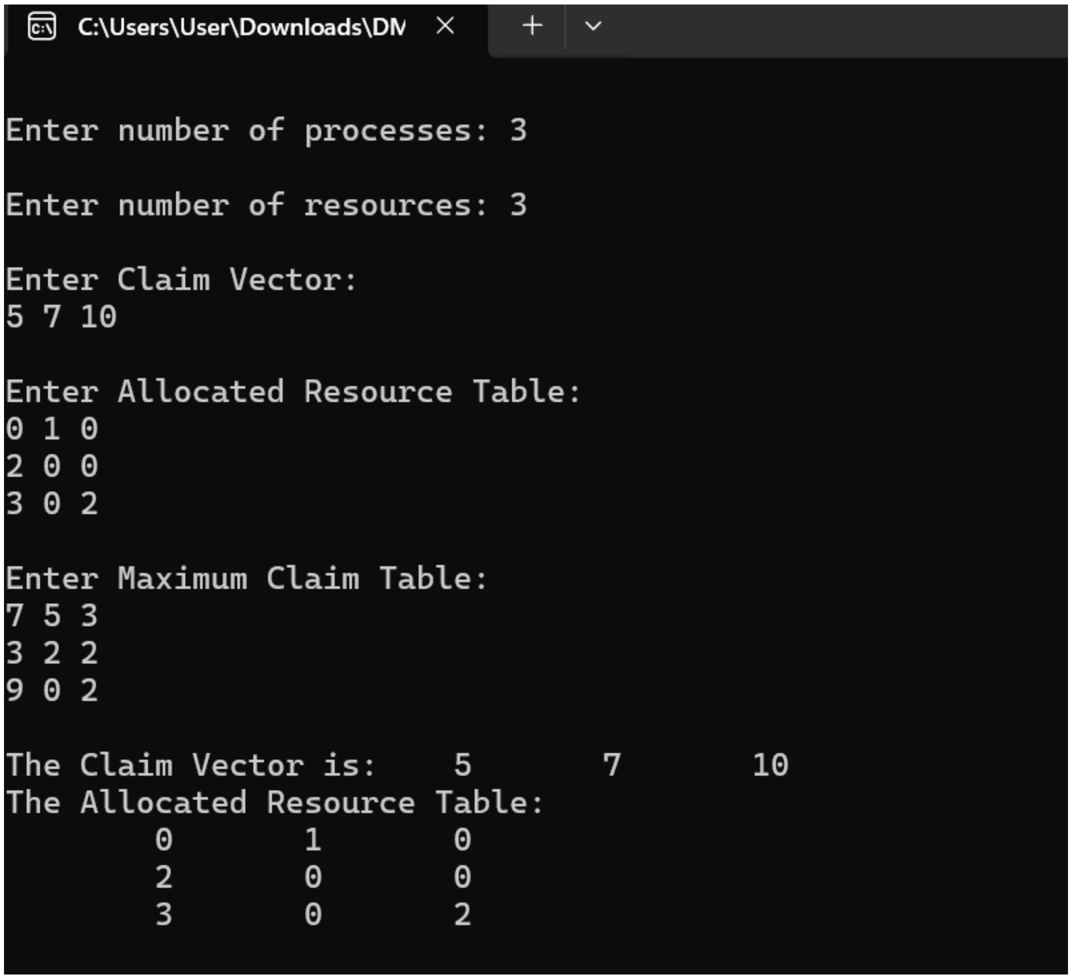
Lab-7

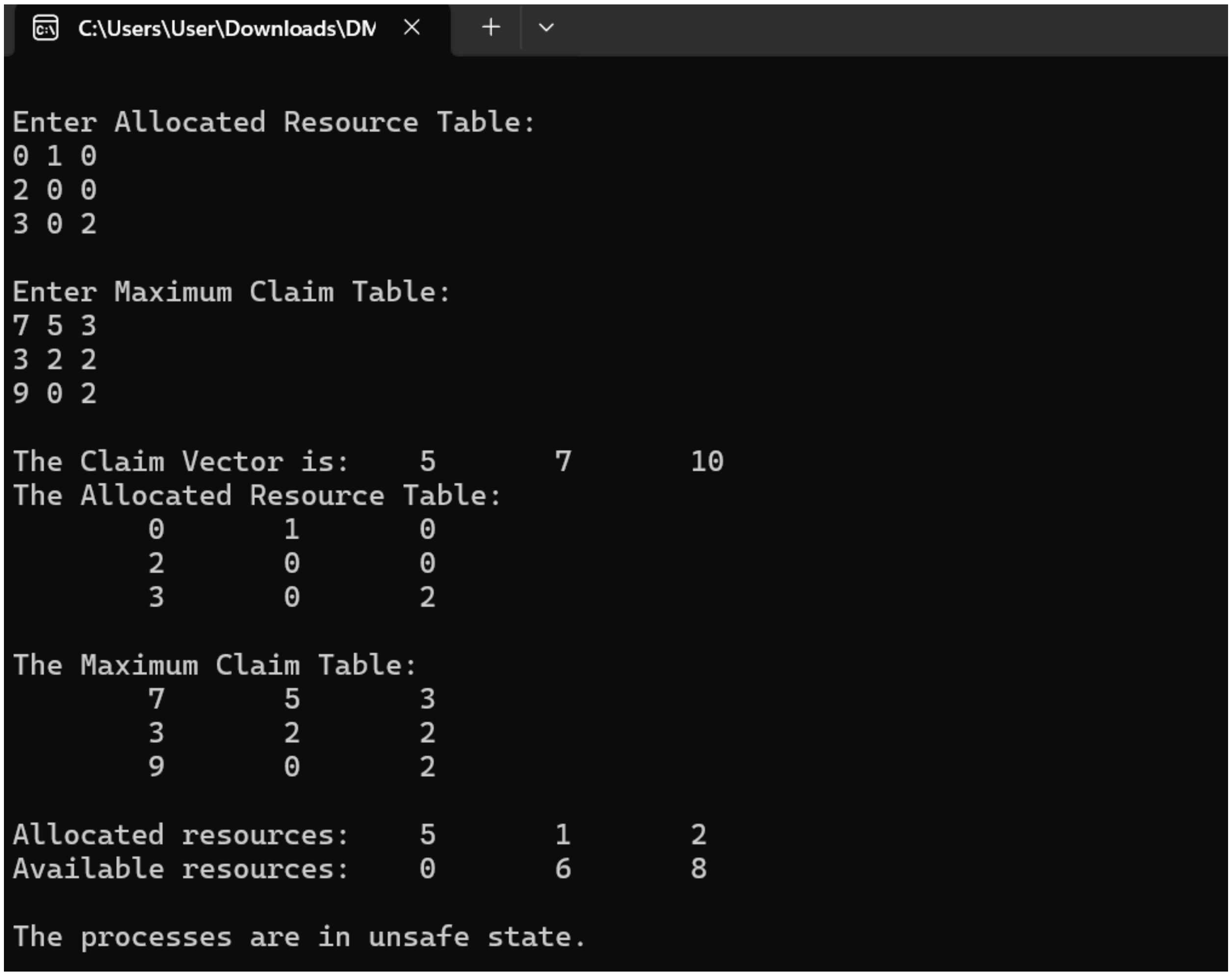
```
#include <stdio.h>

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");
}

// Calculate allocated resources
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]);
}

// Calculate available resources
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");

// Banker's algorithm
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", 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 unsafe state.\n");
        break;
    } else {
        printf("\nThe process is in a safe state.");
        printf("\nAvailable vector:");
        for (i = 0; i < resources; i++) {
            printf("\t%d", available[i]);
        }
        printf("\n");
    }
}

return 0;

}
```



```
Enter number of processes: 3

Enter number of resources: 3

Enter Claim Vector:
5 7 10

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

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

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



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

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

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

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

Allocated resources:    5       1       2
Available resources:    0       6       8

The processes are in unsafe state.
```