Extensions to the Code Generator for Alpha

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Overview

- Introduction
  - What CodeGen does
  - Where does CodeGen fit in
- Previous Work
- Extensions Proposed

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Where Does Code Generator fit in :

What Code Generator does :

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Where Does Code Generator fit in :

What Code Generator does :

- Why is it needed :
  - ★ Checking correctness of program

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Previous Work

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  - ★ Code ⇒ Demand Drivens

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  - ★ Code ⇒ Demand Drivens
- CodeGen( ) in Mathematica by Fabien Quillere
  - ★ Code ⇒ Respecting Schedule
- Areas untouched by CodeGen( )
  - ★ writeC( ) functionality
  - ★ Reductions
  - ★ Subsystems

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Functionality of writeC in CodeGen

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- Motivations
  - ★ People used to
  - ★ Single Package
  - ★ Easier Maintainence and Extension

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Functionality of writeC in CodeGen

- Motivations
  - ★ People used to
  - ★ Single Package
  - ★ Easier Maintainence and Extension
- Handling
  - ★ CodeGen called Without Schedule or option noSched set
  - ★ different function called internally in same file

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Handling Reductions

- What is a reduction :
  - reduce(op , affine ,expr)
  - B[i, j] = A[i, j-1] - reduce(+, (i, j,k $\longrightarrow$ i, j), Y)

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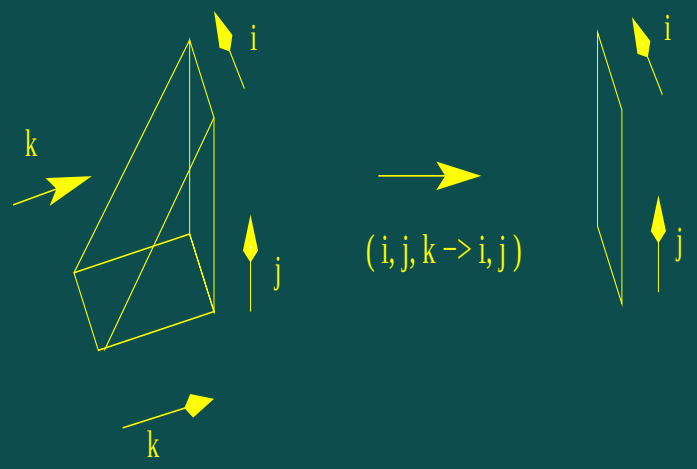

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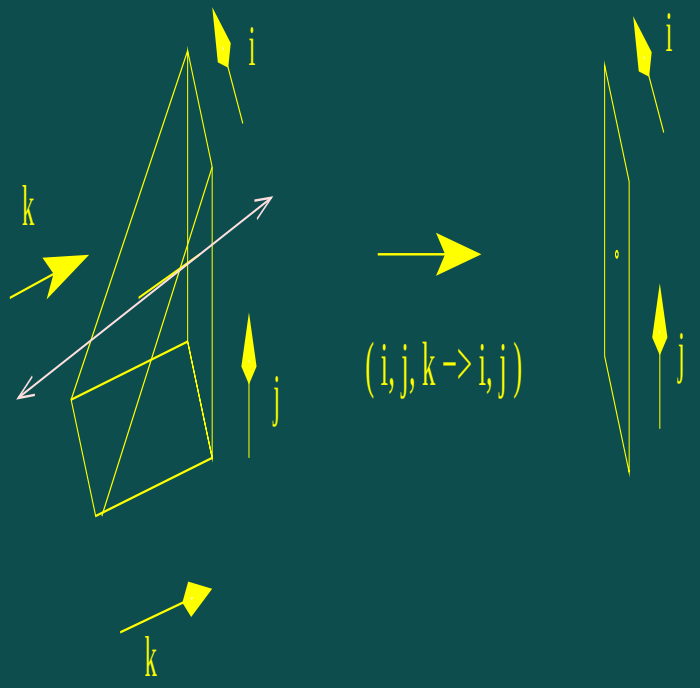
- How will it be handled:
  - We take preimage of point on expr domain by the affine function, intersect with the domain of expr and generate a loop for the resultant polyhedra



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Handling Subsystems

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- What are subsystems :
  - ★ $\{$domain$\}$ use sub-name[ ] (inputs) returns (outputs);
  - ★ $\{i , j \mid 1 \leq i \leq j \leq N\}$ use Lxb[ ] (L , B) returns(X);

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  - ★ Equivalent blocked and un-bloocked programs
  - ★ C programs which generate input,feed in different scanning orders and compare outputs

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- Usefulness to the Test Bench :

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Conclusion

- We Have seen how :
  - Single package will be made
  - writeC( ) functionality will be provided
  - Reductions and Subsystems will be handled