British Informatics Olympiad Final

31 March – 2 April, 2006
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Record Time

One of the ways secrecy is maintained at Alpha Complex is through their bureaucracy. Information is available in records, many of which require information explained in other records. Each record is held by a single department, although the same department may hold multiple records.

The Alpha Complex spies have to demonstrate a 'need to know' before a given record can be read. This can only be done if the record explains information required by another record they have already read. Once a spy has come across information which is required but not explained, they will not stop until they have read the record explaining it. Spies have photographic memories and once they have read a record they remember its entire contents and never need to request it again.

For example, suppose record R1 (held in department D1) requires information in records R2 and R3, record R2 (in department D2) requires information in R4, and records R3 and R4 (both held in department D3) require no further information. A spy who needs to read R1, can go to D1 to read R1, then D3 to read R3, then D2 to read R2 and finally back to D3 to read R4. Alternatively, they could go to D1 and read R1, then D2 and read R2, then D3 to read both R3 and R4.

Alpha Complex is large and sprawling, and the departments are well spread out. The spies wish to minimise the number of trips between departments, so they can learn information in record time.

The first line of your input will contain a single integer r ($1 \leq r \leq 24$) indicating the number of records. Details on the records will then be given in order. The i^{th} record will start with a line containing two numbers: d_i ($1 \leq d_i \leq 24$) the department that holds this record, then f_i ($0 \leq f_i < r$) the number of other records containing information required by this record. This will be followed by f_i lines, each containing a single integer identifying a required record.

When spies join Alpha Complex there are required to read record 1. You should output a single integer, the length of the shortest sequence of trips to different departments to understand this record.

Sample Input

```
4
1 2
2
3
2 1
4
3 0
3 0
```

Sample Output

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3
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