COS**341** **Project 3** (2017): *Executable Code* for *SPL*

(Part 3*a*)

bye

NEW Project Partner !
will be allocated to you
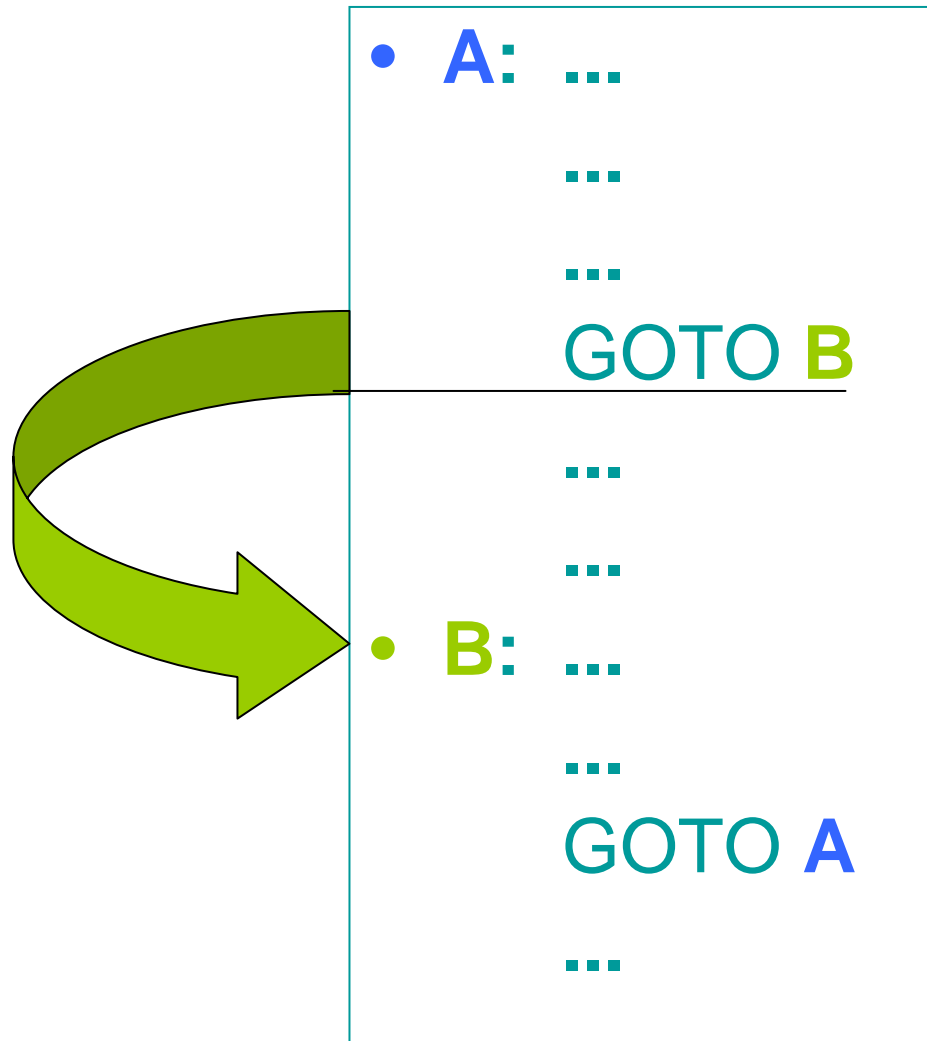*during the lecture (soon)*

Project 3: Overview

- Part 3***a***: Intermediate Code **Preparation**
  (**now**)

- Part 3*b*: Intermediate Code Generation
  (later)

- Part 3*c*: Intermediate Code Optimisation
  (later)

von-Neumann Code

- A **von-Neumann language** is simple kind of computer language which offers **symbolic addresses** together with **GOTO commands** to those symbolic addresses.

- This kind of language can be "understood" by all computers which have the **von-Neumann/Zuse hardware architecture**

(Footnote: *J.v.Neumann* and *K.Zuse* both invented this hardware architecture independently from each other.)

- Due to **Dijkstra**'s famous letter, "*GOTO Statement considered harmful*", our **modern programming languages** (e.g.: JAVA) are *NO von-Neumann languages* any more.

- But, as we are **still using** the **von-Neumann/Zuse hardware architecture**, our compiler must be able to **translate** modern code **into von-Neumann** code!

von-Neumann Code (**sketch**)

- **A:** ...

  ...

  ...

  GOTO **B**

  ...

  ...

- **B:** ...

  ...

  GOTO **A**

  ...

BASIC

- The old programming language **BASIC** (**B**eginner's **A**ll-purpose **S**ymbolic **I**nstruction **C**ode) *is a von-Neumann language* (with symbolic **address labels** and **GOTO**).

- BASIC is an **interpreted** language (see textbook chapter #4: interpreters) with which the (novice) programmer can **see immediately** (on the screen) "**what is going on**":

  - *Therefore it is still of* **high "educational value" for students**, *though hardly anybody uses BASIC in software development practice any longer.*

- For this reason we **use BASIC as the target language** into which we will translate programs from our Students' Programming Language (*SPL*).

  - *If we have programmed our SPL compiler well, then we should be able to* **see** ☺☺ **how** *an SPL program* "**is actually running**" *in the BASIC environment*: This has high Educational Value ☺

Your TASKS for Sub-Project **3a**

- **Self-study**, with your new project partner, the ancient programming language **BASIC** in its original **von-Neumann** form (*without* all the later modern *extensions*)
  - *It is extremely simple* ☺☺

- Download (from anywhere on the Internet) a suitable **BASIC interpreter**, and **install** it on your computer.

- **Read the famous letter** by E.**Dijkstra**: "*GOTO Statement considered Harmful*"