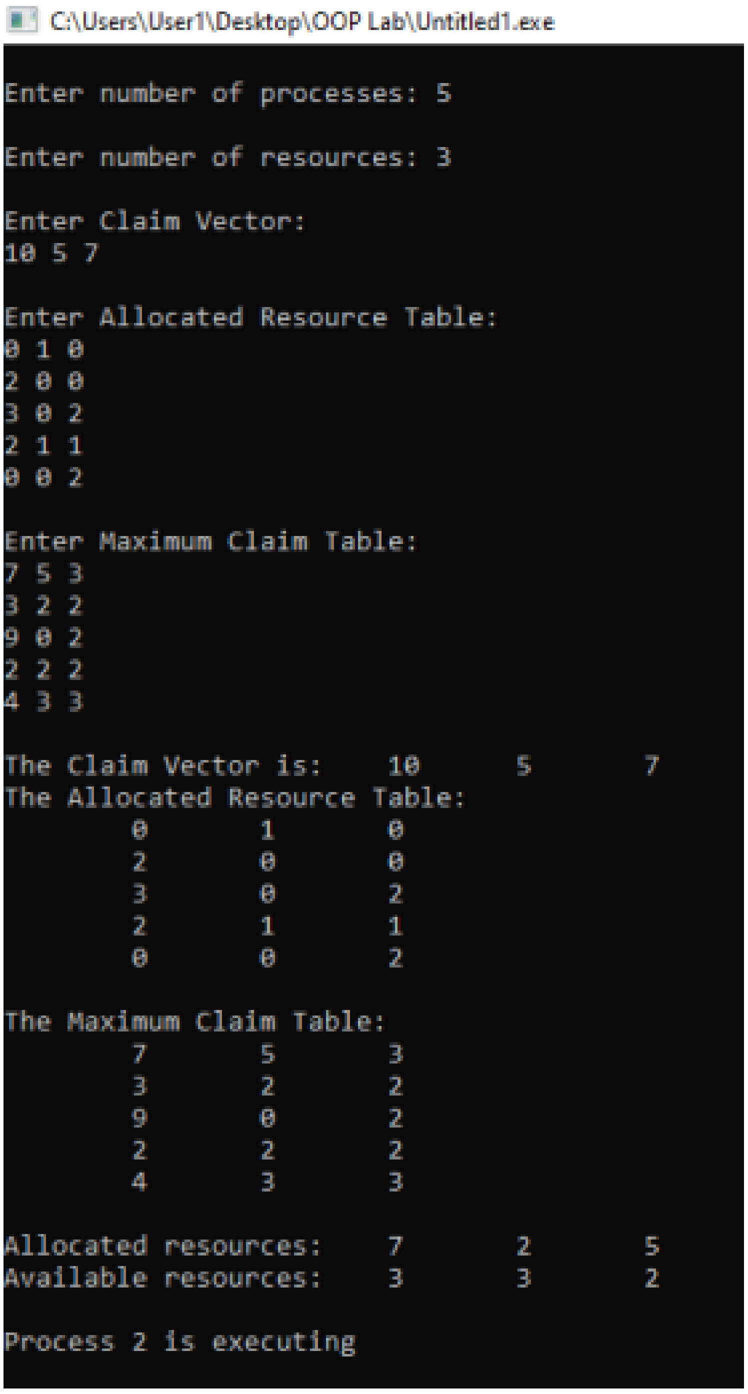
LAB 07

CODE:

```
#include <stdio.h>

int current[5][5], maximum_claim[5][5],
available[5]; int allocation[5] = {0, 0, 0, 0, 0};
int maxres[5], running[5], safe = 0;
 int counter = 0, i, j, exec, resources, processes;

int main() {
   printf("\nEnter number of processes: ");
   scanf("%d", &processes);

   for (i = 0; i < processes; i++) {
      running[i] = 1;
      counter++;
   }

   printf("\nEnter number of resources:
   "); scanf("%d", &resources);

   printf("\nEnter Claim Vector:\n");
   for (i = 0; i < resources; i++) {
      scanf("%d", &maxres[i]);
   }

   printf("\nEnter Allocated Resource
   Table:\n"); for (i = 0; i < processes; i++) {
      for (j = 0; j < resources; j++) {
         scanf("%d", &current[i][j]);
      }
   }

   printf("\nEnter Maximum Claim
   Table:\n"); for (i = 0; i < processes; i++) {
      for (j = 0; j < resources; j++) {
         scanf("%d", &maximum_claim[i][j]);
      }
   }

   printf("\nThe Claim Vector is:");
   for (i = 0; i < resources; i++) {
      printf("\t%d", maxres[i]);
   }

   printf("\nThe Allocated Resource Table:\n");
   for (i = 0; i < processes; i++) {
      for (j = 0; j < resources; j++) {
         printf("\t%d", current[i][j]);
      }
      printf("\n");
```

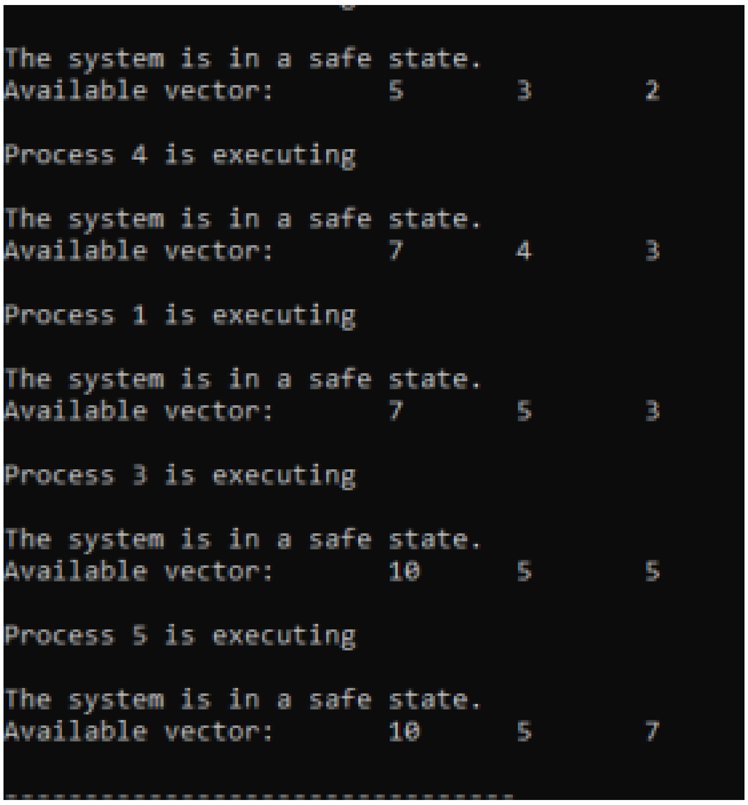
```
}

printf("\nThe Maximum Claim Table:\n");
for (i = 0; i < processes; i++) {
    for (j = 0; j < resources; j++) {
        printf("\t%d", maximum_claim[i][j]);
    }
    printf("\n");
}

for (i = 0; i < processes; i++) {
    for (j = 0; j < resources; j++) {
        allocation[j] += current[i][j];
    }
}

printf("\nAllocated resources:");
for (i = 0; i < resources; i++) {
    printf("\t%d", allocation[i]);
}

for (i = 0; i < resources; i++) {
    available[i] = maxres[i] - allocation[i];
}

printf("\nAvailable resources:");
for (i = 0; i < resources; i++) {
    printf("\t%d", available[i]);
}
printf("\n");

while (counter != 0) {
    safe = 0;
    for (i = 0; i < processes; i++) {
        if (running[i]) {
            exec = 1;
            for (j = 0; j < resources; j++) {
                if (maximum_claim[i][j] - current[i][j] > available[j]) {
                    exec = 0;
                    break;
                }
            }
            if (exec) {
                printf("\nProcess %d is executing\n", i + 1);
                running[i] = 0;
                counter--;
                safe = 1;

                for (j = 0; j < resources; j++) {
                    available[j] += current[i][j];
                }
                break;
            }
            }
        }

        if (!safe) {
            printf("\nThe processes are in an unsafe
            state.\n"); break;
        } else {
            printf("\nThe system is in a safe state.");
            printf("\nAvailable vector:");

            for (i = 0; i < resources; i++) {
                printf("\t%d", available[i]);
            }
            printf("\n");
        }
    }

    return 0;
}
```

OUTPUT:



C:\Users\User1\Desktop\OOP Lab\Untitled1.exe

```

Enter number of processes: 5

Enter number of resources: 3

Enter Claim Vector:
10 5 7

Enter Allocated Resource Table:
0 1 0
2 0 0
3 0 2
2 1 1
0 0 2

Enter Maximum Claim Table:
7 5 3
3 2 2
9 0 2
2 2 2
4 3 3

The Claim Vector is:    10      5       7
The Allocated Resource Table:
        0       1       0
        2       0       0
        3       0       2
        2       1       1
        0       0       2

The Maximum Claim Table:
        7       5       3
        3       2       2
        9       0       2
        2       2       2
        4       3       3

Allocated resources:    7       2       5
Available resources:    3       3       2

Process 2 is executing
```



```
The system is in a safe state.
Available vector:       5       3       2

Process 4 is executing

The system is in a safe state.
Available vector:       7       4       3

Process 1 is executing

The system is in a safe state.
Available vector:       7       5       3

Process 3 is executing

The system is in a safe state.
Available vector:       10      5       5

Process 5 is executing

The system is in a safe state.
Available vector:       10      5       7

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```