Introduction to Computers and Programming

Homework 3

2023/09/26

1. Deadline

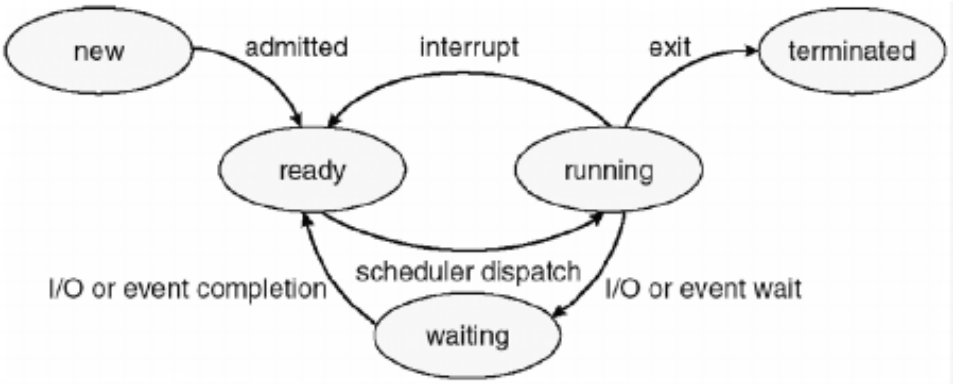
You have one week to complete the homework. Hand in your homework via E3 before 2023/10/03
23:55. In addition, make sure that your code can be executed on Visual Studio Community 2019.

2. Problem

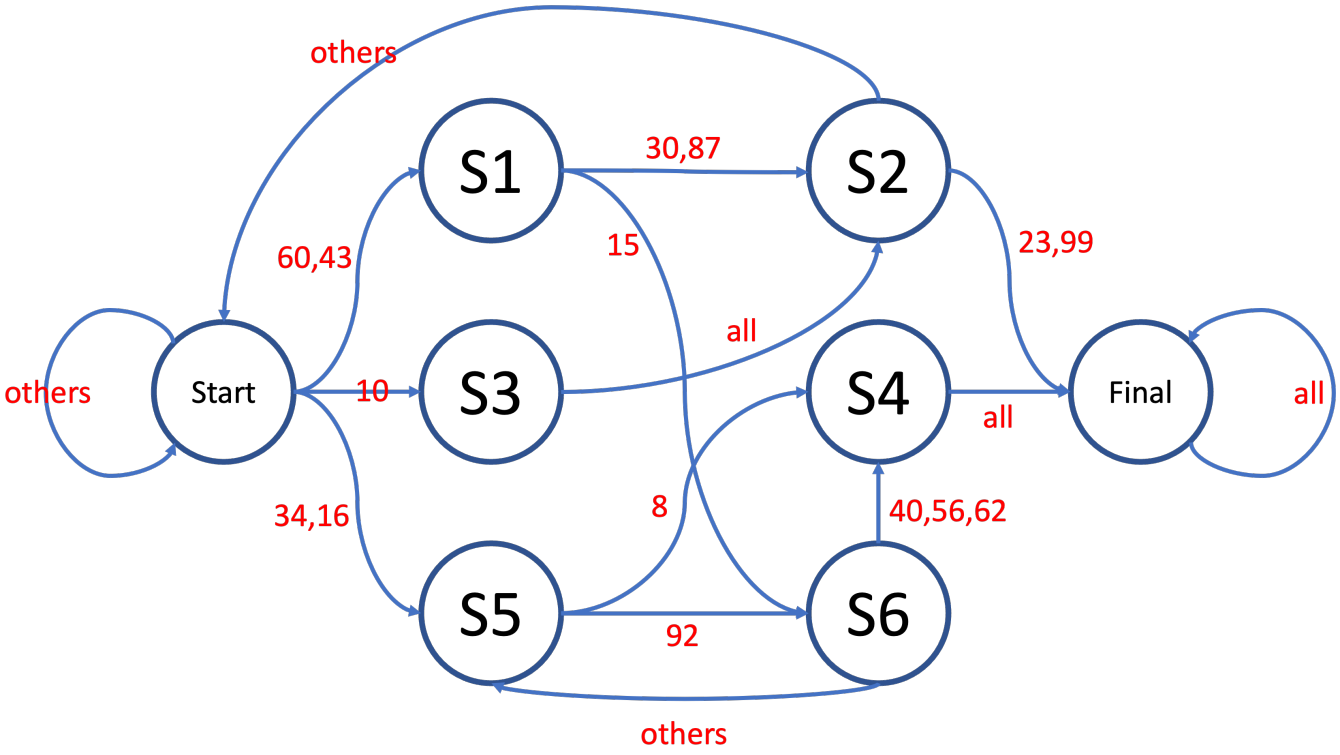
2.1 State Machine

A state machine consists of a finite number of states and is therefore also called finite-state machine (FSM). Based on the current state and a given input or conditions the machine performs state transitions and produces outputs.

For instance, we defines several states to indicate process state in operating system.



Now, I give you a state machine as below. In each testcase, I will give some numbers indicated state transition conditions as input and your initical state is at "Start". Please implement a program output which state is your final state.



Input

First line contains one integer N, indicated how many transition numbers.

Second line contains N integers and seperated by space, indicated transition number T_i .

- $1 \leq N \leq 10^8$
- $0 \leq T_i \leq 2^{31} - 1$
- Ensure series T_i follows state machine rule.

Output

Please output the last state after transition numbers.

Sample Input 1

```
5
34 92 8 8 10000
```

Sample Output 1

```
You are in Final.
```

Sample Input 2

```
17
1 1 1 1 1 1 1 1 60 15 1 92 1 92 1 92 1
```

```
You are in S5.
```

3. Submission format

```
xxxxxxxxx_hw_w03.zip
└─ xxxxxxxxx_hw_01.cpp
> xxxxxxxxx is your student id.
```