EXPERIMENT 8

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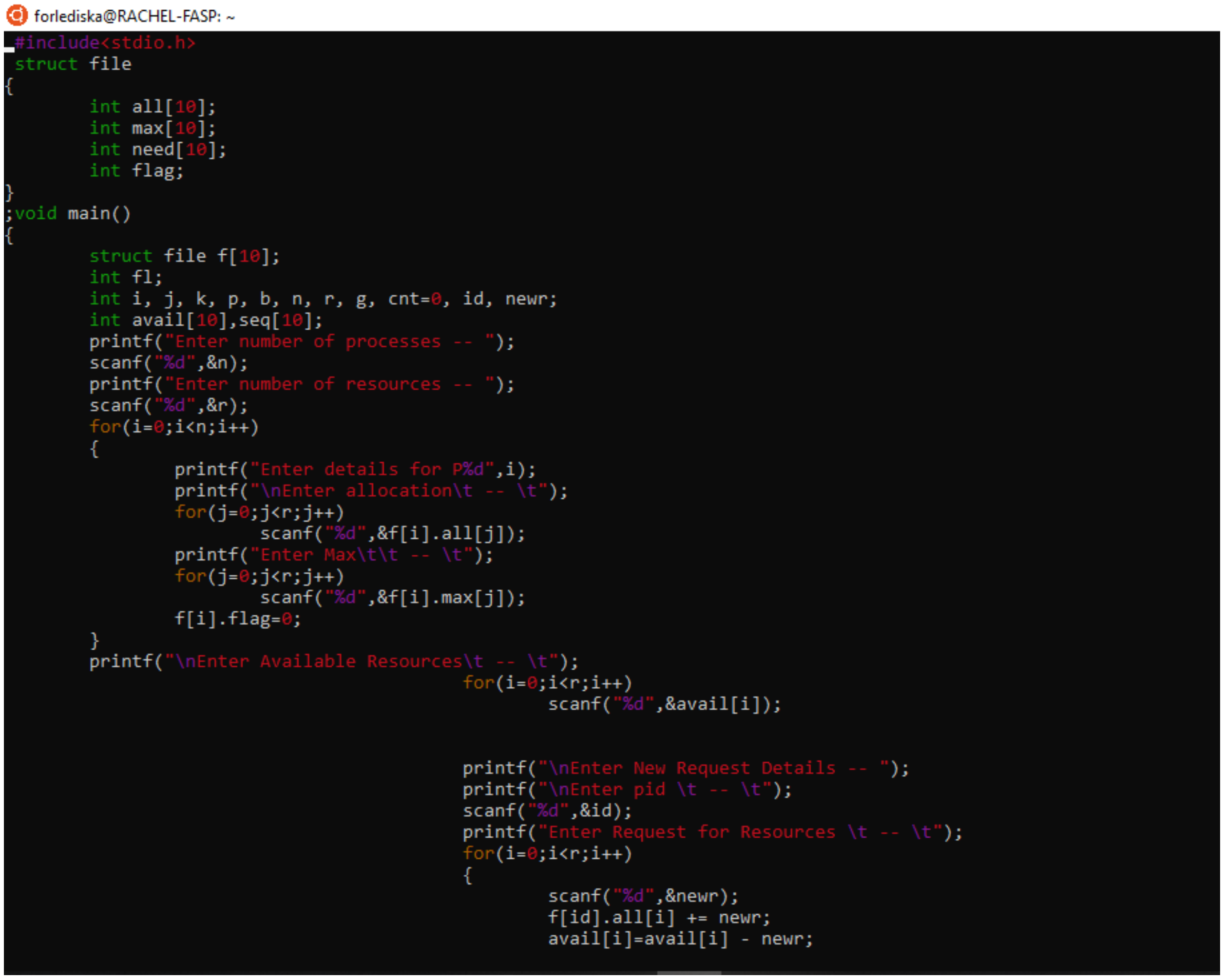
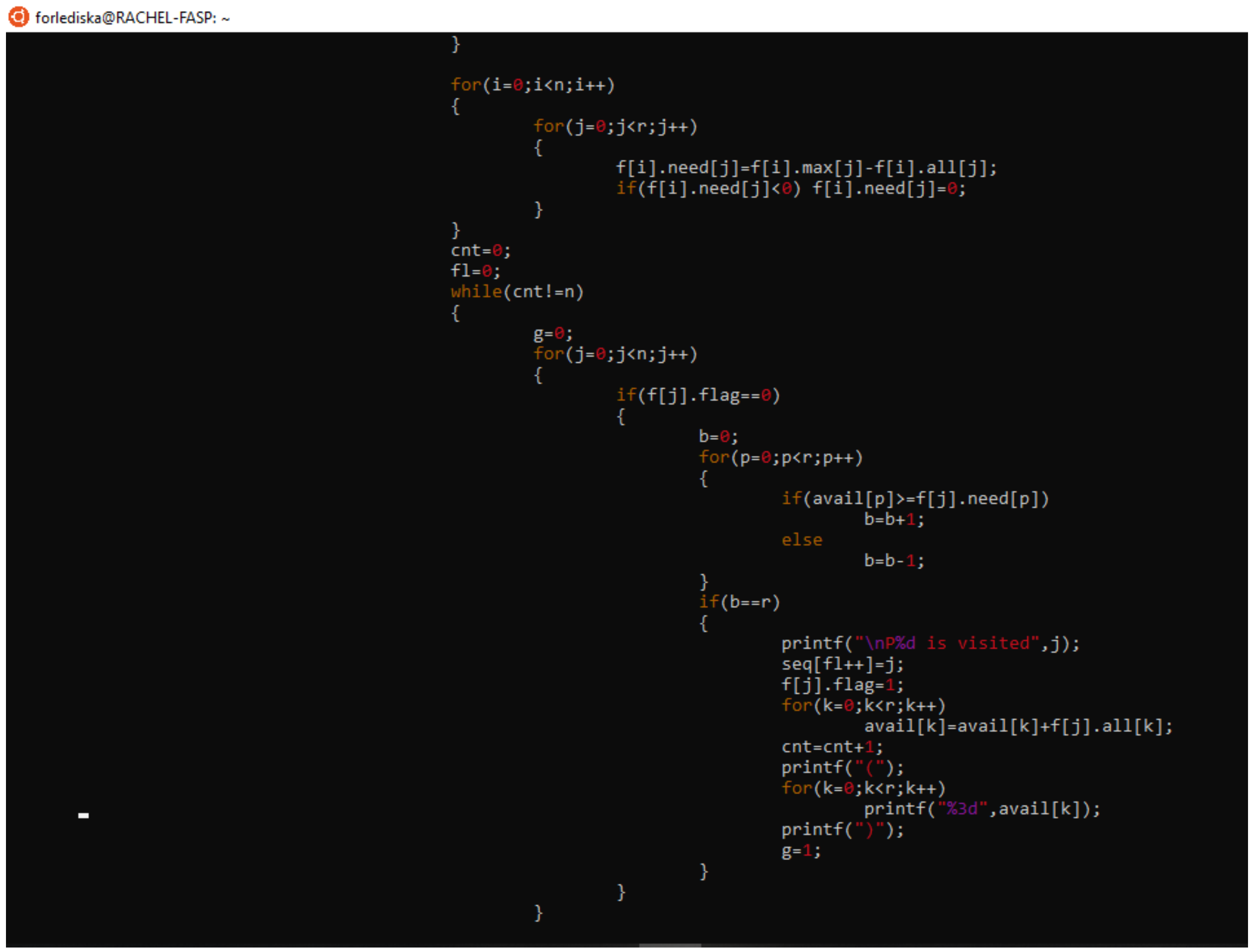


forlediska@RACHEL-FASP: ~

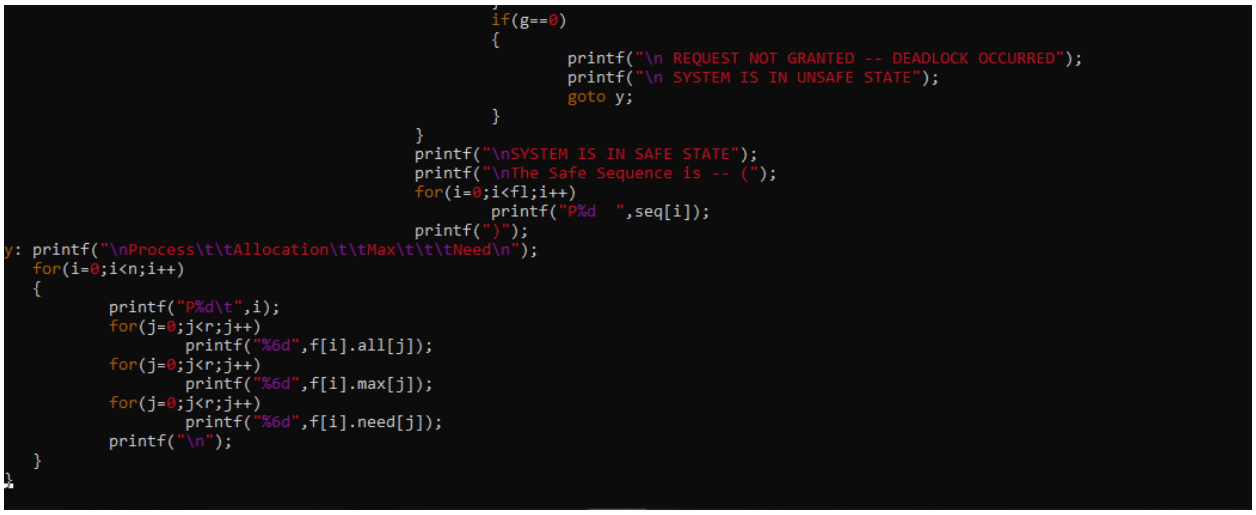
```
#include<stdio.h>
struct file
{
        int all[10];
        int max[10];
        int need[10];
        int flag;
}
;void main()
{
        struct file f[10];
        int fl;
        int i, j, k, p, b, n, r, g, cnt=0, id, newr;
        int avail[10],seq[10];
        printf("Enter number of processes -- ");
        scanf("%d",&n);
        printf("Enter number of resources -- ");
        scanf("%d",&r);
        for(i=0;i<n;i++)
        {
                printf("Enter details for P%d",i);
                printf("\nEnter allocation\t -- \t");
                for(j=0;j<r;j++)
                        scanf("%d",&f[i].all[j]);
                printf("Enter Max\t\t -- \t");
                for(j=0;j<r;j++)
                        scanf("%d",&f[i].max[j]);
                f[i].flag=0;
        }
        printf("\nEnter Available Resources\t -- \t");
                                                   for(i=0;i<r;i++)
                                                           scanf("%d",&avail[i]);


                                                   printf("\nEnter New Request Details -- ");
                                                   printf("\nEnter pid \t -- \t");
                                                   scanf("%d",&id);
                                                   printf("Enter Request for Resources \t -- \t");
                                                   for(i=0;i<r;i++)
                                                   {
                                                           scanf("%d",&newr);
                                                           f[id].all[i] += newr;
                                                           avail[i]=avail[i] - newr;
```

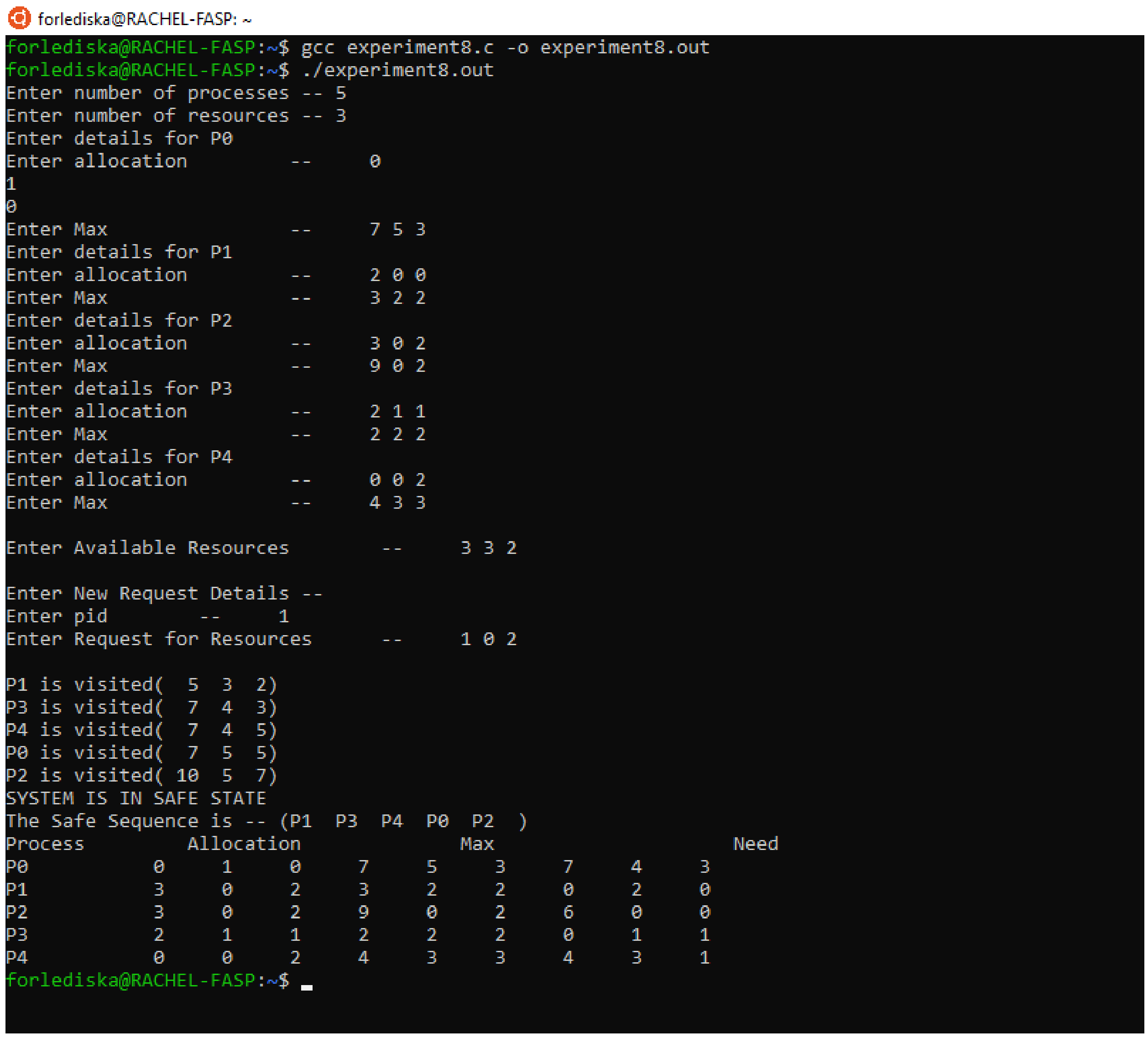


```
                                           }

                                           for(i=0;i<n;i++)
                                           {
                                                   for(j=0;j<r;j++)
                                                   {
                                                           f[i].need[j]=f[i].max[j]-f[i].all[j];
                                                           if(f[i].need[j]<0) f[i].need[j]=0;
                                                   }
                                           }
                                           cnt=0;
                                           fl=0;
                                           while(cnt!=n)
                                           {
                                                   g=0;
                                                   for(j=0;j<n;j++)
                                                   {
                                                           if(f[j].flag==0)
                                                           {
                                                                   b=0;
                                                                   for(p=0;p<r;p++)
                                                                   {
                                                                           if(avail[p]>=f[j].need[p])
                                                                                   b=b+1;
                                                                           else
                                                                                   b=b-1;
                                                                   }
                                                                   if(b==r)
                                                                   {
                                                                           printf("\nP%d is visited",j);
                                                                           seq[fl++]=j;
                                                                           f[j].flag=1;
                                                                           for(k=0;k<r;k++)
                                                                                   avail[k]=avail[k]+f[j].all[k];
                                                                           cnt=cnt+1;
                                                                           printf("(");
                                                                           for(k=0;k<r;k++)
                                                                                   printf("%3d",avail[k]);
                                                                           printf(")");
                                                                           g=1;
                                                                   }
                                                           }
                                                   }
```



```
                                                   if(g==0)
                                                   {
                                                           printf("\n REQUEST NOT GRANTED -- DEADLOCK OCCURRED");
                                                           printf("\n SYSTEM IS IN UNSAFE STATE");
                                                           goto y;
                                                   }
                                           }
                                           printf("\nSYSTEM IS IN SAFE STATE");
                                           printf("\nThe Safe Sequence is -- (");
                                           for(i=0;i<fl;i++)
                                                   printf("P%d  ",seq[i]);
                                           printf(")");
y: printf("\nProcess\t\tAllocation\t\tMax\t\t\tNeed\n");
   for(i=0;i<n;i++)
   {
           printf("P%d\t",i);
           for(j=0;j<r;j++)
                   printf("%6d",f[i].all[j]);
           for(j=0;j<r;j++)
                   printf("%6d",f[i].max[j]);
           for(j=0;j<r;j++)
                   printf("%6d",f[i].need[j]);
           printf("\n");
   }
}
```



```
forlediska@RACHEL-FASP:~$ gcc experiment8.c -o experiment8.out
forlediska@RACHEL-FASP:~$ ./experiment8.out
Enter number of processes -- 5
Enter number of resources -- 3
Enter details for P0
Enter allocation         --     0
1
0
Enter Max                --     7 5 3
Enter details for P1
Enter allocation         --     2 0 0
Enter Max                --     3 2 2
Enter details for P2
Enter allocation         --     3 0 2
Enter Max                --     9 0 2
Enter details for P3
Enter allocation         --     2 1 1
Enter Max                --     2 2 2
Enter details for P4
Enter allocation         --     0 0 2
Enter Max                --     4 3 3

Enter Available Resources        --     3 3 2

Enter New Request Details --
Enter pid        --      1
Enter Request for Resources      --     1 0 2

P1 is visited(  5  3  2)
P3 is visited(  7  4  3)
P4 is visited(  7  4  5)
P0 is visited(  7  5  5)
P2 is visited( 10  5  7)
SYSTEM IS IN SAFE STATE
The Safe Sequence is -- (P1  P3  P4  P0  P2  )
Process         Allocation              Max                     Need
P0           0     1     0     7     5     3     7     4     3
P1           3     0     2     3     2     2     0     2     0
P2           3     0     2     9     0     2     6     0     0
P3           2     1     1     2     2     2     0     1     1
P4           0     0     2     4     3     3     4     3     1
forlediska@RACHEL-FASP:~$ _
```