

# OOA Exercise

- Revisit last tutorial's problem and see how the OOA process is carried out
- Keywords in the requirements are highlighted
  - Why are they highlighted?
  - What are their purposes?
- Find relevant keywords, that is useful and related information for the intended system
- Discover the use cases and from which to extract more classes

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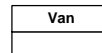
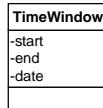
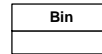
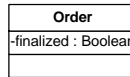
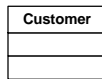
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# Requirements Part 1

- Customers order a set of items for delivery within a specific time window on a specific day (the time windows are 9-12, 12-3, 3-6, 6-9). All orders are finalized at 11 p.m. the previous day, and may not be changed after that time.
- Orders are delivered to customers using a fleet of cube vans. Individual orders are carried in the vans in two types of 12 cubic foot bins: *frozen* and *ambient*. To speed up drop-off, no two customers have their goods mixed into the same bin.
  - We can identify some classes here

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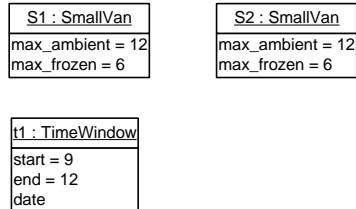
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- Add the relationships from the previous slide as associations.
- Add more classes as you discover them from the later parts

## Requirements Part 2

- All customers are near to one another, and near to the warehouse. When given a list of customers to deliver to, the drivers can always arrange things so that the average drive between customers is 10 minutes, and the average time to drop off groceries is 10 minutes.
  - This is an assumption
- The company has a fleet of 6 cube vans: 2 each of small, medium and large vans. Small vans can accommodate up to 12 ambient and 6 frozen bins, medium vans up to 24 ambient and 12 frozen, and large vans up to 36 ambient and 18 frozen. The vans are designated S1,S2,M1,M2,L1,L2.
  - This describes instances (objects) , will be used for Object diagram
  - The given sizes of vans can be used to further describe class Van



This object diagram is created based on Part 1 and 2.  
What else can you add to it?

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## Requirements Part 3

- Groceries are picked from the warehouse and put into bins by employees called "pickers". The bins are shunted to the loading bay and loaded into the vans by "loaders".
- The loading bay is large, and can simultaneously accommodate many more vans than we currently have. On average, vans can be loaded at the rate of 3 bins per minute. Since pickers and loaders don't cost very much, this number can be considered independent of the number of vans that need to be loaded at once.
- Bins are designated by an *identifier* hand-written on a peel-off sticker affixed to the bin. Bins are **reused**, however each time a bin is recycled, it is given a new designator. The designators have the letter "A" or "F" (for ambient or frozen), followed by a numerical id that starts at 1 for the first bin of its category that day, and goes up from there (e.g., "A12" or "F34").
  - Add the new classes to our first class diagram

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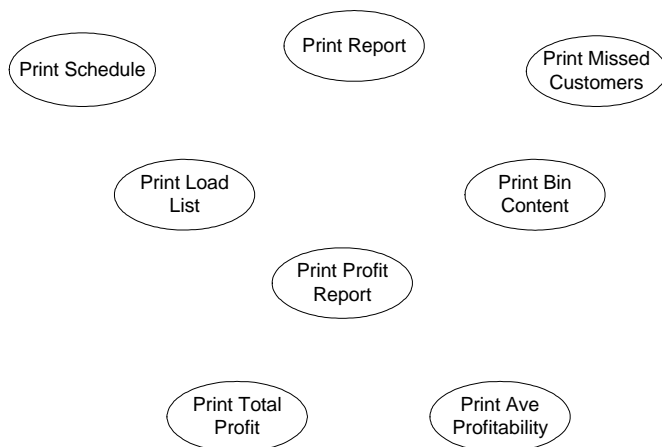
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## Requirements Part 4

- Given a list of customers, their orders, and their time windows, print out the following reports:
  - a schedule for when the individual vans should arrive and leave the loading bay;
  - for each arrival of each van, the list of bins they should load ordered by customer name;
  - for each bin throughout the day, a list of its contents;
  - total profit and average profitability per cubic foot of van space for that day, broken out by van size;
  - a list of customers that cannot be accommodated that day.
- Your program will have access to a database of grocery items that specify their *volumetric* displacement in cubic inches, the *cost* of each item to the customer, and the *cost* we pay to our suppliers.

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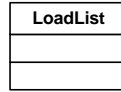
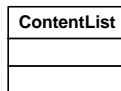
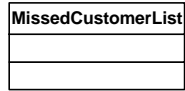
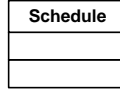
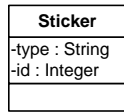
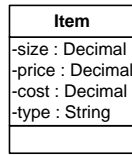
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- Are these the right use cases? Why?
- How do they relate?
- Can we identify new classes from them?

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- Do you have these classes in your diagram?
- What purposes do they serve?
- How would you divide the complete class diagram into presentable parts?