# Bansilal Ramnath Agarwal Charitable Trust’s

Vishwakarma Institute of Technology, Pune-37

*(Anautonomous Institute of Savitribai Phule Pune University)*



**Department of Computer Engineering**

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| **Division** | **CS** |
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* **Deadlock Detection, Deadlock Recovery**

#include <stdbool.h>

#include <stdio.h>

#define MAX\_PROCESSES 10

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int allocation[MAX\_PROCESSES][MAX\_RESOURCES];

int max[MAX\_PROCESSES][MAX\_RESOURCES];

int available[MAX\_RESOURCES];

bool marked[MAX\_PROCESSES];

int num\_processes, num\_resources;

bool isDeadlock() {

bool visited[MAX\_PROCESSES] = {false};

for (int i = 0; i < num\_processes; ++i) {

if (!marked[i] && !visited[i]) {

int work[MAX\_RESOURCES];

for (int j = 0; j < num\_resources; ++j) {

work[j] = available[j];

}

bool finish = false;

while (!finish) {

finish = true;

for (int j = 0; j < num\_processes; ++j) {

if (!visited[j] && !marked[j]) {

bool can\_allocate = true;

for (int k = 0; k < num\_resources; ++k) {

if (max[j][k] - allocation[j][k] > work[k]) {

can\_allocate = false;

break;

}

}

if (can\_allocate) {

for (int k = 0; k < num\_resources; ++k) {

work[k] += allocation[j][k];

}

visited[j] = true;

finish = false;

}

}

}

}

for (int j = 0; j < num\_processes; ++j) {

if (!visited[j] && !marked[j]) {

return true; // Deadlock detected

}

}

}

}

return false; // No deadlock detected

}

int main() {

printf("Enter number of processes: ");

scanf("%d", &num\_processes);

printf("Enter number of resources: ");

scanf("%d", &num\_resources);

printf("Enter allocation matrix:\n");

for (int i = 0; i < num\_processes; ++i) {

for (int j = 0; j < num\_resources; ++j) {

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

}

}

printf("Enter max matrix:\n");

for (int i = 0; i < num\_processes; ++i) {

for (int j = 0; j < num\_resources; ++j) {

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

}

}

printf("Enter available resources: ");

for (int i = 0; i < num\_resources; ++i) {

scanf("%d", &available[i]);

}

if (isDeadlock()) {

printf("Deadlock detected!\n");

} else {

printf("No deadlock detected.\n");

}

return 0;

}  
