Question 10 - The application

Create the application shown below in the example test case.
Do this by placing all the functions (that you have created so far in this lab) below inline (one after another with appropriate spacing between the functions) into a single file and then add the code for handling the menu.

- display_as_list
- get_option
- get_item
- get_total_items
- add_item
- remove_item
- sort_list
- empty_list
- count_instances

Don't change any of the code inside the functions.

The code in the menu section needs to call the appropriate function that is selected by the user.

There is only one call to the print function needed for the code you will write for this question. There are no calls to the input function. Make use of the functions you have created.

Ignore any invalid options (an option that is not present in the list of options). Notice how z and Z are handled in the example.

You will need two lists, one for the menu, the strings for which are shown in the answer box and the other for the shopping items.

Paste all the code (9 functions plus the menu code) into the answer box.

Hints.

- Ignoring blank lines and comments, the solution to add the menu is about 38 lines of code.
- Create a list for the shopping items.
- The code only needs a while loop. Ensure you get the correct condition in the while loop as that will simplify your code.
- Only test for the options shown and only test for the specific character of the option.
- Notice how z and Z are handled.
- Not all the tests used are shown. This hidden case uses different non present options.

For example:

Test	Input	Result
# Test case 1	a one a two A three a D l S L a one Y d l r 0 r 3 y l e n l e y l d add z Z	 Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: a Please enter the item to be added: one [One] has been added to the list. There is 1 item in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: a Please enter the item to be added: two [Two] has been added to the list. There are 2 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list.

Test	Input	Result
	q	L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: A Please enter the item to be added: three [Three] has been added to the list. There are 3 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: a Please enter the item to be added: No item was entered. There are 3 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: D

Test	Input	Result
		There are 3 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: l Item 1: One Item 2: Two Item 3: Three Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: S The list has been sorted. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items.

Test	Input	Result
		S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: L Item 1: One Item 2: Three Item 3: Two Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: a Please enter the item to be added: one [One] is already in the list, please confirm that you want to add another (y/n): Y [One] has been added to the list. There are 4 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit.

Test	Input	Result
		Option: d There are 4 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: l Item 1: One Item 2: Three Item 3: Two Item 4: One Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: r Please enter the item number of the item to remove or 0 to cancel: 0 Remove request cancelled. Shopping list options. A) Add an item.

Test	Input	Result
		R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: r Please enter the item number of the item to remove or 0 to cancel: 3 Are you sure (y/n)? y Item 3 [Two] has been removed from the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: l Item 1: One Item 2: Three Item 3: One Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list.

Test	Input	Result
		C) Count the instances of an item in the list. Q) Quit. Option: e Please confirm that you want to empty the list (y/n): n The list has not been emptied. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: l Item 1: One Item 2: Three Item 3: One Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: e Please confirm that you want to empty the list (y/n): y All the items have been removed from the list.

Test	Input	Result
		Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: l Sorry, the list is empty. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: d There are 0 items in the list. Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: add

Test	Input	Result
		Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: z Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: Z Shopping list options. A) Add an item. R) Remove an item by its item number. D) Display the total number of items in the list. L) List all the items. S) Sort the list. E) Empty the list. C) Count the instances of an item in the list. Q) Quit. Option: q Shopping time.

Data required in the code:

```
# 'Shopping list options.'
# 'A) Add an item.'
# 'R) Remove an item by its item number.'
# 'D) Display the total number of items in the list.'
# 'L) List all the items.'
# 'S) Sort the list.'
# 'E) Empty the list.'
# 'C) Count the instances of an item in the list.'
# 'Q) Quit.'

# 'Shopping time.'
```