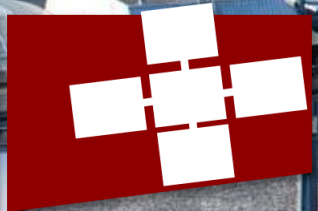


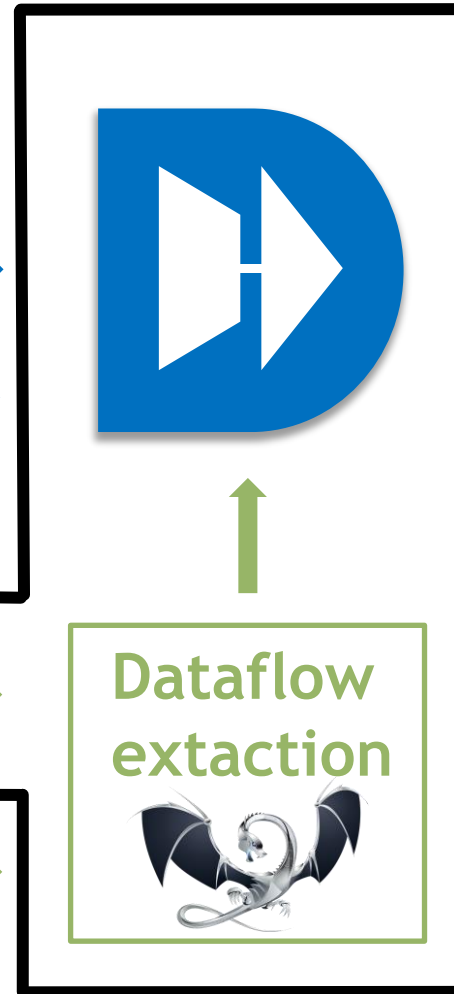
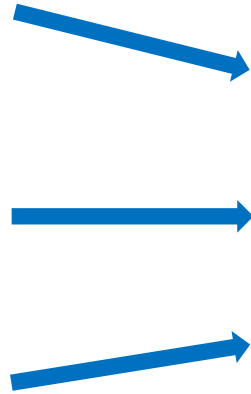
ALEXANDRU CALOTOIU

## DaFlEx: C2Dace – First steps





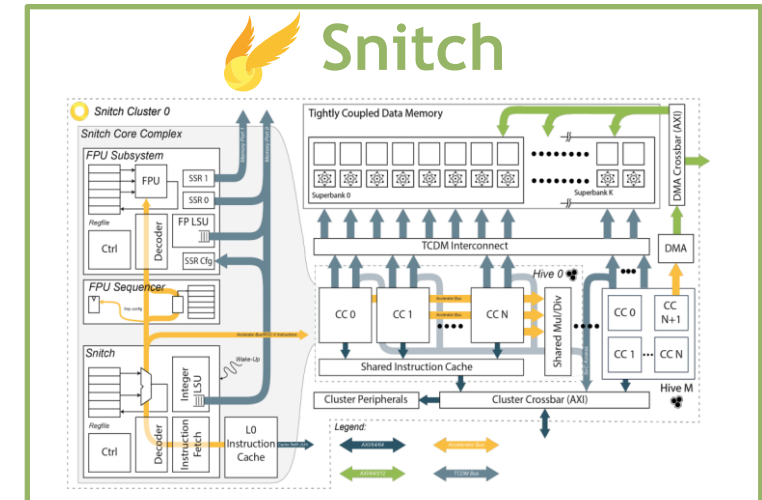
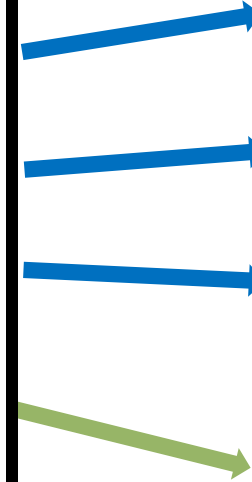
# DaFlEx – first goals



C2DaCe  



Fortran

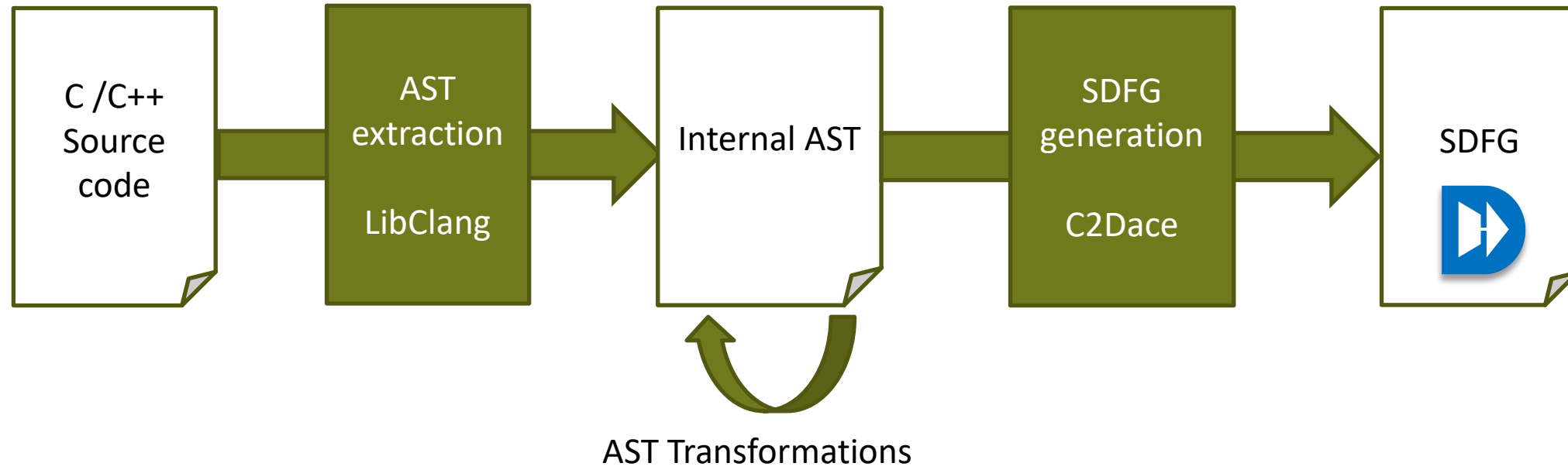


# C2DACE

C Language	SDFG Equivalent
Declarations and Types	
Primitive data type	Scalar data container
Type qualifier (const,volatile)	Implicit, hints provided are inherent to the SDFG representation
Storage class (static,auto,register, etc.)	Data container properties (e.g., life-time, storage location)
Pointer	Access node
Array	Array data container
Structure	Data container type struct
Union	Data container references
C Language	SDFG Equivalent
Expressions and Assignments	
Operators (e.g., Unary,Binary)	Tasklet with incoming and outgoing memlets for read/written operands
Compound assignments	Tasklet
Array expression	Memlet

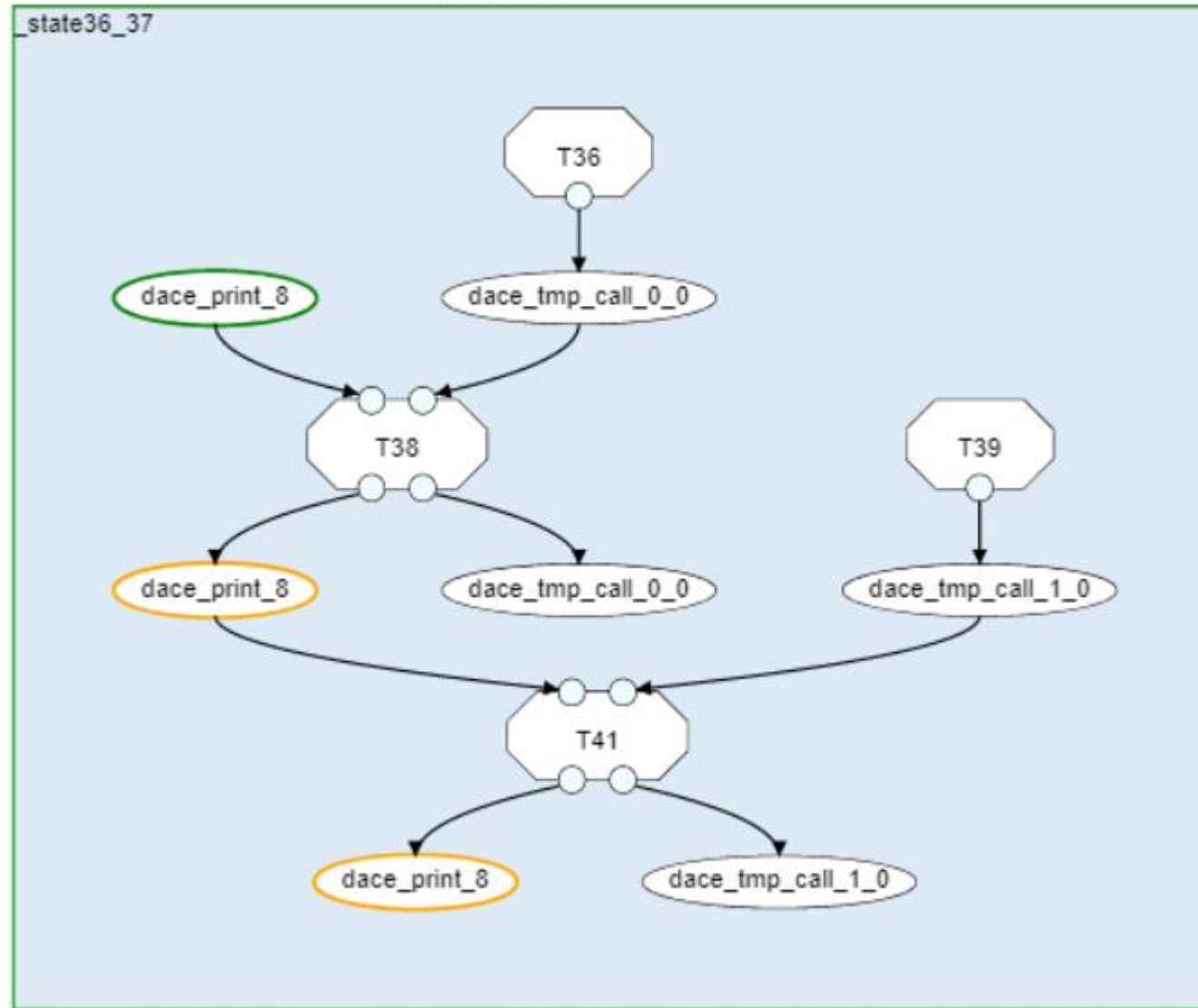
C Language	SDFG Equivalent
Statements	
Compound (blocks)	Nested SDFG
Branching (if,switch)	Branch conditions on state transition edges
Iteration (for, while,do..while)	Nested SDFG for compound state-ment, with states and state transi-tions for loop logic
Function flow (break,continue, return)	Edge to SDFG exit state, using helper variable to find context
goto	State transition if within same SDFG,otherwise unsupported
C Language	SDFG Equivalent
Functions	
Function calls (with source)	Nested SDFG for content, memlets reduce shape of inputs and outputs
External/Library calls	Tasklet with library state
Recursion	Unsupported
Function pointers	No equivalent, unsupported
C Language	SDFG Equivalent
Parallelism	
-	Parametric Map scope

# Dataflow extraction pipeline for C/C++

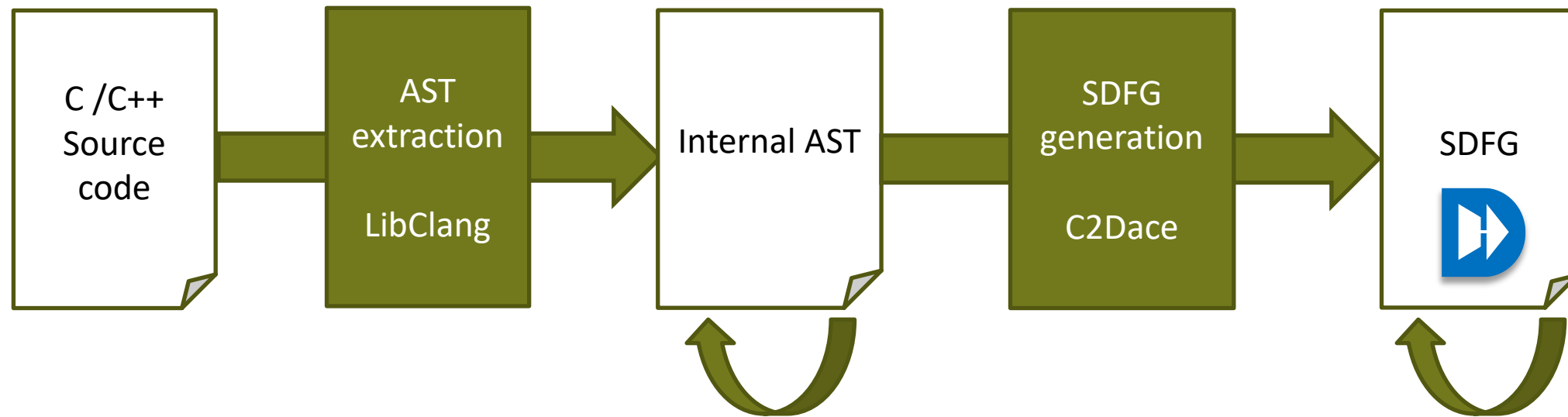


- Typedef elimination
- Array index extraction
- Function call isolation
- Separating variable declaration and initialization

# Library states



# Dataflow extraction pipeline for C/C++



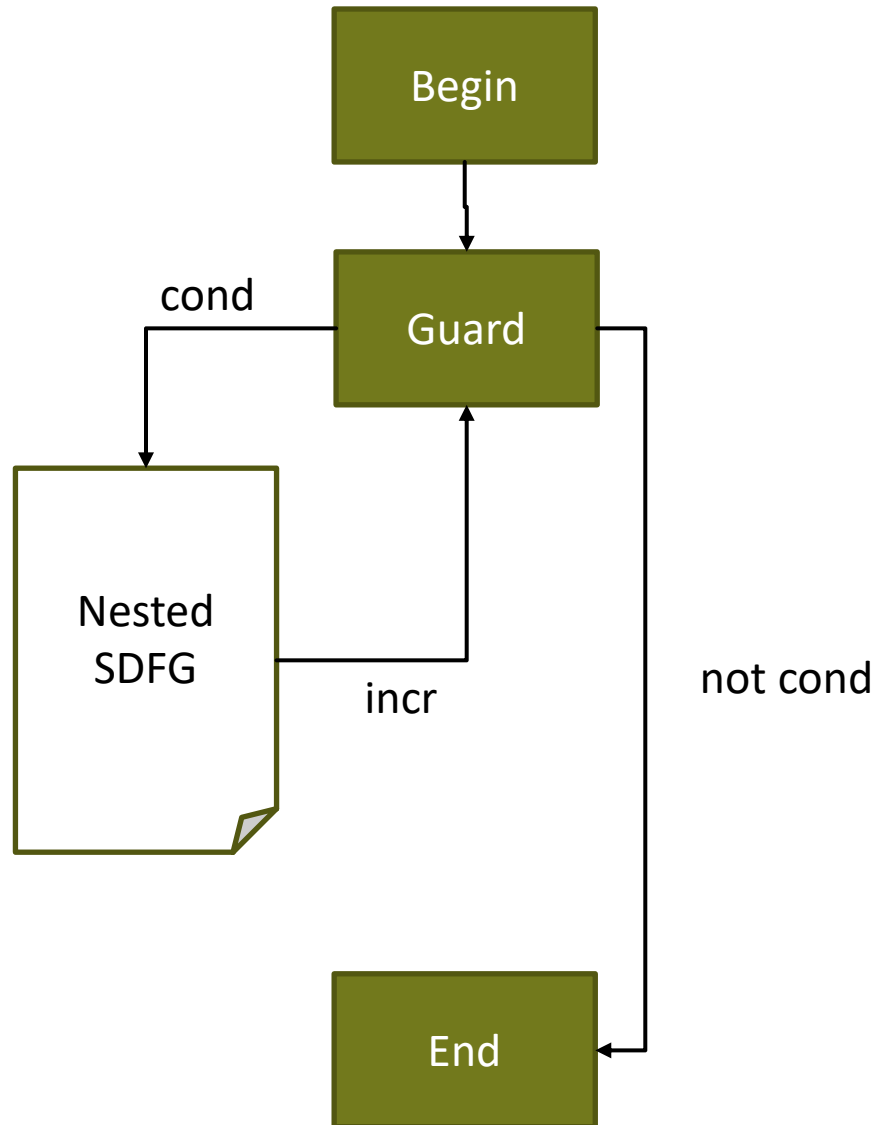
Candidates:

- Polybench
- LULESH
- C HPC codes?

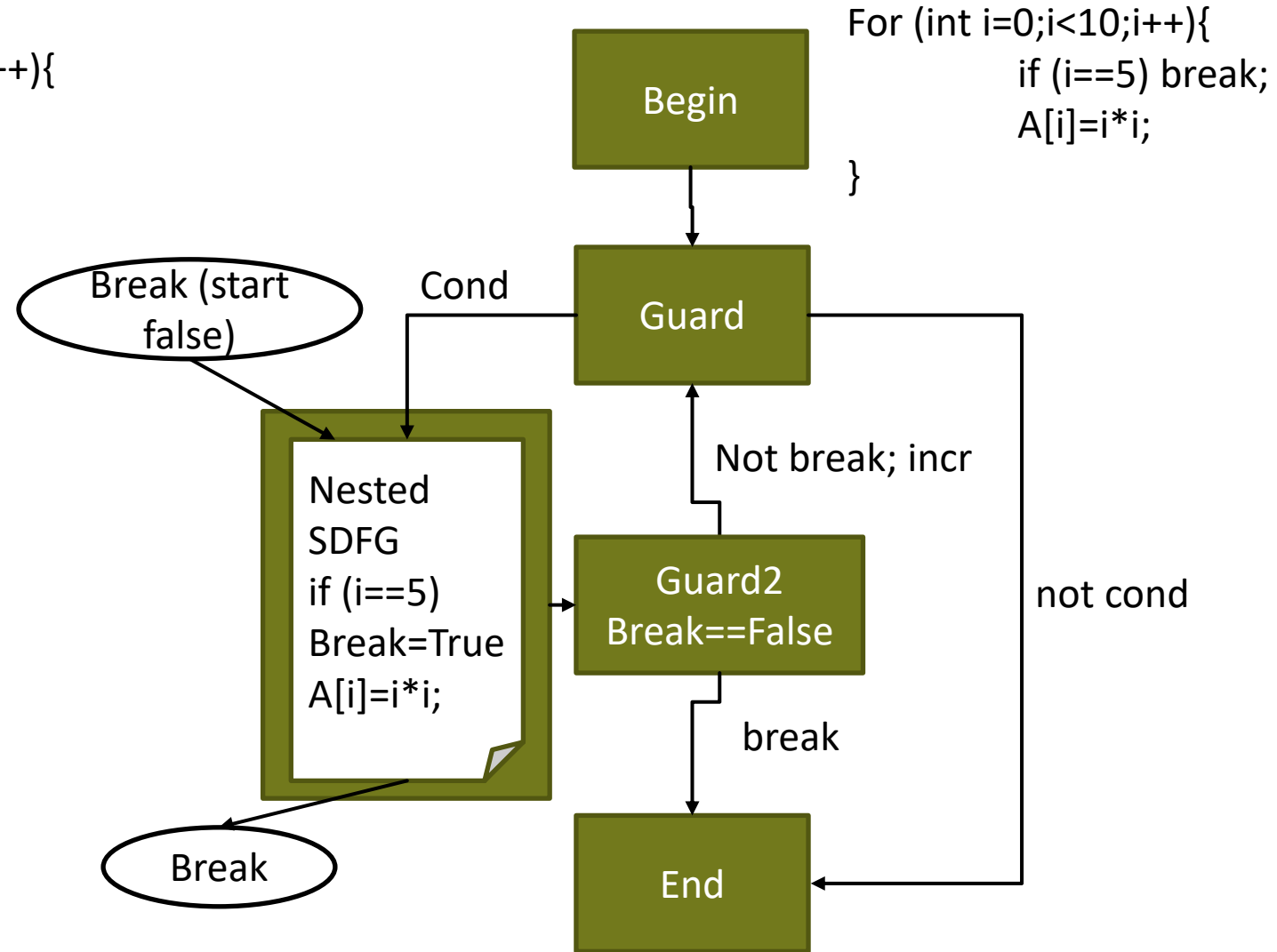
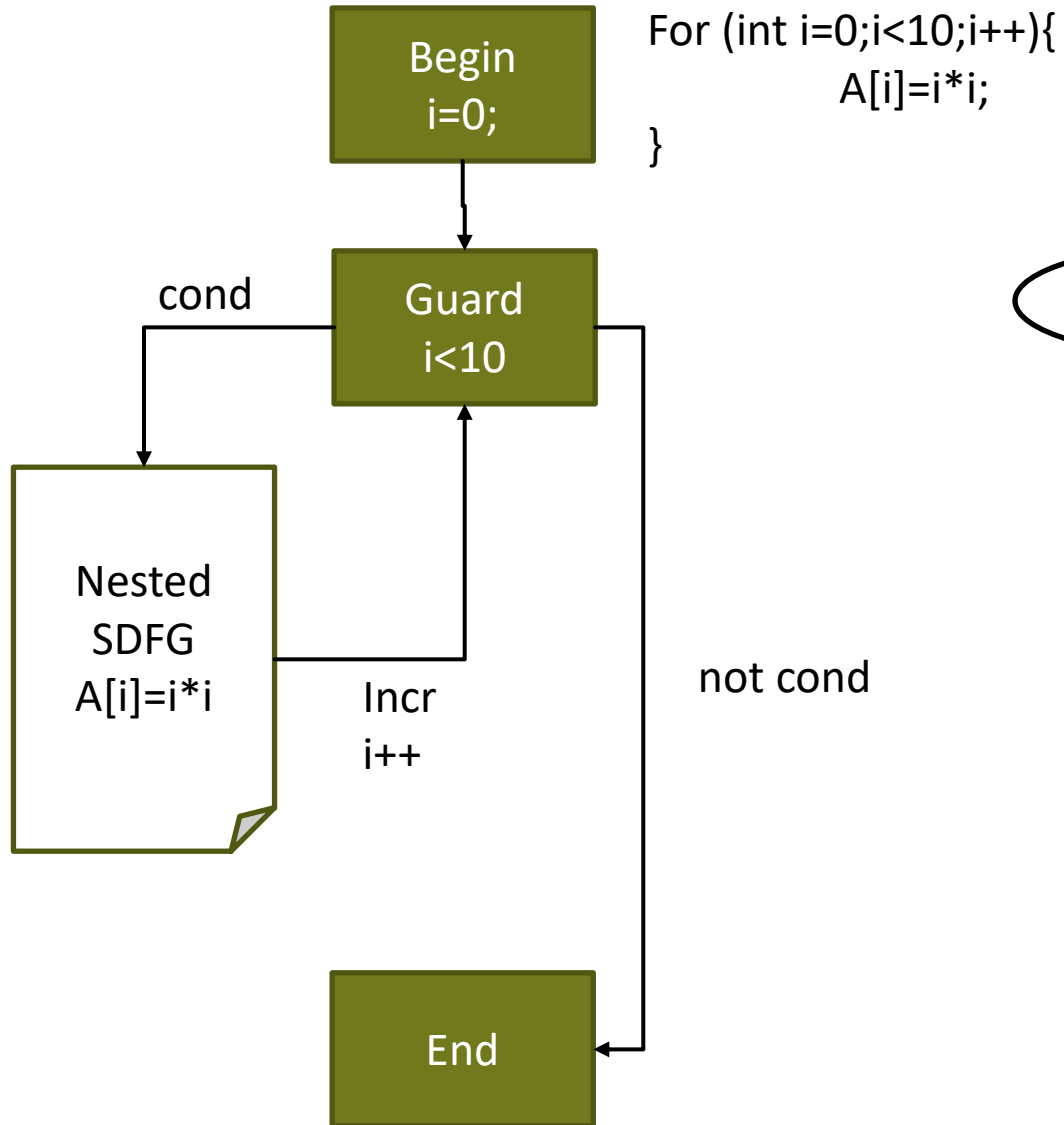
SDFG Transformations

- Symbol promotion
- Create WCR accesses where necessary
- **Loop to Map**

# Break/Return



# Break/Return





# Thank you!

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