

COMP500 / ENSE501: Week 11 – Exercise:

EXERCISE NAME: *BSearch Structures*

The following program source code is incomplete:

```
1  #define _CRT_SECURE_NO_WARNINGS
2  #include <stdio.h>
3  #include <stdlib.h>
4  #include <string.h>
5
6  typedef struct tag_Contact
7  {
8      char name[32];
9      char phone[20];
10 } Contact;
11
12 int compare_names(const void* a, const void* b);
13 Contact* find_contact(Contact* database, int db_size, const char* name);
14
15 int main(void)
16 {
17     // TODO: 1) Declare an array of Contact structures:
18
19     // TODO: 2) Populate individual Contact structures:
20
21     // TODO: 3) QSort the array of structures by name:
22
23     do
24     {
25         char input[32];
26         printf("> ");
27         scanf(" %31[^\n]", input);
28
29         Contact* search_result = 0;
30
31         // TODO: 6) Call find_contact, saving into search_result:
32
33         if (search_result)
34         {
35             printf("%s - %s\n", search_result->name, search_result->phone);
36         }
37         else
38         {
39             printf("Not found!\n");
40         }
41     }
42     while (strcmp(input, "quit") != 0);
43
44     return 0;
45 }
46
47 // TODO: 4) Define compare_names:
48
49 // TODO: 5) Define find_contact:
```

At // **TODO: 1)** declare an array of **Contact** structures.

At // **TODO: 2)** populate individual contact structures with name and phone number details.

At // **TODO: 3)** use **QSort** on the **Contact** array of structures to sort them by **name**.

At // **TODO: 4)** define the **compare_names** function. This function must support alphabetical sorting of the **name** member inside a **Contact** structure. This function must have no side effects.

At // **TODO: 5)** define the **find_contact** function. This function must use the **bsearch** function to find a **Contact** in the **database** based upon the **name** parameter. This function must have no side effects.

At // **TODO: 6)** call **find_contact** passing in the appropriate augments and saving the result returned into the **search_result** pointer.

Ensure the program output is exactly as described, and that the whitespace of your source code is well formatted.