NAME:LAIBA NADEEM
ROLL NO: DT-22028

LAB 7

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#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, k = 1;

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: ");
   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];
}

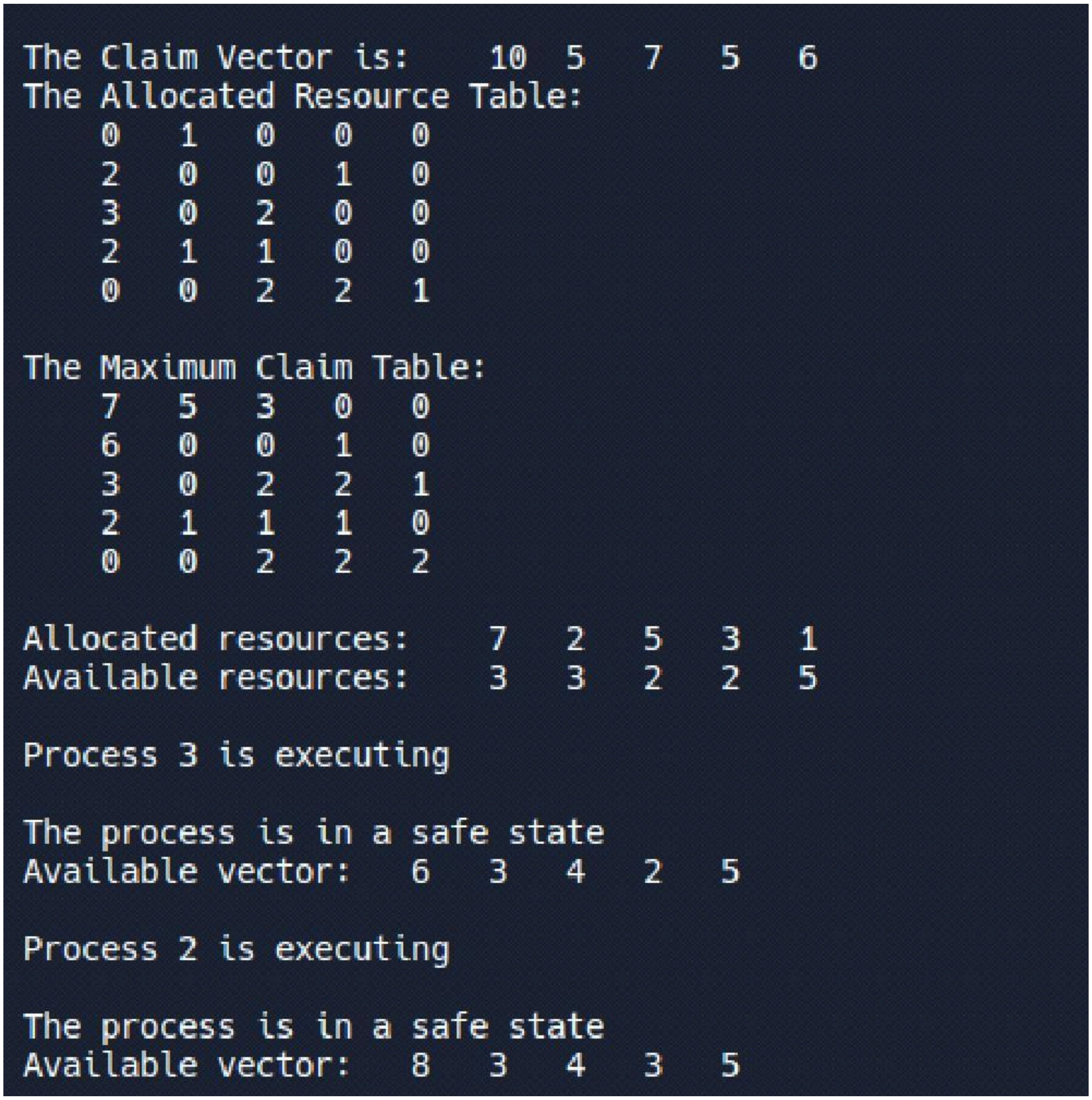
printf("\nAvailable resources:");
for (i = 0; i < resources; i++) {
    printf("\t%d", available[i]);
}

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 process is in a safe state");
            printf("\nAvailable vector:");
            for (i = 0; i < resources; i++) {
                printf("\t%d", available[i]);
            }
            printf("\n");
        }
    }

    return 0;
}
```



```
The Claim Vector is:    10  5   7   5   6
The Allocated Resource Table:
    0   1   0   0   0
    2   0   0   1   0
    3   0   2   0   0
    2   1   1   0   0
    0   0   2   2   1

The Maximum Claim Table:
    7   5   3   0   0
    6   0   0   1   0
    3   0   2   2   1
    2   1   1   1   0
    0   0   2   2   2

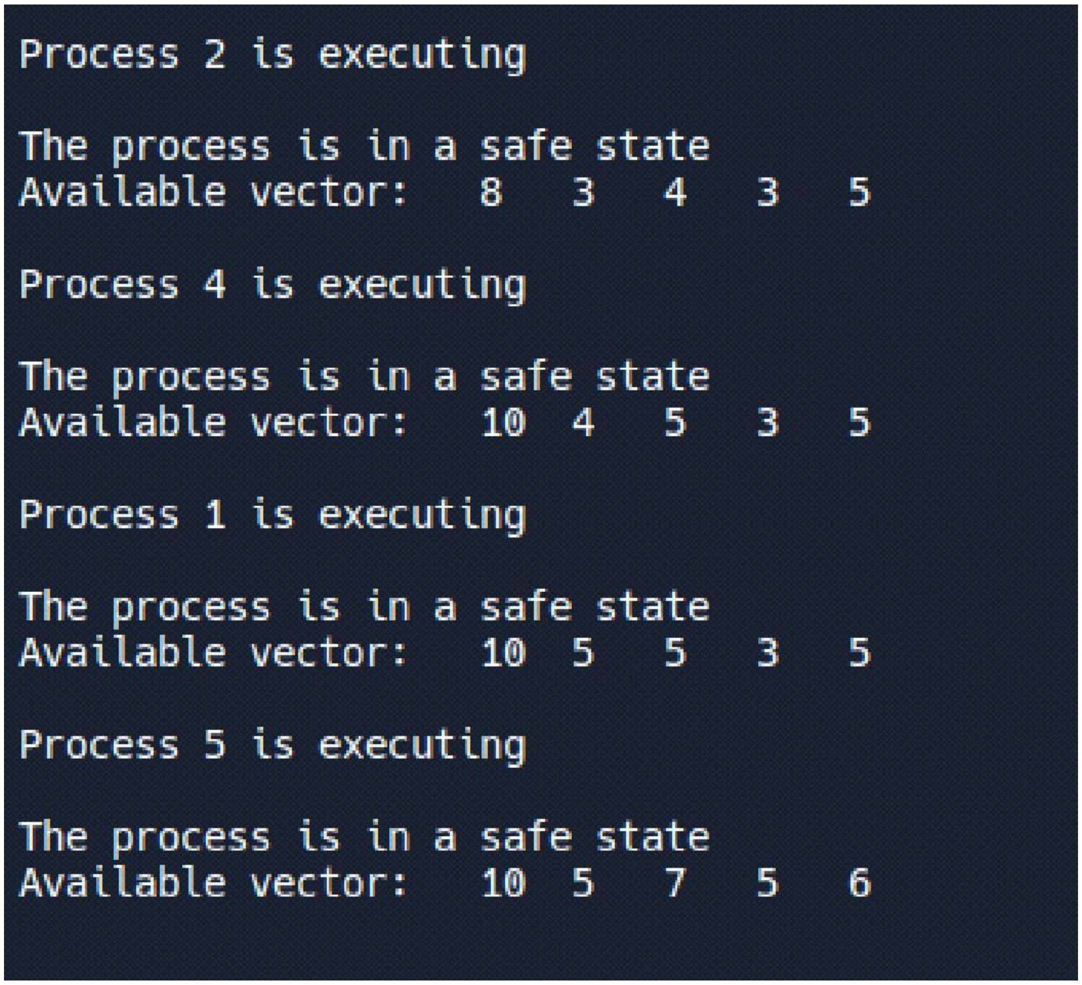
Allocated resources:    7   2   5   3   1
Available resources:    3   3   2   2   5

Process 3 is executing

The process is in a safe state
Available vector:   6   3   4   2   5

Process 2 is executing

The process is in a safe state
Available vector:   8   3   4   3   5
```



```
Process 2 is executing

The process is in a safe state
Available vector:   8   3   4   3   5

Process 4 is executing

The process is in a safe state
Available vector:   10  4   5   3   5

Process 1 is executing

The process is in a safe state
Available vector:   10  5   5   3   5

Process 5 is executing

The process is in a safe state
Available vector:   10  5   7   5   6
```