

Class BatteryCharger

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1  /**
2   * 2009 FR #3 solution based on that from Litvin
3   */
4  public class BatteryCharger
5  {
6   /** rateTable has 24 entries representing the charging costs for hours 0 through 23. */
7   private int[] rateTable;
8
9   //default constructor for testing
10  public BatteryCharger()
11  {
12      int temp[] = {50,60,160,60,80,100,100,120,150,150,150,200,40,240,220,220,200,200,180,180,140,10
13  0,80,60};
14      rateTable = temp;
15  }
16  //constructor for use with premade array of data
17  public BatteryCharger(int[] aTable)
18  {
19      rateTable = aTable;
20  }
21
22  //methods
23  /** Determines the total cost to charge the battery starting at the beginning of startHour.
24   * @param startHour the hour at which the charge period begins
25   * Precondition: 0 ≤ startHour ≤ 23
26   * @param chargeTime the number of hours the battery needs to be charged
27   * Precondition: chargeTime > 0
28   * @return the total cost to charge the battery
29   */
30  public int getChargingCost(int startHour, int chargeTime)
31  {
32      int cost = 0;
33  }
```

```
34     for (int hour = 0; hour < chargeTime; hour++)
35     {
36         cost += rateTable[(startHour + hour) % 24];
37     }
38
39     return cost;
40 }
41
42
43 /** Determines start time to charge the battery at the lowest cost for the given charge time.
44  * @param chargeTime the number of hours the battery needs to be charged
45  * Precondition: chargeTime > 0
46  * @return an optimal start time, with  $0 \leq$  returned value  $\leq 23$ 
47  */
48 public int getChargeStartTime(int chargeTime)
49 {
50     int bestStartHour = 0; //start on 0 hour
51     int minCost = getChargingCost(0, chargeTime); //start on 0 hour
52
53     for (int hour = 1; hour < 24; hour++)
54     {
55         int cost = getChargingCost(hour, chargeTime);
56         if (cost < minCost)
57         {
58             bestStartHour = hour;
59             minCost = cost;
60         }
61     }
62
63     return bestStartHour;
64 }
65
66
67 }
```

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