# OLIMPIADA KOMBËTARE E INFORMATIKËS

## FAZA E TRETË

## Viti mësimor 2021-2022

**Zgjidhja e Ushtrimit 1:**

```
#include <iostream>
#include <vector>
using namespace std;
void printVector(vector<int> v) {
	for (int i=0; i<v.size(); i++) {
		cout << v[i] << " ";
	}
	cout << "\n";
}
bool sameFactor(int n1, int n2) {
	int b;
	if(n1 > n2) b=n1;
	else b=n2;
	for(int i=2; i < b; i++) {
		if ( (n1 % i == 0) && (n2 % i == 0) ) return true;
	}
	return false;
}
int main() {
	int n;
```

```
	vector<int> in;
	vector<int> out;
	cout << "Vendosni numrin n te elementeve ne vector, ku 1 <= n <=50 000:”<< endl;
	cin >> n;
	for (int i=0; i<n; i++) {
		int j=0;
	cout << "Vendosni elementet e vektorit:”<< endl;
		cin >> j;
		in.push_back(j);
	}
	for (int i=0; i < n; i++) {
		bool found = false;
		for(int j=i+1; j<n; j++) {
			if ( sameFactor(in[i], in[j]) ) {
				out.push_back(j);
				found = true;
				break;
			}
		}
		if (!found) out.push_back(-1);
	}
	printVector(out);
}
```

**Zgjidhja Ushtrimit 2:**

```
#include <bits/stdc++.h>
using namespace std;
int x = 4;
int y = 7;
int xx, yy, n;
void printMatrix(int m[4][7]) {
	for (int i=0; i<x; i++) {
```

```
                for (int j=0; j<y; j++) {
                        cout << m[i][j];
                }
                cout << endl;
        }
}

int main() {
        cout << "Matrica ka 4 rreshta dhe 7 kolona." << endl;
        cout << "Vendosni vlerat ne matrice:" << endl;

        int m[4][7];
        for (int i=0; i<4;i++) {
                for (int j=0; j<7; j++) {
                        int rowIn;
                        cin >> rowIn;
                        m[i][j] = rowIn;
                }
        }

        cin >> xx >> yy >> n;
        int temp = m[xx][yy];
        m[xx][yy] = n;
        for (int i=0; i<x; i++) {
                for (int j=0; j<y; j++) {
                        if( m[i][j] == temp ) {
                                m[i][j] = n;
                }
                }
        }

        printMatrix(m);
}
```

**Zgjidhja ushtrimi 3:**

```
#include <iostream>
#include <vector>
#include <algorithm>
#include <fstream>

using namespace std;
int r, k;
vector<vector<pair<int, int> > > grupet;
vector<pair<int, int> > temp;

int XYIndex(int x, int y){
	int rev[10] = {9, 8, 7, 6, 5, 4, 3, 2, 1, 0};
	return r*rev[y]+x;
}
bool in_bound(int x, int y){
	if(x < 0 || y < 0 || x > r-1 || y > k-1){
		return false;
	}
	return true;
}
void visit(vector<int> &v, int x, int y){

	v[XYIndex(x, y)] = 2;
	temp.push_back(make_pair(x, y));
	if(in_bound(x, y+1) && v[XYIndex(x, y+1)]==1) visit(v, x, y+1);
	if(in_bound(x+1, y) && v[XYIndex(x+1, y)]==1) visit(v, x+1, y);
	if(in_bound(x, y-1) && v[XYIndex(x, y-1)]==1) visit(v, x, y-1);
	if(in_bound(x-1, y) && v[XYIndex(x-1, y)]==1) visit(v, x-1, y);
}
```

```
int main(){
	//input
	int a, b;
	ifstream input("input.txt");
	input >> r >> k;
	vector<int> v(r*k, 0);
	while(!input.eof()){
		input >> a >> b;
		v[XYIndex(a, b)] = 1;
	}

	for(int i = 0; i <r; i++){
		for(int j =0; j<k; j++){
			temp.clear();
			if(v[XYIndex(i, j)]==1){
			visit(v, i, j);
			grupet.push_back(temp);
			}
		}
	}

	ofstream file("output.txt");
	file << "Ka gjithsej " << grupet.size() << " grupe " << endl << endl;
	for(int i = 0; i < grupet.size(); i++){
		file << "grupi " << i+1 << ": " << grupet[i].size() << " studente" << endl;
		for(int j=0; j < grupet[i].size(); j++){
			file << grupet[i][j].first << " " << grupet[i][j].second << endl;
		}
	}
	cout << "Output u realizua me sukses!" << endl;
}
```