include <stdio.h>

#define MAX\_COURSES 5

#define MAX\_OBJECTIVES 5

void inputMatrix(int matrix[MAX\_COURSES][MAX\_OBJECTIVES], int courses, int objectives) {

printf("Enter the course objective matrix:\n");

for (int i = 0; i < courses; i++) {

for (int j = 0; j < objectives; j++) {

printf("Matrix[%d][%d]: ", i + 1, j + 1);

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

}

}

}

void displayMatrix(int matrix[MAX\_COURSES][MAX\_OBJECTIVES], int courses, int objectives) {

printf("\nCourse Objective Matrix:\n");

for (int i = 0; i < courses; i++) {

for (int j = 0; j < objectives; j++) {

printf("%d ", matrix[i][j]);

}

printf("\n");

}

}

// Selection Sort for sorting rows by the sum of objectives

void sortMatrixSelection(int matrix[MAX\_COURSES][MAX\_OBJECTIVES], int courses, int objectives) {

int i, j, k, min\_idx, sum\_i, sum\_min, temp;

for (i = 0; i < courses - 1; i++) {

min\_idx = i;

sum\_min = 0;

for (k = 0; k < objectives; k++) {

sum\_min += matrix[min\_idx][k];

}

for (j = i + 1; j < courses; j++) {

sum\_i = 0;

for (k = 0; k < objectives; k++) {

sum\_i += matrix[j][k];

}

if (sum\_i < sum\_min) {

min\_idx = j;

sum\_min = sum\_i;

}

}

if (min\_idx != i) {

for (k = 0; k < objectives; k++) {

temp = matrix[i][k];

matrix[i][k] = matrix[min\_idx][k];

matrix[min\_idx][k] = temp;

}

}

}

}

// Bubble Sort for sorting rows by the sum of objectives

void sortMatrixBubble(int matrix[MAX\_COURSES][MAX\_OBJECTIVES], int courses, int objectives) {

int i, j, k, sum\_i, sum\_next, temp;

for (i = 0; i < courses - 1; i++) {

for (j = 0; j < courses - i - 1; j++) {

sum\_i = 0;

sum\_next = 0;

for (k = 0; k < objectives; k++) {

sum\_i += matrix[j][k];

sum\_next += matrix[j + 1][k];

}

if (sum\_i > sum\_next) {

for (k = 0; k < objectives; k++) {

temp = matrix[j][k];

matrix[j][k] = matrix[j + 1][k];

matrix[j + 1][k] = temp;

}

}

}

}

}

int main() {

int matrix[MAX\_COURSES][MAX\_OBJECTIVES];

int courses, objectives, choice;

printf("Enter the number of courses: ");

scanf("%d", &courses);

printf("Enter the number of objectives: ");

scanf("%d", &objectives);

inputMatrix(matrix, courses, objectives);

printf("Choose sorting method:\n");

printf("1. Selection Sort\n");

printf("2. Bubble Sort\n");

printf("Enter your choice (1 or 2): ");

scanf("%d", &choice);

if (choice == 1) {

sortMatrixSelection(matrix, courses, objectives);

printf("\nSorted using Selection Sort:\n");

} else if (choice == 2) {

sortMatrixBubble(matrix, courses, objectives);

printf("\nSorted using Bubble Sort:\n");

} else {

printf("Invalid choice.\n");

return 1;

}

displayMatrix(matrix, courses, objectives);

return 0;

}