Abstract Data Type, ADT

In this assignment you will work with Abstract Data Type, ADT.

1. ADT

Download the file `adt.c` from the home page of the course or from `/info/DD2325/appcs11/`. In the file you will find a programme which manipulates an abstract data type. Compile the file and run it. Try to understand the code and how the programme works.

- Which ADT is this?
- In the code you will find several places where one checks if the `adt` is empty or not. Write a function `IsEmpty` and use it to check if the `adt` is empty or not. Update the code with your function.
- Why is it better to use a function like `IsEmpty`?
- Can you think of any reason(-s) at all to have a function `IsFull`?
- Implement the function `IsFull`.
- Why is call-by-reference used in the functions `RemoveItem` and `Print`? Can one do with call-by-value instead? Update the code if so.

2. Unique entries

In the given programme it is possible to add identical entries over and over again. For example I can add the number `12` several times.

Your task is to write the code so this is NOT possible. The programme should have a polite and informative error message if one tries to add an already existing number in the `adt`.

3. Max size of the `adt`

Implement a restriction on the number of elements in the `adt`. This is called the size of the `adt`.

- Set the maximum size of the `adt` to 100. The max size should be easy to change if necessary. Make the necessary changes in the code.
- Go through the code and see if you can make the code easier to read, easier to test and avoiding errors. Make the necessary changes.

You are NOT allowed to change the data structure completely but you should be able to discuss an alternative data structure.

4. Exit the program

Why is it important to have a function like `Clear`?