8.2.1

The algorithm should be like this:

Rent first and after few days if still want play ski, then buy it.

The days for rent should be less than or equal to 10 days, because buying a ski only cost 10 days rent fee.

10 days rent and then buy it total cost: 10 × 10 + 100 = 200, 200/11 per day.

Competitive ratio is 10/ (100/11) = 0.55

9 days 9 × 10 + 100 = 190, 190/10 = 19 per day

Competitive ratio: 10/19 = 0.52

…

…

1 days rent 1 × 10 + 100 = 110, 110/2=55 per day

Competitive ratio: 10/55 = 0.18

8.3.1

1. For the best match should be
2. For the best match should be

8.4.1

We use the BALANCE algorithm, each time when there’re multiple options for selecting an advertiser, select the one with largest unspent budget.

In this algorithm, the worst case is that each time we unluckily select the advertiser with multiple option, and it may result in more spaces without ad and thus no revenue, but we can still get the order of it. This also generate 4 of 6 for the revenue. So the algorithm will generate at least 4 of 6 queries.

9.2.1

1. if α =β =1

1. if α =0.01 and β =0.5

9.3.1

(e)

average(A) = 2.5

average(B) = 1.75

average(C) = 2.25

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  | 1.5 | 2.5 | -2.5 | 2.5 | -1.5 | -2.5 | 0.5 | -0.5 |
|  | -1.75 | 1.25 | 2.25 | 1.25 | -0.75 | 0.25 | -0.75 | -1.75 |
|  | -0.25 | -2.25 | -1.25 | 0.75 | -2.25 | 1.75 | 2.75 | 0.75 |

(f)