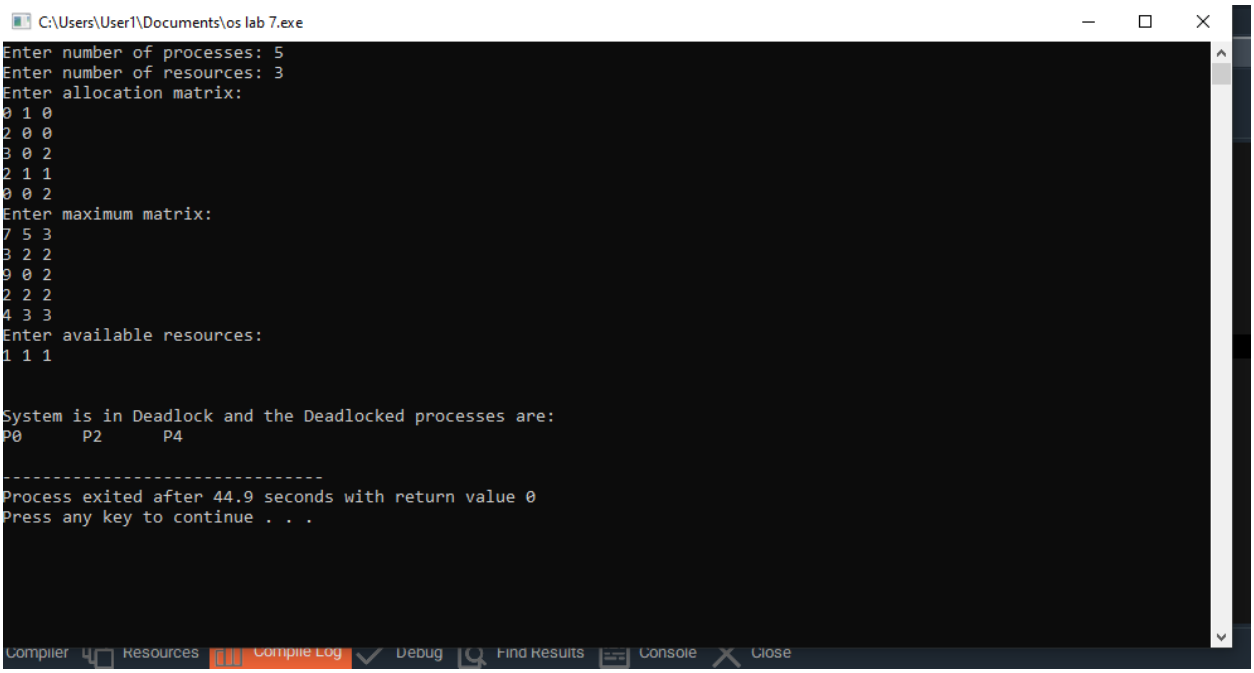
```
        }
    }
    if(flag == 1) {
        printf("\n\nSystem is in Deadlock and the Deadlocked processes are:\n");
        for(i = 0; i < j; i++)
            printf("P%d\t", dead[i]);
        printf("\n");
    } else {
        printf("\nNo Deadlock detected. System is in safe state.\n");
    }
    return 0;
}
```

OUTPUT:

No Deadlock:



Deadlock:


C:\Users\User1\Documents\os lab 7.exe
Enter number of processes: 5
Enter number of resources: 3
Enter allocation matrix:
0 1 0
2 0 0
3 0 2
2 1 1
0 0 2
Enter maximum matrix:
7 5 3
3 2 2
9 0 2
2 2 2
4 3 3
Enter available resources:
1 1 1
System is in Deadlock and the Deadlocked processes are:
P0 P2 P4
Process exited after 44.9 seconds with return value 0
Press any key to continue . . .
Compiler
Resources
Compile Log
Debug
Find Results
Console
Close