# Operating Systems
# CT-353

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# Lab 07:
# Banker's Algorithm

```
#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");
```

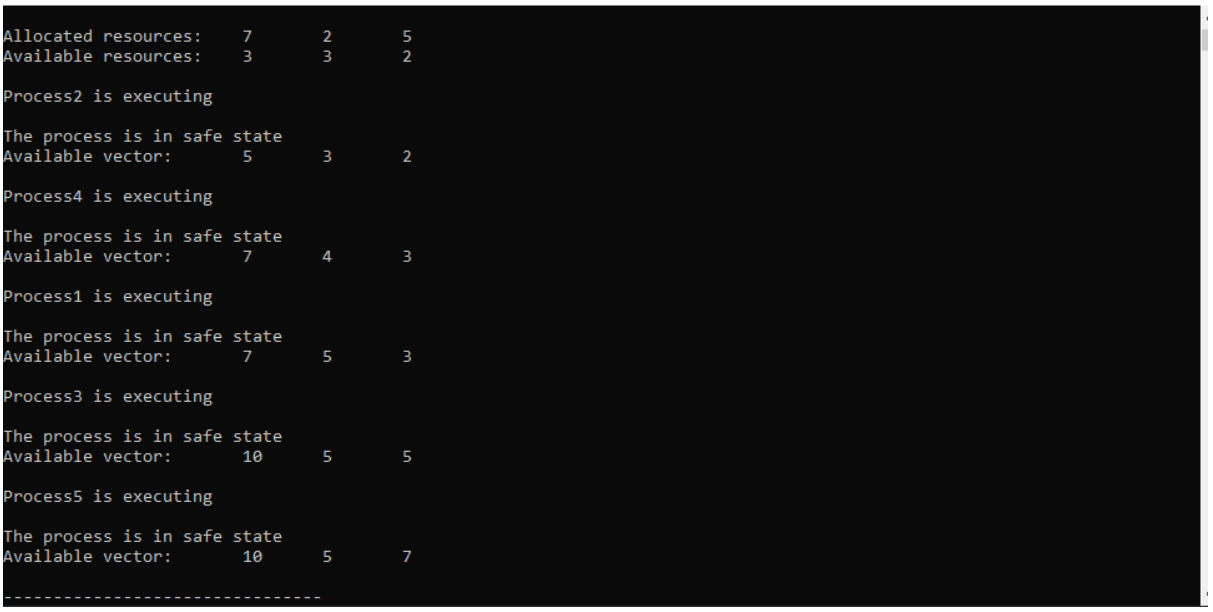
```
while (counter != 0)
{
    safe = 0;
    for (i = 0; i < processes; i++)
    {
        if (running[i])
        {
            exec = 1;
            for (j = 0; j < resources; j++)
            {
                if (maximum_claim[i][j] - current[i][j] > available[j])
                {
                    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 unsafe state.\n");
           break;
        }
        else
        {
           printf("\nThe process is in safe state");
           printf("\nAvailable vector:");
           for (i = 0; i < resources; i++)
           {
              printf("\t%d", available[i]);
           }
           printf("\n");
        }
     }
  return 0;
}
```

## Output:


Allocated resources: 7 2 5
Available resources: 3 3 2
Process2 is executing
The process is in safe state
Available vector: 5 3 2
Process4 is executing
The process is in safe state
Available vector: 7 4 3
Process1 is executing
The process is in safe state
Available vector: 7 5 3
Process3 is executing
The process is in safe state
Available vector: 10 5 5
Process5 is executing
The process is in safe state
Available vector: 10 5 7
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