

# COMBINATIONAL CIRCUITS USING STRUCTURAL MODELING

Vaidhyanathan - 201201010129  
 (40)  
 Ajaykumar - 201201010129  
 (40)  
 Kousthubh - 201201010129  
 (40)  
 (B-3) 34-87th

## COMBINATIONAL CIRCUITS ?

A combinational circuit is a circuit whose output depends only on the current state of the input in hardware terms. Each output is a function of the inputs.

- Characteristics of Combinational Circuits
  - No memory element
  - Circuit design is not complex
  - Time independent circuit
  - There is no feedback element
- Eg: Full adder, Multiplexer, Decoder

• Data Flow Modeling  
 $Y \leftarrow \text{Expression};$

• Behavioral Modeling  
 $Y \leftarrow (\text{conditional statement});$

The different types of modeling styles are:-

- Data flow Modeling
- Behavioral Modeling
- Structural Modeling

• Points to Register  
 • While doing the code with structural modeling, name of the component should be same as that of entity of the component  
 • Component should be declared in declarative part of architecture



# COMBINATIONAL CIRCUITS USING STRUCTURAL MODELING

## COMBINATIONAL CIRCUITS ?

A combinational circuit is a circuit whose output depends only on the current inputs. It has no memory. It is a logic circuit that produces a specific output for a given set of inputs. It is a logic circuit that produces a specific output for a given set of inputs. It is a logic circuit that produces a specific output for a given set of inputs.

## Value Functions - PROPERTIES

Value Functions - PROPERTIES  
 - Input range  
 - Output range  
 - Input range  
 - Output range  
 - Input range  
 - Output range

## Modeling

Modeling  
 - Input range  
 - Output range  
 - Input range  
 - Output range  
 - Input range  
 - Output range

## The different types of modeling

The different types of modeling  
 - Behavioral modeling  
 - Structural modeling  
 - Behavioral modeling  
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 - Behavioral modeling  
 - Structural modeling

## STRUCTURAL MODELING

STRUCTURAL MODELING  
 In structural modeling, the circuit is represented by a hierarchy of modules. Each module is a sub-circuit that is itself modeled using structural modeling. This allows for a hierarchical representation of the circuit, where each module is a sub-circuit that is itself modeled using structural modeling.

## SYNTHESIS & IMPLEMENTATION

SYNTHESIS & IMPLEMENTATION  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation

## EXAMPLE

EXAMPLE  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation

## STRUCTURAL MODELING

STRUCTURAL MODELING  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation

## APPLICATIONS

APPLICATIONS  
 - Digital circuit design  
 - Digital circuit design  
 - Digital circuit design  
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 - Digital circuit design

## DIFFERENCE BETWEEN

DIFFERENCE BETWEEN  
 - Behavioral modeling  
 - Behavioral modeling  
 - Behavioral modeling  
 - Behavioral modeling  
 - Behavioral modeling  
 - Behavioral modeling

## MODE

MODE  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation  
 - Component instantiation