Lecture 8: Composite Function Blocks
Connecting Blocks Together

- Function Blocks can be connected via event and data connections thus forming FB networks
- The event connections and behaviour of every single block completely determine behaviour of the network
Such networks can be encapsulated into composite function blocks for future re-use
Composite Function Block

- Similarly to basic function blocks, composite blocks have interface with input and output event and data variables.
- Composite function blocks do not have internal variables.
Hierarchical Composition

- Elements of the network can be other composite blocks
- Thus, applications can be structured hierarchically
- Levels of hierarchy are unlimited
Example: Composite FB implementing eXclusive OR
Example: calculate $X^2 - Y^2$ using composite FB
“Forking” Event Connections

Incorrect

Solution
Merging Events

Incorrect

Solution
Data Connections

Incorrect

Allowed
ECC in Composite FBs?

- Composite blocks do not have ECCs.
- However, an additional component block within a composite FB can play this role as illustrated in the figure.
Conclusions

- The behaviour of a composite function block is determined by a network of function block instances. A composite function block is just a container for a network of other function blocks.
- The container as such performs no specific actions except for setting input and output variables and for the activities of its components. The network can include basic, service interface, and composite function block types.
- Thanks to that function block applications can be hierarchical.
- A composite function block does not have Execution Control Chart and internal variables.