**Assignment 6**

**Name** : Komal Potdar

**Roll No**.: 92

**PRN No**.: 12320165

**Div**: CS B SY

**Batch**: 3

**Deadlock Detection**

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| #include <stdio.h>  #include <stdlib.h>  static int mark[20];  int i, j, np, nr;  int main()  {  int \*\*alloc, \*\*request, \*avail, \*r, \*f;  printf("\nEnter the no of the process: ");  scanf("%d", &np);  printf("\nEnter the no of resources: ");  scanf("%d", &nr);  alloc = (int \*\*)malloc(np \* sizeof(int \*));  request = (int \*\*)malloc(np \* sizeof(int \*));  avail = (int \*)malloc(nr \* sizeof(int));  r = (int \*)malloc(nr \* sizeof(int));  f = (int \*)malloc(np \* sizeof(int));  for(i = 0;i < np;i ++)  f[i] = 0;  for (i = 0; i < nr; i++)  {  printf("\nTotal Amount of the Resource R % d: ", i + 1);  scanf("%d", &r[i]);  }  printf("\nEnter the request matrix:");  for (i = 0; i < np; i++)  {  request[i] = (int \*)malloc(nr \* sizeof(int));  for (j = 0; j < nr; j++)  {  scanf("%d", &request[i][j]);  }  }  printf("\nEnter the allocation matrix:");  for (i = 0; i < np; i++)  {  alloc[i] = (int \*)malloc(nr \* sizeof(int));  for (j = 0; j < nr; j++)  {  scanf("%d", &alloc[i][j]);  }  }  /\*Available Resource calculation\*/  for (j = 0; j < nr; j++)  {  avail[j] = r[j];  for (i = 0; i < np; i++)  {  avail[j] -= alloc[i][j];  }  }  for (i = 0; i < nr; i++)  {  printf("Resc %d :: %d", i, avail[i]);  }  while (1)  {  int deadlock = 1;  for (i = 0; i < np ;i++){  int canBeProc = 1;  for (j = 0; j < nr; j++){  if (request[i][j] > avail[j]){  canBeProc = 0;  }  }  if (canBeProc){  deadlock = 0;  f[i] = 1;  for (j = 0; j < nr; j++){  avail[j] += alloc[i][j];  }  }  }  if (deadlock){  printf("\n Deadlock detected");  break;  }  int completed = 1;  for (i = 0; i < np ; i++){  if (f[i] == 0){  completed = 0;  }  }  if (completed){  printf("\n Deadlock not detected");  break;  }  }  } |

**Output:**

