DAY-64
#100DAYSRTL

"System Verilog: Argument Passing "

"Introduction":-

System Verilog enables versatile argument passing in functions and tasks. It supports passing by value, reference, and position, facilitating diverse data handling methods. Additionally, it allows default argument values, offering flexibility. These features empower efficient hardware description and verification methodologies within System Verilog designs.

"Argument pass by value":-

- The argument-passing mechanism works by copying each argument into the subroutine area.
- If any changes to arguments within the subroutine, those changes will not be visible outside the subroutine.

Code practicing:-

```
module tb;
  int x,y,z;
  function int sum(int x,y);
    x = x+y;
    return x+y;
  endfunction
  initial begin
    x = 20;
    y = 30;
    z = sum(x,y);
    $display("\tValue of x = %0d",x);
    $display("\tValue of y = %0d",y);
    $display("\tValue of z = %0d",z);
  end
endmodule
```

Result:-

```
        Value of x = 20
        Value of y = 30
        Value of z = 80
 Simulation has finished.
```

“Argument pass by reference”:-

- In pass-by-reference, a reference to the original argument is passed to the subroutine.
- As the argument within a subroutine is pointing to an original argument, any changes to the argument within the subroutine will be visible outside.
- To indicate argument pass by reference, the argument declaration is preceded by keyword ref

Code practicing:-

```
module tb;
  int x,y,z;
  function automatic int sum(ref int x,y);
    x = x+y;
    return x+y;
  endfunction
  initial begin
    x = 20;
    y = 30;
    z = sum(x,y);
    $display("\tvalue of x = %0d",x);
    $display("\tvalue of y = %0d",y);
    $display("\tvalue of z = %0d",z);
  end
endmodule
```

Result:-

```
        value of x = 50
        value of y = 30
        value of z = 80
Simulation has finished.
```

Note:-

Any modifications to the argument value in a pass-by-reference can be avoided by using the const keyword before ref, any attempt to change the argument value in the subroutine will lead to a compilation error.

“Default Argument Values”:-

- The default value can be specified to the arguments of the subroutine.
- In the subroutine call, arguments with a default value can be omitted from the call.
- If any value is passed to an argument with a default value, then the new value will be considered.

Code practicing:-

```
module tb;
  int q;
  function int sum(int x=1,y=2,z=3);
    return x+y+z;
  endfunction
  initial begin
    q = sum( ,4 , );
    $display("value of q = %0d",q);
  end
endmodule
```

Result:-

```
value of q = 8
Simulation has finished.
```

“Argument pass by value”:-

In argument pass by name, arguments can be passed in any order by specifying the name of the subroutine argument.

Code practicing:-

```
module tb;
  function void display(int x,string y);
    $display("value of x = %d, y = %s",x,y);
  endfunction
  initial begin
    display(.y("VLSI"),.x(1));
  end
endmodule
```

Result:-

```
value of x = 1, y = VLSI
Simulation has finished.
```