Compiling and Running Verilog Modules Using ICARUS:

1. **Write the verilog module:**

   ```
   module example_ckt (z, x, y);
           input x, y;
           output z;
           assign z = x & y;
   endmodule
   ```

   and save the module in file **"example_ckt.v"**

2. **Write the corresponding test bench**:

   ```
   module example_tb;
           reg t_x, t_y;
           wire t_z;

           example_ckt ckt ( t_z, t_x, t_y );

           initial begin
                   $dumpfile ("example_ckt.vcd");
                   $dumpvars (0, example_tb);
                   $monitor (t_x, t_y, t_z);

                   t_x = 1'b0; t_y= 1'b0;
           #5  t_x = 1'b0; t_y= 1'b1;
           #5  t_x = 1'b1; t_y= 1'b0;
           #5  t_x = 1'b1; t_y= 1'b1;
           end
   endmodule
   ```

   and save the module in file **"example_tb.v"**

3. **Compile the verilog module along with the test bench using iverilog command:**
   Open a terminal (command prompt in windows) and type the following command to compile the modules created in step 1 & 2 and save the output in file "**example**"

   ```
   iverilog -o example example_ckt.v example_tb.v
   ```

4. **Run the compiled output file using vvp command:**
   After compiling modules using step 3, type the following command to run the generated output file "**example**"

   ```
   vvp example
   ```

5. **Display the wave form:**
      To show the waveform, type the following command along with the dump file
      "example_ckt.vcd"

      gtkwave example_ckt.vcd

Note: To carry out step 3, 4 & 5 verify that ICARUS as well as GTKWave is properly installed and in windows platform the PATH environment variable is set properly.

Setting PATH environment variable in Windows:
      Assume that ICARUS is installed in **C:\iverilog** folder. Please verify the installation path in your system and replace **C:\iverilog** with this installation path.

     i.   Opent **System Properties** window.
     ii.   Select **Advanced** tab and click on **Environment Variables**
     iii.   Select the **PATH** system variable and click on **Edit**
     iv.   Add the following path:
         a. C:\iverilog\bin
         b. C:\iverilog\gtkwave\bin
     v.   After adding the path click on OK to update the **PATH** environment variable on both **Edit environment variable** & **Environment Variables** window