Problem 6: Easter Basket – A CLASS-BASED PROBLEM

Overview

“Everybody” knows that Santa Claus has a cadre of elves who create the toys that he delivers each Christmas. Less frequently discussed is that those same elves must “pack” Santa’s bags each December before that magical trip on Christmas Eve. Much less well known, however, is that the Easter Bunny has a cadre of dwarves who perform similar tasks for him, enabling untold numbers of children to receive an Easter basket of goodies each spring. Even as you are competing in this contest, the dwarves are filling baskets in preparation for delivery next month.

Problem

In this problem, you will simulate a single dwarf working throughout his shift. Each workstation has a number of benches that can hold some number (varies by workstation) of baskets. Each workstation also sits next to two conveyor belts – one incoming and one outgoing. Empty baskets (of varying sizes) and goodies (also of varying sizes) arrive on the incoming belt in response to worker requests. Completed baskets are placed on the outgoing belt for eventual delivery by the Easter Bunny. At the beginning of a shift, the worker requests enough baskets to fill the bench. The worker then requests goodies and places them into baskets, always placing the goody into the basket that will have the most space remaining after the goody is inserted. (It does not matter how ties are broken.) If the goody will not fit in any basket, then the basket with the least space remaining (it doesn’t matter how ties are broken) is placed on the outgoing belt and a new basket is requested on the incoming belt. This process is repeated until the end of the shift – indicated by a goody whose size is zero. At that point, all non-empty baskets are placed on the outgoing belt and the dwarf’s work for the day is done. Note that it may be necessary to request more than one basket in a row during a shift, but the magic of the Easter Bunny guarantees that it will never be necessary to place an empty basket on the outgoing belt. Note also that dwarves have only two hands, so baskets and goodies must be requested on a need-only basis or one or the other will end up on the floor – and we can’t have that kind of waste! As he leaves, the dwarf reports how many baskets he filled (placed on the outgoing belt) during his shift.

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**Input**

The input consists of a single line of text containing worker ID (positive integer less than 10000) and the number of days until Easter (will be between 0 and 351 inclusive) in that order. The numbers will be separated by a single space. [Note: lower numbers will result in shorter shifts; this does not matter for correctness, but may make debugging easier.]

**Output**

The output is the output produced by calling the `shutDown()` method for the factory. [Note: this method prints the output on its own, so there is no need for your code to print anything!]

**About the class**

You must use the `EasterBasket`, `EasterBasketWorkstation`, and `Goodie` classes in your solution to this problem. Otherwise, you will not be able to know the setup of the baskets nor the sizes of the goodies nor the order in which they arrive. All of the necessary methods are provided for you (although you may not need to use everything that is provided). Be sure to pay close attention to documentation of the class, including the pre- and post-conditions for all of the methods.

**Example 1**

**Input**

```
10 10
```

**Output** (Font size changed to show output is on one line only.)

```
Plant shut down smoothly. 7 baskets processed. Confirmation code: 138
```

**Example 2**

**Input**

```
2019 162
```

**Output** (Font/margin size changed to show output is on one line only.)

```
Plant shut down smoothly. 335 baskets processed. Confirmation code: 333143
```