Problem G – Bus services

Little Long is now in team number X and currently participating in the ACM National Contest at FPT University campus located in Hoa Lac. It seems that his team is doing very well and will be very likely to be crowned the National Champion. They are planning that after the contest, they will return to the city centre to celebrate their victory. In order to go back to the city centre, they will take the buses to go along "Thang Long Avenue" from Hoa Lac to Hanoi centre.

The distance from Hoa Lac to Hanoi centre is 30 Km and there is a bus stop every 1 Km. Thus, there are 31 bus stops in total, numbered 0 to 30. The bus stop in Hoa Lac is numbered 0 and the bus stop in Hanoi numbered 30.

There are M bus services along the avenue numbered from 0 to $M-1$. We know that the speed of a bus is 60 Km/h (1 Km/min); we also know that the stop time at each bus stop is a negligible amount and could be ignored. To board a bus that leaves a bus stop at time t, they have to present at that bus stop before time t (i.e. time $t-1$ is the latest time that they have to present at the bus stop) or they have to wait for the next bus.

Each bus services do not stop at all the bus stops on its way. It will stop at some scheduled stops only. Each service also has its own starting time and its own frequency.

For example, there could be 4 bus services:

Bus service #0
Stop at 0, 6, 12, 18, 24
Start at time 10, every 60 minutes

Bus stop	0	6	12	18	24
1st bus	10	16	22	28	34
2nd bus	70	76	82	88	94
3rd bus	130	136	142	148	154

Bus service #1:
Stop at 16, 20, 24, 30
Start at time 26, every 120 minutes

Bus stop	16	20	24	30
1st bus	26	30	34	40
2nd bus	146	150	154	160
3rd bus	266	270	274	280

Bus service #2:
Stop at 15, 30
Start at time 68,
every 120 minutes

Bus stop	15	30
1st bus	68	83
2nd bus	188	203
3rd bus	308	313

Bus service #3:
Stop at 25, 26, 27, 28, 29, 30
Start at time 30, every 60 minutes

Bus stop	25	26	27	28	29	30
1st bus	30	31	32	33	34	35
2nd bus	90	91	92	93	94	95
3rd bus	120	121	122	123	124	125

These tables only contain the first 3 buses of each service in a day. Following buses will continue as scheduled and day change does not effect. It is possible that they have to walk along the avenue and their speed is 4 Km/h (1 Km/15 min). Please note that these bus services are **one-direction** because the returned buses go by a different route. With these services and the current time is 0. To travel from bus stop 0 to bus stop 30, they can have several options:

- At time 0, they start to walk 30 Kms. they will reach the destination in 450 minutes.
- Wait 10 minutes, take the service #0. Get off at bus stop 24 at time 34. Now, they can not take the first bus of service #1 because it will leave at time 34. They have to wait for 120