DAY-94
#100DAYSRTL

"UVM: UVM Object(Part-2)"

"Inbuild Implementation: Copy":-

Shallow vs Deep copy:-

- In the case of Deep Copy we have independent instances of the class
- In a Shallow copy we have single instances that are accessible from all the instances that copy the original class.

"Code Practising":-

```
`include "uvm_macros.svh"
import uvm_pkg::*;
class temp extends uvm_object;
  bit [3:0] data_temp;
  function new(string inst = "temp");
  super.new(inst);
  endfunction
  `uvm_object_utils_begin(temp)
  `uvm_field_int(data_temp, UVM_DEFAULT)
  `uvm_object_utils_end
endclass
class transaction extends uvm_sequence_item;
 rand bit [3:0] data;
 temp t;
function new(string inst = "transaction");
super.new(inst);
t = new("t");
endfunction
  `uvm_object_utils_begin(transaction)
  `uvm_field_int(data, UVM_DEFAULT)
  `uvm_field_object(t, UVM_DEFAULT)
  `uvm_object_utils_end
endclass
module tb;
transaction tr_a, tr_b;
initial begin
  ////////adding constructor to both instances
  tr_a = new("tr_a");
  tr_b = new("tr_b");
  ///////////////generate random data for one of instance
  tr_a.randomize();
  tr_a.t.data_temp = 4'b0011;
  tr_a.print();
  ////////////////////copy the content of instance a to b
  tr_b.copy(tr_a);
  tr_b.print();
  ////////////////////update the content from any one instance
```

"Result":-

```
----------------------------------------
Name           Type         Size  Value
----------------------------------------
tr_a           transaction  -     @335
  data         integral     4     'h6
  t            temp         -     @338
    data_temp  integral     4     'h3
----------------------------------------
----------------------------------------
Name           Type         Size  Value
----------------------------------------
tr_b           transaction  -     @339
  data         integral     4     'h6
  t            temp         -     @341
    data_temp  integral     4     'h3
----------------------------------------
----------------------------------------
Name           Type         Size  Value
----------------------------------------
tr_a           transaction  -     @335
  data         integral     4     'h6
  t            temp         -     @338
    data_temp  integral     4     'h3
----------------------------------------
----------------------------------------
Name           Type         Size  Value
----------------------------------------
tr_b           transaction  -     @339
  data         integral     4     'h6
  t            temp         -     @341
    data_temp  integral     4     'h0
----------------------------------------
Simulation has finished. There are no more test vectors to simulate.
```

“Do Hook: Copy”:-

“Code Practising”:-

```
`include "uvm_macros.svh"
import uvm_pkg::*;
class temp extends uvm_object;
 `uvm_object_utils(temp)
  bit [3:0] data_temp;
  function new(string inst = "temp");
  super.new(inst);
  endfunction
  virtual function void do_print(uvm_printer printer);
  super.do_print(printer);
  printer.print_field("data_temp", data_temp, $bits(data_temp), UVM_DEC);
  endfunction
endclass
class transaction extends uvm_sequence_item;
  `uvm_object_utils(transaction)
 rand bit [3:0] data;
 temp t;
function new(string inst = "transaction");
super.new(inst);
t = new("t");
endfunction
  virtual function void do_print(uvm_printer printer);
  super.do_print(printer);
  printer.print_field("data", data, $bits(data), UVM_DEC);
  printer.print_object("t", t);
  endfunction
  virtual function void do_copy(uvm_object rhs);
    transaction tr;
    super.do_copy(rhs);
    $cast(tr, rhs);
    data = tr.data;
    t.data_temp = tr.t.data_temp;
  endfunction
endclass
module tb;
transaction tr_a, tr_b;
initial begin
  ////////adding constructor to both instances
  tr_a = new("tr_a");
  tr_b = new("tr_b");
  ///////////////generate random data for one of instance
  tr_a.randomize();
  tr_a.t.data_temp = 4'b0011;
  tr_a.print();
  /////////////////copy the content of instance a to b
  tr_b.copy(tr_a);
  tr_b.print();
  /////////////////update the content from any one instance
  tr_b.t.data_temp = 4'b0000;
  tr_a.print();
  tr_b.print();
end
endmodule
```

“Result”:-

```
Name            Type         Size  Value
----------------------------------------
tr_a            transaction  -     @335
  data          integral     4     'h6
  t             temp         -     @338
    data_temp   integral     4     'h3
----------------------------------------
----------------------------------------
Name            Type         Size  Value
----------------------------------------
tr_b            transaction  -     @339
  data          integral     4     'h6
  t             temp         -     @341
    data_temp   integral     4     'h3
----------------------------------------
----------------------------------------
Name            Type         Size  Value
----------------------------------------
tr_a            transaction  -     @335
  data          integral     4     'h6
  t             temp         -     @338
    data_temp   integral     4     'h3
----------------------------------------
----------------------------------------
Name            Type         Size  Value
----------------------------------------
tr_b            transaction  -     @339
  data          integral     4     'h6
  t             temp         -     @341
    data_temp   integral     4     'h0
```

“Create Method”:-

“Code Practising”:-

```
`include "uvm_macros.svh"
 import uvm_pkg::*;
////////////////////////////////////////////
////all the classes -> create
////tlm ports -> new
class transaction extends uvm_sequence_item;
  rand bit [3:0] a;
  rand bit [3:0] b;
       bit [4:0] y;
  function new(input string inst = "transaction");
  super.new(inst);
  endfunction
`uvm_object_utils_begin(transaction)
  `uvm_field_int(a,UVM_DEFAULT)
  `uvm_field_int(b,UVM_DEFAULT)
  `uvm_field_int(y,UVM_DEFAULT)
`uvm_object_utils_end
endclass
module tb;
  transaction tr;
  initial begin
    tr = transaction::type_id::create("tr");
    tr.randomize();
    tr.print();
  end
endmodule
```

“Result”:-

```
----------------------------
Name  Type         Size  Value
----------------------------
tr    transaction  -     @335
  a   integral     4     'h6
  b   integral     4     'h5
  y   integral     5     'h0
----------------------------
Simulation has finished. There are no more test vectors to simulate.
```