Bin Packing Algorithm Assignment

Design and write an algorithm in Python for solving the Bin Packing Problem. Develop your algorithm within the provided Python program by doing the following:

- Retrieve the assignment materials from Github repository:
  - BinpackingDev.py
  - binpacking.sql (MySQL dump file)
  - Github URL: https://github.com/jrb28/BUAD5042Binpacking
- Implement your algorithm in the Python program named `BinpackingDev.py` in the function named `binpack()`
  - Be sure to change the MySQL connection parameters at the top of `BinpackingDev.py` as is appropriate for your MySQL instance in order to connect to the database
- Use `BinpackingDev.py` to test your algorithm for the problems in the accompanying MySQL database.
  - The database is called `binpacking` and there is a link to download a dump file of the database on the Github site mentioned above.
- Once you have completed developing your algorithm, then cut and paste the `binpack()` function and save it in a file entitled `binpacking.py`
- Submit your assignment by placing the file `binpacking.py` in the folder in the location below. Replace [`username`] with your username.
  - `\\jonesfiles.campus.wm.edu\acstore-classes\BUAD5042\student\[username]`
- Details on the `binpack()` function
  - Input arguments:
    - `items`: a dictionary where
      - the key is the item `id` value (integer)
      - the value is the volume of the item, for example: {0: 2, 1: 5…}
      - the code provided in `BinpackingDev.py` already extracts this information from the MySQL database providing you revise the connection properties appropriately.
    - `bin_cap`: This value represents the volume capacity of each (identical) bin. Its value is already set in the `binpacking.py` program. You need not make any changes in this regard.
  - Output parameters: your function must output two values, in this order:
    - Name or username (string)
    - A list of lists, where each sub-list indicates the dictionary keys for the items assigned to each bin. For example, this list of lists,

      [[2,6,8,15],[1,11,7,9],…]

      indicates that the 0th bin contains items with these ids, [2,6,8,15], and the 1st bin contains items with these ids: [1,11,7,9]

    - Take care to (1) not overload the bins, (2) include all items in one bin, and (3) not assign items to more than one bin.