

Concepts of Programming Languages, CSCI 305, Fall 2021 Functional Languages, Chapter 11, Aug. 25

First functional language was Lisp, which stands for List processing. It was developed by John McCarthy in 1958.

Comparison of functional programming versus OO: <https://www.educba.com/functional-programming-vs-oop>

Use:

- Functional programming is used only where there are few things, with more operations.
- OOP is used when there are many things with few operations.

Iteration:

- In functional programming recursion is used for iterative data.
- In OOP loops are used.

Execution:

- In functional programming statements can be executed in any order.
- In OOP statements need to be executed in a particular order.

Model:

- Functional programming follows the declarative programming model.
- OOP follows the imperative programming model.

Model - continued:

- Functional programming uses immutable data.
- OOP uses mutable data.

Definition:

- Functional programming emphasis is on evaluation of functions.
- OOP is based on the concept of objects.

Advantages of Functional Languages

- They are “referential transparency” – an expression always evaluates to the same result in any context (so the equivalence of two expressions at any point in time implies their equivalence at all times)
- They have no internal state
- They have no side effects
- Proving assertions about a functional program is easier
- Some claim that, once learned, these programs are easier to write, debug and maintain
- Highly appealing for parallel execution since arguments can be evaluated in parallel