

Modularisation

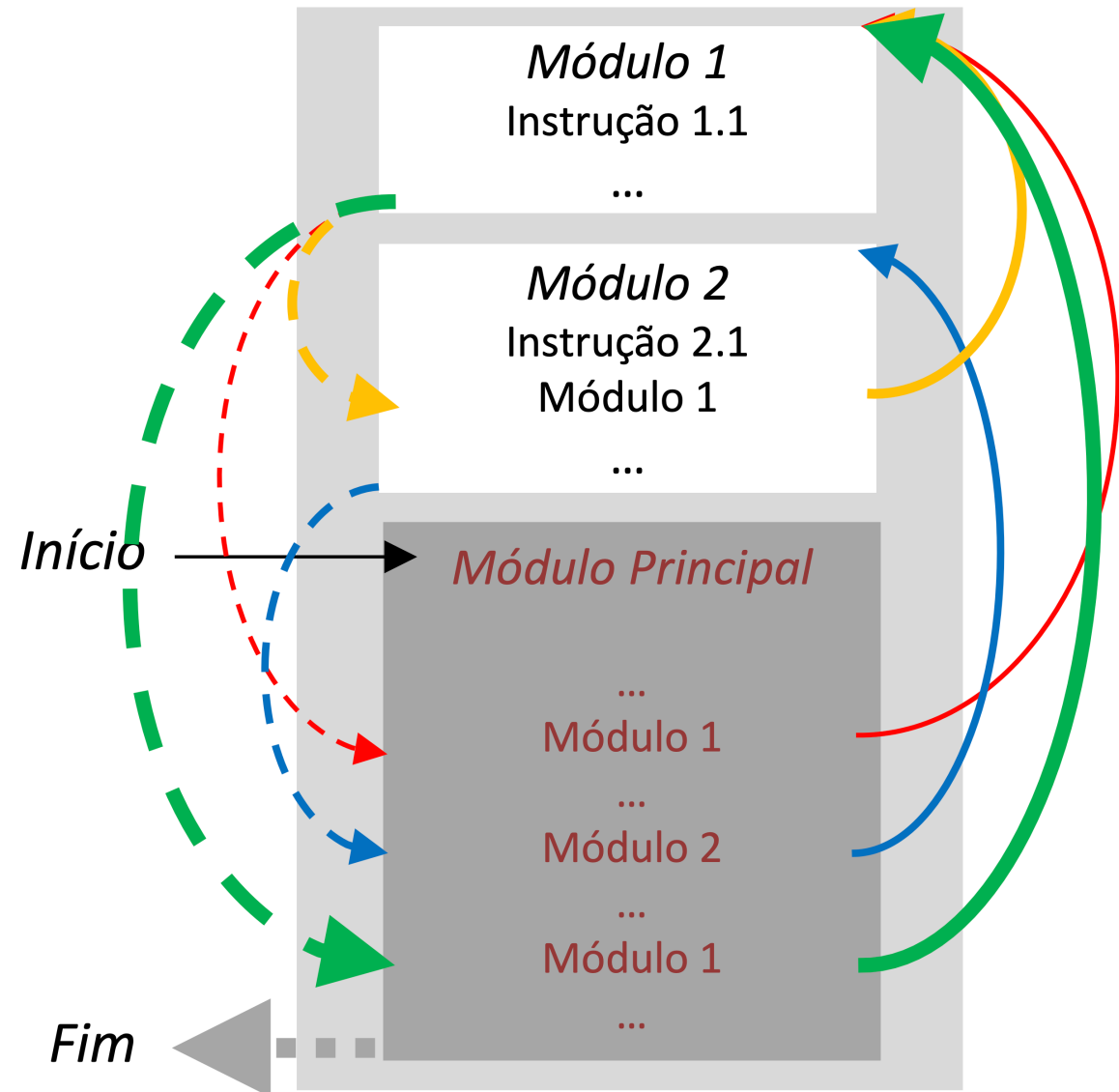
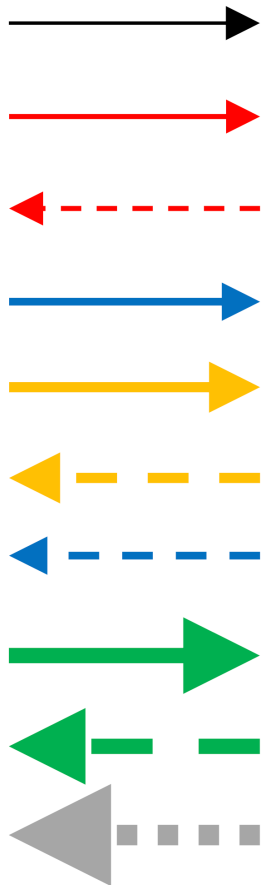
ISEP / SWitCH_QA / DESOFT I

Modularisation

- A program can be composed of a Main Module and other modules
- Main Module
 - It is always the first module to be executed
 - Controls a program's execution
- When calling a module, control temporarily passes to the called module
- After the execution of a module, control returns to the module that called it and to the instruction following the one that originated the call

Control Flow

Sequência de execução:



Advantages

- Decomposition
 - Smaller subprograms
 - Reduce development complexity
 - Make development faster
 - Independent modules can be developed in parallel
- Reutilisation
 - Reuse of modules
 - Make development faster (avoid redundancy)
 - Make the program smaller and simpler to read/understand
- Abstraction
 - Abstraction of task implementation
 - Facilitate development
 - A module's developer abstracts itself from implementation details of other modules
 - E.g, `squareRoot(x)`

Example: demo-one.ts

Exemplo: Calcular combinações $C_{(n,r)} = \frac{n!}{r! (n-r)!}$

INICIO

ED: n, r, resultado, fn, fr, fnr, i INTEIRO

LER (n, r)

//n!

resultado ← 1

REPETIR PARA i ← 2 ATE n PASSO 1

resultado ← resultado * i

FIMREPETIR

fn ← resultado

//r!

resultado ← 1

REPETIR PARA i ← 2 ATE r PASSO 1

resultado ← resultado * i

FIMREPETIR

fr ← resultado

//(n-r)!

resultado ← 1

REPETIR PARA i ← 2 ATE (n-r) PASSO 1

resultado ← resultado * i

FIMREPETIR

fnr ← resultado

ESCREVER (fn / (fr * fnr))

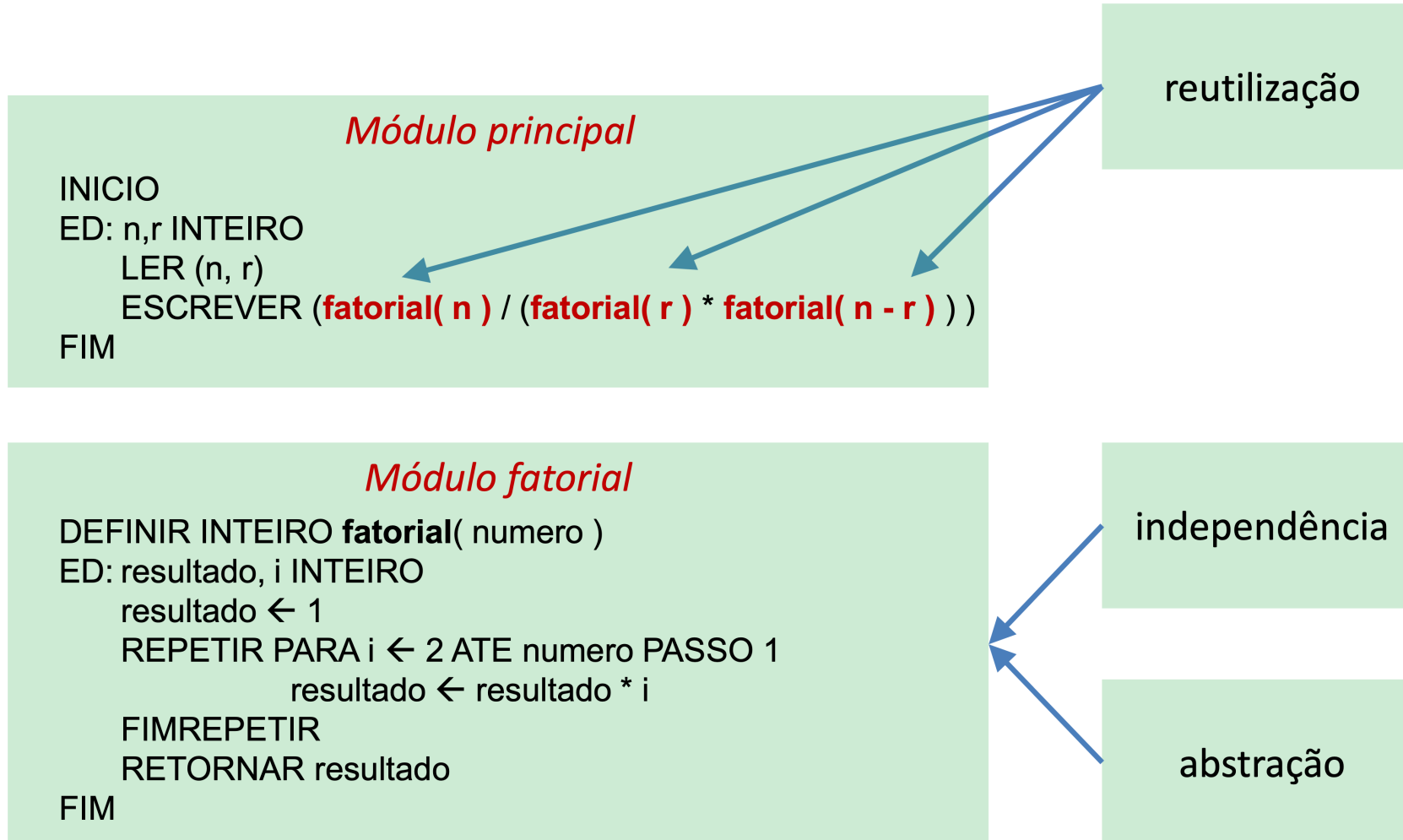
FIM

redundância



Example: demo-two.ts

Exemplo: Calcular combinações $C_{(n,r)} = \frac{n!}{r! (n-r)!}$



Summary

- So far,
- We've understood how to modularise your software, splitting it in smaller sized functions.
- You should try and apply this to your exercises.
 - Use your existing tests as regression testing.

Bibliography

- Adapted from LEI/APROG's, LEI/ESOFT's & SWITCH/DESOFT's slide decks
- “Programação, algoritmos e estruturas de dados”; João Pedro Neto; Escolar Editora