

Problem 1

Description:

You are given a scoring truth table, a sample data of 3 cyclers containing their spending time and %FTP during those time and also the planned session table where every interval is described as how many times a cyclist should spend in an interval, what should be his %FTP. Based on these criteria, You have to write code which will take input like sample data and check whether a cyclist could maintain the interval data provided in the Planned Session Interval table. E.g. Whether he maintained 3 min time with %FTP in between 50 and 60, whether he maintained 10s time with %FTP in between 250 and 350 and Finally Provide a Score of that cyclist comparing the Scoring Truth Table.

Scoring Truth Table:

Scoring Criteria	# points for 100% achievement (rounded to nearest 0.5 points)
Zone 2	3
Within target ranges for Z2 intervals within the Z2 main set	1
Within ranges for sprints (number of successful intervals/ total)	2
Hits target timing for intervals (high intensity interval duration and time between high intensity)	1
Hits above-mentioned target timing and starts first interval at right time	1
Warm up at right intensity and for at least duration stated	1
Warm down at right intensity and for at least duration stated	1

Sample Data:

Time elapsed in session in Seconds	Time elapsed in session in Minutes	Cyclist 1 - actual average power as % FTP (for preceding 5 seconds)	Cyclist 2 - actual average power as % FTP (for preceding 5 seconds)	Cyclist 3 - actual average power as % FTP (for preceding 5 seconds)
	0	50%	40.0%	40%
5		50%	40.0%	50%
10		50%	40.0%	50%
15		50%	40.0%	50%
20		50%	40.0%	50%
25		50%	40.0%	50%
30		50%	40.0%	50%
35		50%	40.0%	50%
40		50%	40.0%	50%
45		50%	40.0%	50%
50		50%	40.0%	50%
55		50%	40.0%	50%
	1	50%	40.0%	50%
5		50%	40.0%	50%
10		50%	40.0%	50%
15		50%	40.0%	50%
20		50%	40.0%	50%
25		50%	40.0%	50%
30		50%	40.0%	50%
35		50%	40.0%	50%
40		50%	40.0%	50%
45		50%	40.0%	50%
50		50%	40.0%	50%
55		50%	40.0%	50%
	2	50%	40.0%	50%

5		50%	40.0%	50%
10		50%	40.0%	50%
15		50%	40.0%	50%
20		50%	40.0%	50%
25		50%	40.0%	50%
30		50%	40.0%	50%
35		50%	40.0%	50%
40		50%	40.0%	50%
45		50%	40.0%	50%
50		50%	40.0%	50%
55		50%	40.0%	50%
	3	50%	40.0%	50%
5		250%	375.0%	50%
10		250%	375.0%	50%
15		65%	55.0%	250%
20		65%	55.0%	250%
25		65%	55.0%	65%
30		65%	55.0%	65%
35		65%	55.0%	65%
40		65%	55.0%	65%
45		65%	55.0%	65%
50		65%	55.0%	65%
55		65%	55.0%	65%
	4	65%	55.0%	50%
5		250%	350.0%	250%
10		250%	350.0%	250%
15		65%	55.0%	65%
20		65%	55.0%	65%
25		65%	55.0%	65%
30		65%	55.0%	65%
35		65%	55.0%	65%
40		65%	55.0%	65%
45		65%	55.0%	65%
50		65%	55.0%	65%
55		65%	55.0%	65%
	5	65%	55.0%	65%
5		250%	150.0%	250%
10		250%	150.0%	250%
15		65%	55.0%	65%
20		65%	55.0%	65%
25		65%	55.0%	65%

30		65%	55.0%	65%
35		65%	55.0%	65%
40		65%	55.0%	65%
45		65%	55.0%	65%
50		65%	55.0%	65%
55		65%	55.0%	65%
	6	65%	55.0%	65%
5		250%	100.0%	300%
10		250%	100.0%	300%
15		65%	55.0%	65%
20		65%	55.0%	65%
25		65%	55.0%	65%
30		65%	55.0%	65%
35		65%	55.0%	65%
40		65%	55.0%	65%
45		65%	55.0%	65%
50		65%	55.0%	65%
55		65%	55.0%	65%
	7	65%	55.0%	65%
5		250%	55.0%	300%
10		250%	55.0%	300%
15		65%	55.0%	65%
20		65%	55.0%	65%
25		65%	55.0%	65%
30		65%	55.0%	65%
35		65%	55.0%	65%
40		65%	55.0%	65%
45		65%	55.0%	65%
50		65%	55.0%	65%
55		65%	55.0%	65%
	8	50%	40.0%	65%
5		50%	40.0%	65%
10		50%	40.0%	65%
15		50%	40.0%	65%
20		50%	40.0%	65%
25		50%	40.0%	65%
30		50%	40.0%	65%
35		50%	40.0%	65%
40		50%	40.0%	65%
45		50%	40.0%	65%
50		50%	40.0%	65%

55		50%	40.0%	65%
	9	50%	40.0%	65%
5		50%	40.0%	50%
10		50%	40.0%	50%
15		50%	40.0%	50%
20		50%	40.0%	50%
25		50%	40.0%	50%
30		50%	40.0%	50%
35		50%	40.0%	50%
40		50%	40.0%	50%
45		50%	40.0%	50%
50		50%	40.0%	50%
55		50%	40.0%	50%
	10	50%	40.0%	50%

Planned Session Interval segregation:

Interval	Time in mins	Time in secs	% FTP lower	% FTP Upper
Warm Up(Z1)	3	0	50	60
Sprint(Z7)		10	250	350
Z2		50	65	70
Sprint(Z7)		10	250	350
Z2		50	65	70
Sprint(Z7)		10	250	350
Z2		50	65	70
Sprint(Z7)		10	250	350
Z2		50	65	70
Sprint(Z7)		10	250	350
Z2		50	65	70
Warm Down(Z1)	2	0	50	55

Zones	% FTP - lower bound	% FTP - Upper bound
1	48	60
2	61	73
3	74	87
4	88	100
5	101	120
6	121	150
7	151	10000

Actual performance - scenario description:

Cyclist 1	Score > 18	Hits the levels for perfect performance - just
Cyclist 2	Score > 9	Enthusiastic start and trails off
Cyclist 3	Score < 9	Intervals are late but gets to right levels

Problem 2

Description:

You are given a constraint table of some Rides which contains Priority Number($P_1 \dots P_n$), Duration (t_1, t_2, \dots, t_n), Intensity (i_1, i_2, \dots, i_n), A Score(s_1, s_2, \dots, s_n). You are also given Rider's available hours of a day in a week(at_1, at_2, \dots, at_7). You have to set ride for the riders which will fulfill the rules which are given below:

RULES:

- You have to set a priority ride first. Lower priority ride will get picked if there's no other way to fit higher priority ride
- You can't set a ride which duration will surpass rider's available hours on a specific day (~~BUT you can break the hours and partially set the ride for that day and rest hours in other day~~)
- You can set more than one ride in a day if there's available hours left
- Remember the ride you set, total Score of those rides can't be greater than his Maximum Score in day
- Same goes for Intensity
- You can't set two high intensity rides back to back day.

Available Rides Table:

Ride Id	Priority Ride Number	Duration(In hours)	Intensity	Score
1	1	7	0.2	40
2	2	4	0.1	15
3	3	1	0.2	25
4	4	3	0.1	10
5	5	2	0.3	18

User's Daily Max Capability:

Day	Available Hour	Max Intensity	Max Score
Monday	3	0.4	40
Tuesday	1	0.1	50
Wednesday	4	0.3	30
Thursday	1	0.5	60
Friday	2	0.2	25
Saturday	4	0.6	20
Sunday	6	0.2	45

Solution:

Day	Ride Id
Monday	5
Tuesday	
Wednesday	2
Thursday	3
Friday	
Saturday	4
Sunday	1