Cycle Detection

Time Limit: 2 seconds

Problem Description

Given a directed graph $G = \langle V, E \rangle$, determine whether G contains a cycle. Note: a cycle can be viewed as a sequence $e_1 = (v_1, u_1), \ldots, e_{k-1} = (v_{k-1}, u_{k-1}), e_k = (v_k, u_0)$ of edges such that $v_i = u_{i-1}$ for $i \in \{1, \ldots, k\}$.

Technical Specifications

1. The number of test cases is no more than 20.
2. Basic: $2 \leq |V| \leq 100$.
3. Hard: $2 \leq |V| \leq 5000$, $2 \leq |E| \leq \min\{|V|^2, 20000\}$.

Input Format

The first line of the input file contains an integer indicating the number of test cases. The first line of each test case contains two integers n and m where n indicates $V = \{1, \ldots, n\}$ and $|E| = m$. The i-th of the following m lines contains two integers v, u indicating that the i-th edge is (v, u). Note: the integers in the same line are separated by blanks.

Output Format

For each test case, output `YES` if there exists a cycle in G. Otherwise, output `NO`.

Sample Input

```
2
1 1
1 1
3 3
1 2
2 3
1 3
```

Sample Output

```
YES
NO
```