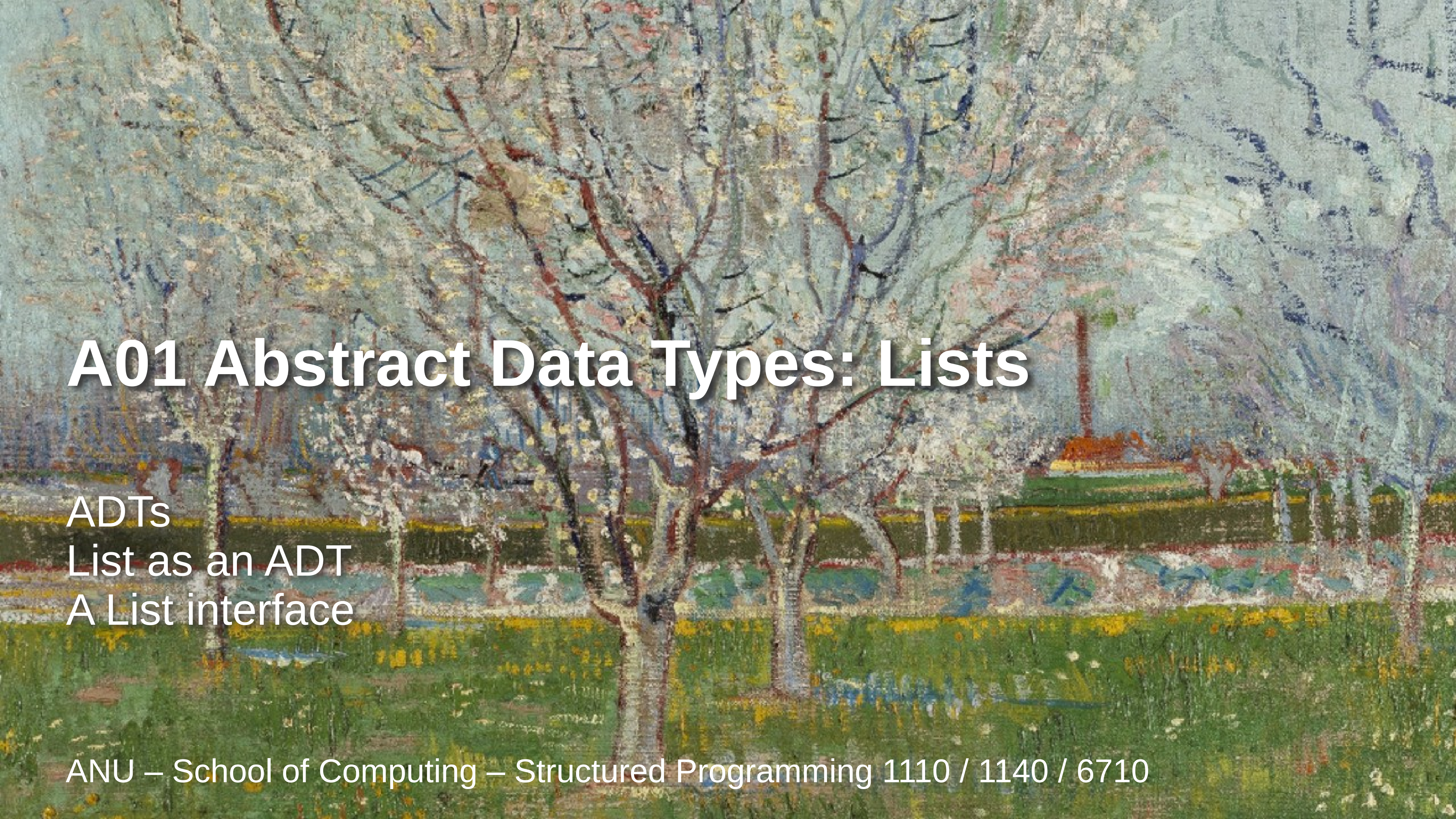

A01 Abstract Data Types: Lists

ADTs
List as an ADT
A List interface

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Abstract Data Types (ADTs)

Abstract data types* describe the behaviour (semantics) of a data type without specifying its implementation. An ADT is thus **abstract**, not concrete.

- A **container** is a very general ADT, a holder of objects.
- A **list** is an example of a more specific container ADT.

* Not to be confused with: *Algebraic* Data Type.

The List ADT

The **list** ADT is a container known mathematically as a finite sequence of elements. A list has these fundamental properties:

- duplicates are allowed
- order is preserved

A list may* support operations such as these:

- *create*: construct an empty list
- *add*: add an element to the list
- *is empty*: test whether the list is empty

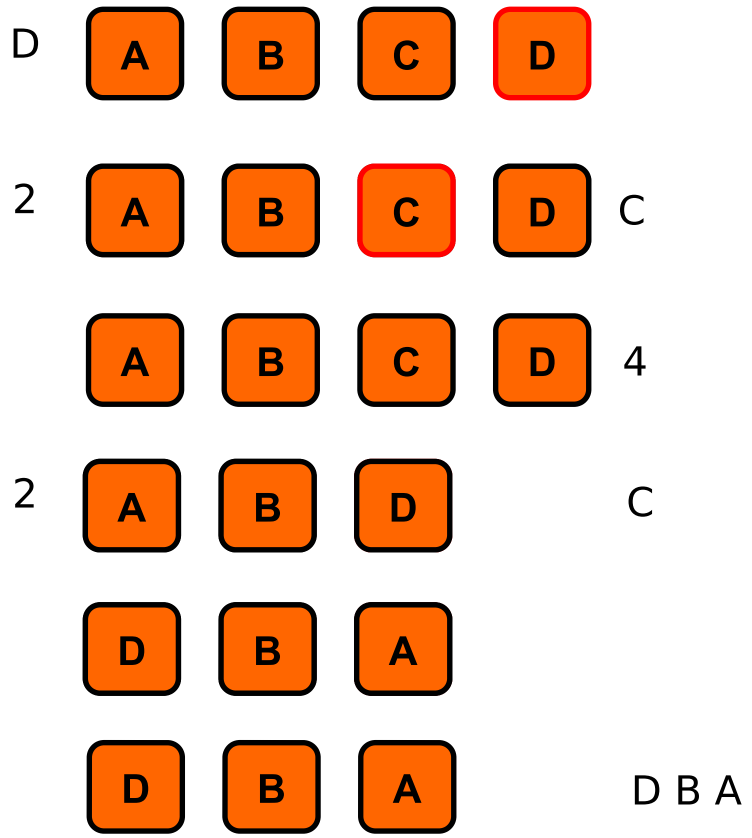
* The operations a given ADT must support will vary depending on the author / library

Our List Interface

We will explore lists using a simple interface:

```
public interface List<T> {
    void add(T value);
    T get(int index);
    int size();
    T remove(int index);
    void reverse();
}
```

```
void add(T value);

T get(int index);

int size();

T remove(int index);

void reverse();

String toString();
```



D A B C D
2 A B C D C
A B C D 4
2 A B D C
D B A
D B A D B A