

Practice with List of Structures: The CD Store

We want to develop an inventory database for an online CD store. For each CD, the database stores its title, artist, price, how many copies are in stock, and its category of music (such as rock, blues, or country).

1. Develop a data definition for CD inventories.
2. Provide an example of CD inventories.
3. Write the template over CD inventories.
4. Write a function `copies-in-stock` that consumes a CD title, artist name and an inventory and produces the number of copies of the item with the given title and artist that are in stock. Return 0 if the named CD isn't in the inventory.
5. Write a function `restock` that consumes a CD title, number of new copies of that CD and an inventory and produces an inventory in which the named CD has the given number of additional copies (and all other CDs remain the same). Assume the CD is in the inventory.
6. Write a function `titles-by` that consumes an artist name and inventory and produces a list of titles of CDs by that artist.
7. Write a function `blues-sale` that consumes an inventory and produces an inventory in which all blues CDs are discounted by 10%.
8. Write a function `category-stock` that consumes a category name and an inventory and produces a list of all CDs in the named category that have more than 0 copies in stock.
9. (CHALLENGE) Write a function `unique-categories` that consumes an inventory and produces a list of music categories in the inventory. The produced list should not contain duplicates.
10. (CHALLENGE) Assume we had written `restock` above to not take the number of new copies as input, but instead always restocked inventory by 20 copies (a function called `restock-20`). Can you write one helper function that does the common work of `restock-20` and `blues-sale`? Write that helper, and show how to rewrite the original functions using it. What would you need to be able to do to use that function to write `restock`? (Once you can explain the problem, we'll show you how to work around it).