

This project is a group project. You must work in a group. Your group should have two members (one group will be allowed to have three if necessary). For this project your group will be designing an opaque object that allows your users to interact with a data structure representing a set.

According to Wikipedia: A set is an abstract data structure that can store certain values, without any particular order, and no repeated values. It is a computer implementation of the mathematical concept of a finite set.

Your opaque object should have a handle type called MY_SET and should be able to store sets of integer values. You must support the following interface exactly:

```
enum boolean {FALSE, TRUE};
typedef enum boolean Boolean;

MY_SET my_set_init_default();

Boolean my_set_is_element(MY_SET hMY_SET, int item); //returns TRUE if item is in the set; exit on error
Boolean my_set_is_empty(MY_SET hMY_SET); //returns TRUE if the set is empty; exit on error
int my_set_size(MY_SET hMY_SET); //returns the number of elements in the set; -1 on error

Status my_set_traverse(MY_SET hMY_SET, void (*visit)(int));
// call visit on each node in the set. (Use an inorder traversal of your AVL tree)

my_set_add(MY_SET hMY_SET, int item); //adds item to the set if it is not already in it.

Status my_set_remove(MY_SET hMY_SET, int item);
//find and remove item from the set if it is present otherwise ignore.

void my_set_destroy(MY_SET* p_hMY_SET);
//destroy the data structure and set the handle pointed to by the argument to NULL.
```

We will also add one other function that I can use for testing that is not part of a set interface but will help me determine if you have a working example of your AVL tree.

```
int my_set_height(MY_SET hMY_SET); //return the height of the AVL tree used for implementation. An empty
tree has height 0, a tree with one node has height 1.
```

Your implementation of the set data structure should use an AVL tree. Use your book to create this data structure and turn in your my_set.h file and my_set.c file. Although you will want to have a main program to test your work you do not have to turn it in as I will be using my own.