*Apollo Labs – Technical Interview*

Box packing plays a large role in Target’s global supply chain. The types and sizes of boxes we use day-to-day have a direct impact on our bottom line (cost). Over the past few years, the Apollo Labs team has built several “prototypes” that help answer questions related to box packing.

We’ve laid out a basic box packing problem below for you to solve in a programming language of your choice. *We recommend that you take about 1 hour to complete the problem. Bring your laptop to your Friday interview—we will walk through your solution then!*

Assume you have an infinite number of boxes with the below dimensions:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Length (inches) | Width (inches) | Height (inches) | Cubic Volume (inches) | Cubic Volume (feet) |
| 14 | 20 | 9.75 | 2730 | 1.58 |

1. Develop and implement an approach in the programming language of your choice to assign items (from the items.csv file) into boxes with the above dimensions using the least amount of boxes.
   * The output of your code should detail which items were assigned into which boxes.
   * Constraints: No box can have an aggregate volume greater than its capacity (cubic volume)

Bonus: Save your code that answers question 1 and modify it so each box can only include items within the same group type.

Things to consider:

* How do you know that your solution is not assigning too many items to a box?
* Is it easy for you to determine how full an average box is?
* Would you rethink your solution if the items.csv file was 5 million records?

During the interview, we will review your solution to the question above. Make sure to bring any materials needed to present your solution (i.e. laptop… we’ll have a room with a projector). We’ll also spend some time white boarding and discussing extensions to the problem.