**DeadLock Detection**

**#include <stdio.h>**

**#include <stdbool.h>**

**#define MAX 10**

**int main() {**

**int n, m, i, j;**

**int Allocation[MAX][MAX], Request[MAX][MAX], Available[MAX], Work[MAX];**

**bool Finish[MAX];**

**int safeSequence[MAX];**

**int safeIndex = 0;**

**printf("Processes: "); scanf("%d", &n);**

**printf("Resources: "); scanf("%d", &m);**

**printf("Allocation (%dx%d):\n", n, m);**

**for (i = 0; i < n; i++)**

**for (j = 0; j < m; j++)**

**scanf("%d", &Allocation[i][j]);**

**printf("Request (%dx%d):\n", n, m);**

**for (i = 0; i < n; i++)**

**for (j = 0; j < m; j++)**

**scanf("%d", &Request[i][j]);**

**printf("Available (%d):\n", m);**

**for (j = 0; j < m; j++)**

**scanf("%d", &Available[j]);**

**for (j = 0; j < m; j++) Work[j] = Available[j];**

**for (i = 0; i < n; i++) Finish[i] = false;**

**bool progress = true;**

**while (progress) {**

**progress = false;**

**for (i = 0; i < n; i++) {**

**if (!Finish[i]) {**

**bool canRun = true;**

**for (j = 0; j < m; j++)**

**if (Request[i][j] > Work[j]) {**

**canRun = false;**

**break;**

**}**

**if (canRun) {**

**for (j = 0; j < m; j++)**

**Work[j] += Allocation[i][j];**

**Finish[i] = true;**

**safeSequence[safeIndex++] = i;**

**progress = true;**

**}**

**}**

**}**

**}**

**bool deadlock = false;**

**for (i = 0; i < n; i++) {**

**if (!Finish[i]) {**

**deadlock = true;**

**printf("Deadlock detected! Process %d is deadlocked.\n", i);**

**}**

**}**

**if (!deadlock) {**

**printf("No deadlock detected.\nSafe Sequence: ");**

**for (i = 0; i < n; i++) {**

**printf("P%d ", safeSequence[i]);**

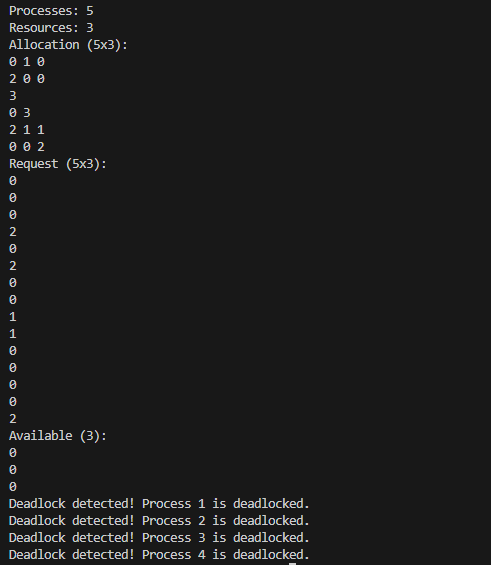
**}**

**printf("\n");**

**}**

**return 0;**

**}**

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