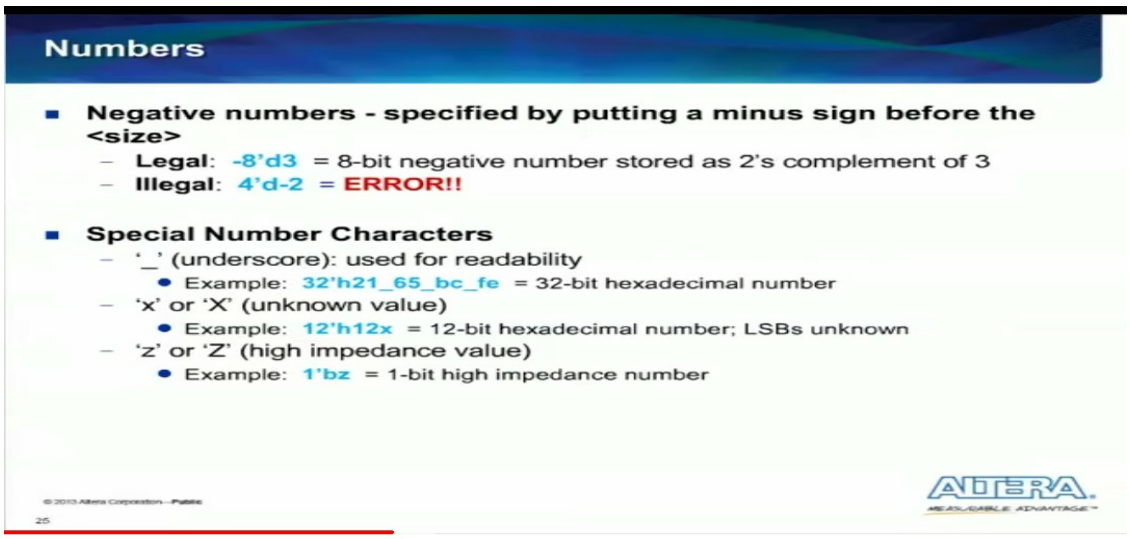
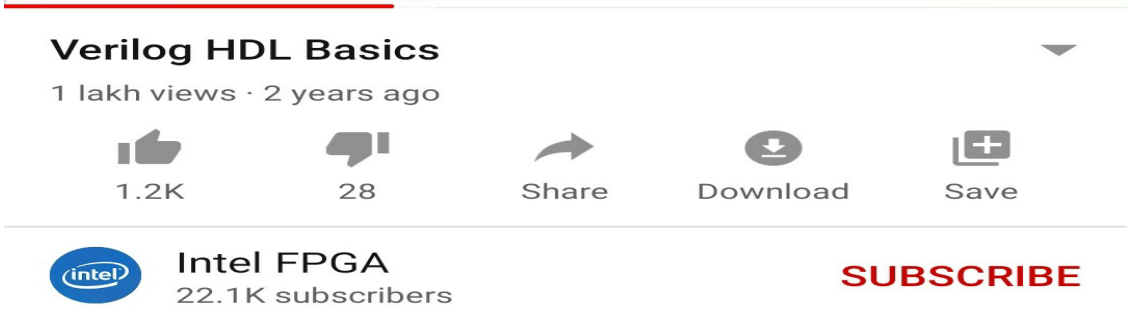
DAILY ASSESSMENT FORMAT

Date:	02-06-2020	**Name:**	K Muthu
Course:	DIGITAL DESIGN USING HDL	**USN:**	4al17ec038
Topic:	• FPGA Basics: Architecture, Applications and UsesFPGA Business Fundamentals • Verilog HDL Basics by Intel • Task	**Semester & Section:**	6 & 'A'
Github Repository:	K.Muthu-courses		

FORENOON SESSION DETAILS

Image of session





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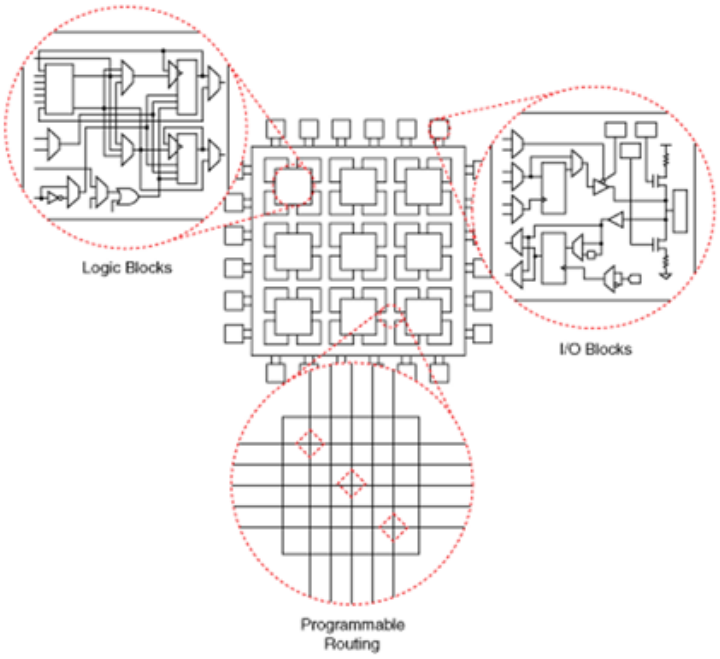
FPGA Basics: Architecture, Applications and Uses :

The FPGA is an integrated circuit that consists of internal hardware blocks with user-programmable interconnects to customize operation for a specific application.

- **Architecture :**

  A basic FPGA architecture consists of thousands of fundamental elements called configurable logic blocks (CLBs) surrounded by a system of programmable interconnects, called a fabric, that routes signals between CLBs.



- **Application :**
  - ✓ Broadcast
  - ✓ Consumer
  - ✓ Embedded Vision
  - ✓ Medical
  - ✓ Military / Aerospace / Government
  - ✓ Wireless & Wireline

- **Uses :**
  - ✓ Microsoft is using FPGAs in its data centers to run Bing search algorithms.
  - ✓ The FPGA can change to support new algorithms as they are created.
  - ✓ If needs change, the design can be repurposed to run simulation or modeling routines in an HPC application.
  - ✓ This flexibility is difficult or impossible to achieve with an ASIC.

Verilog HDL Basics by Intel :

- Verilog is a HARDWARE DESCRIPTION LANGUAGE (HDL).
- It is a language used for describing a digital system like a network switch or a microprocessor or a memory or a flip–flop.
- It means, by using a HDL we can describe any digital hardware at any level.
- Verilog supports a design at many levels of abstraction. The major three are –
  - ✓ Behavioral level
  - ✓ Register-transfer level
  - ✓ Gate level

- **Behavioral level** - This level describes a system by concurrent algorithms (Behavioural). Every algorithm is sequential, which means it consists of a set of instructions that are executed one by one. Functions, tasks and blocks are the main elements. There is no regard to the structural realization of the design.
- **Register–Transfer Level -** Designs using the Register–Transfer Level specify the characteristics of a circuit using operations and the transfer of data between the registers. Modern definition of an RTL code is "Any code that is synthesizable is called RTL code".
- **Gate Level** - Within the logical level, the characteristics of a system are described by logical links and their timing properties. All signals are discrete signals. They can only have definite logical values (`0', `1', `X', `Z`). The usable operations are predefined logic primitives (basic gates).

Task : Implement a 4:1 MUX and write the test bench code to verify the module

Verilog code :

```
module mux4_1(a, s, o);
input [3:0] a;
input [1:0] s;
output reg o;
always @(a or s)
begin
case (s)
2'b00:o=a[0];
2'b01:o=a[1];
2'b10:o=a[2];
2'b11:o=a[3];
default:o=0;
endcase
end
endmodule
```

Testbench code :

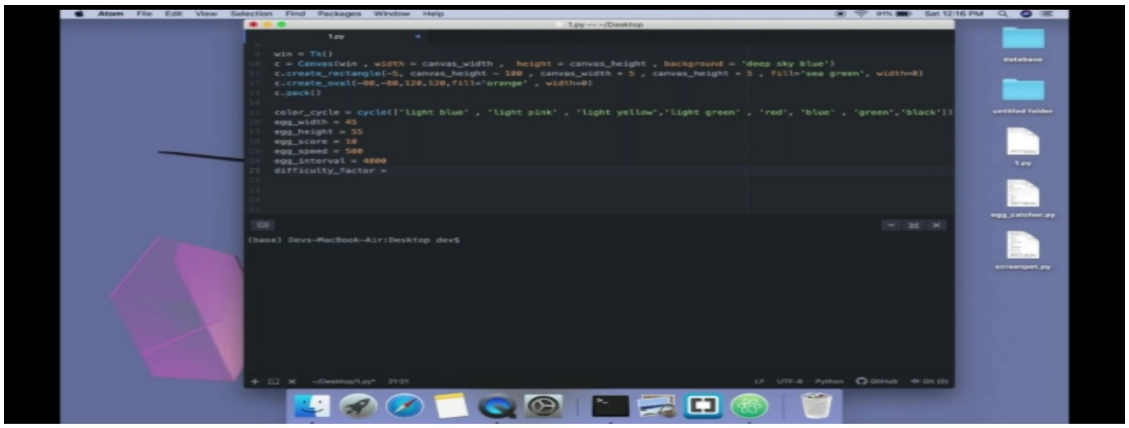
```
module muxt_b;
reg [3:0] a;
reg [1:0] s;
wire o;
mux4bit uut (.a(a),   .s(s),.o(o));
initial begin
#10 a=4'b1010;
```

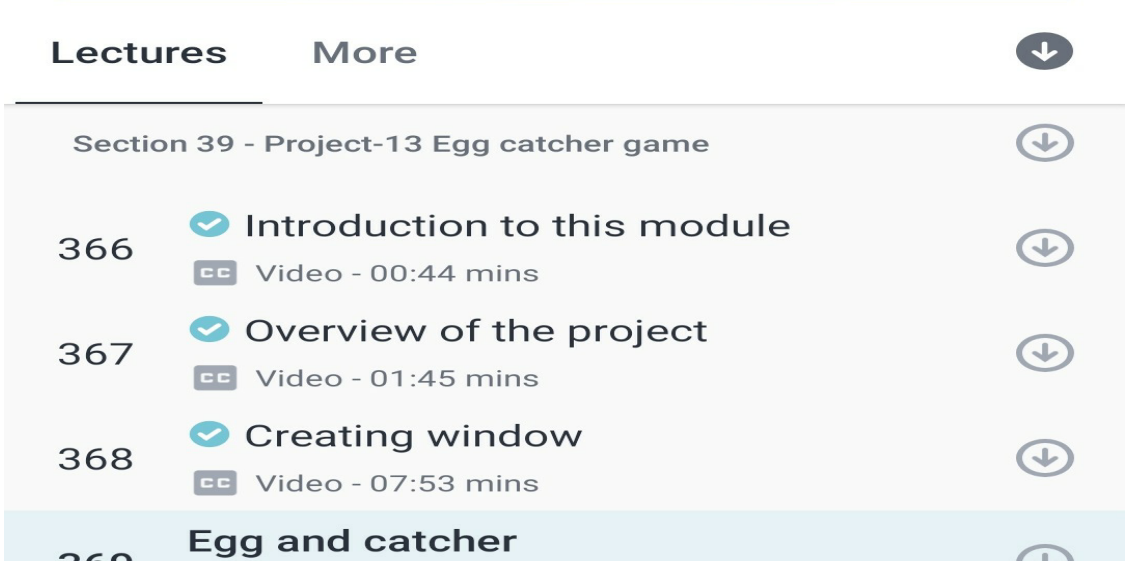
```
#10 s=2'b00;
#10 s=2'b01;
#10 s=2'b10;
#10 s=2'b11;
#10 $stop;
end
endmodule
```

Date:	**02-06-2020**	**Name:**	**K Muthu**
Course:	**Python Bootcamp 2020 build 15 working applications and Games**	**USN:**	**4al17ec038**
Topic:	Egg catcher game	**Semester & Section:**	**6 & 'A'**

AFTERNOON SESSION DETAILS

Image of session





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Egg catcher game :

- A Egg catcher game is programmed using TKinter module package of python library.
- Tkinter is the standard GUI library for Python.
- Python when combined with Tkinter provides a fast and easy way to create GUI applications.
- Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit.
- Creating a GUI application using Tkinter is an easy task.
- Steps involved in creating the egg catcher game are,
  - ✓ Import the Tkinter module.
  - ✓ Create the GUI application main window.
  - ✓ Add the required widgets to the GUI application.
  - ✓ Enter the main event loop to take action against each event triggered by the user.