**DAILY ASSESSMENT FORMAT**

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| **Date:** | **1-06-2020** | **Name:** | **RACHANA C HULIKATTI** |
| **Course:** | **DIGITAL DESIGN USING HDL** | **USN:** | **4AL17EC108** |
| **Topic:** | **INDUSTRY APPLICATION,BUSINESS**  **FUNDAMENTALS OF HDL,FPGA VS**  **ASIC.** | **Semester & Section:** | **6TH B** |
| **Github**  **Repository:** |  |  |  |

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| **FORENOON SESSION DETAILS** |
| **Image of session** |
| **Report – Report can be typed or hand written for up to two pages.**    FPGA Basics – A Look Under the Hood An introductory look inside Field Programmable Gate  Arrays. We’ll go over:Strengths & Weaknesses of FPGAs How FPGAs work  What’s inside an FPGA So you keep hearing about FPGAs being utilized in more and more applications, but aren’t sure whether it makes sense to switch to a new technology. Or maybe you’re |

software.You’re designing a digital circuit. You’re using code to tell the chip how to configure itself.Plan for lots of bugs – yes, plan for them.

They are going to happen. Way more than you expected. If you’re a newbie developer, you need to pull in someone that has experience with FPGA development to help with this estimate.Application-specific realities – you ought to concern yourself with realities revolving around cyber security and safety,

FPGAs are a different animal than what you’re likely used to.What is an FPGA?An FPGA is a (mostly) digital, (re-)configurable ASIC. I say mostly because there are analog and mixed-signal aspects to modern FPGAs.

For example, some have A/D converters and PLLs. I put re- in parenthesis because there are actually one-timeprogrammable FPGAs, where once you configure them, that’s it, never again. However, most FPGAs you’ll come across are going to be re-configurable.

So what do I mean by digitally configurable ASIC?I mean that at the core of it, you’re designing a digital logic circuit, as in AND, OR, NOT, flip-flops, etc.

Of course that’s not entirely accurate and there’s much more to it than that, but that is the gist at its core.he players –There are currently two big boys: Altera (part of Intel) and Xilinx, and some supporting players (e.g. Actel (owned by Microsemi)).

The main underlying technology options are SRAM-based (this is the most common technology), flash, and anti-fuse. As you might imagine, each option has its own pros and cons.

Check this out for some more details.Strengths / best suited for:Much of what will make it worthwhile to utilize an FPGA comes down to the low-level functions being performed within the device.

There are four processing/algorithm attributes defined below that FPGAs are generally well-suited for.

While just one of these needs may drive you toward an FPGA, the more of these your application has, the more an FPGA-based solution will appeal.Parallel processes – if you need to process several input channels of information (e.g. many simultaneous A/D channels) or control several channels at once

**VERILOG CODE**

**module BasicGates(**

**input1, input2, output\_and, output\_or, output\_not, output\_nand, output\_nor, output\_xor**

**);**

**input input1; input input2; output output\_and; output output\_or; output output\_not; output output\_nand; output output\_nor; output output\_xor;**

**assign output\_and = input1 &amp; input2; assign output\_or = input1 | input2; assign output\_not = ~input1;**

**assign output\_nand = ~(input1 &amp; input2); assign output\_nor = ~(input1 | input2);**

**assign output\_xor = (~input1 &amp; input2) | (input1 &amp; ~input2);**

**endmodule**

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| **Date:** | **1-06-2020** | | **Name:** | **RACHANA C HULIKATTI** |
| **Course:** | **PYTHON PROGRAMMING** | | **USN:** | **4A17EC108** |
| **Topic:** | **BUILD A WEBCAM MOTION DETECTOR** | | **Semester & Section:** | **6TH B** |
|  | | **AFTERNOON SESSION DETAILS** | | | |
| **Image of session** | |  | | | |

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| **Report – Report can be typed or hand written for up to two pages.**    Motion detection is the detection of the change in the position of an object with respect to its surroundings and vice-versa.  Buckle up your seat belts to drive through this motion detector application along with me and your lovable Python.You may be able to perform the following tasks using this application,  though the list is non-exhaustive: 1) Find in front of screen time during working from home. 2)Monitor your child’s in front of screen time. 3) Find trespassing in your backyard. 4)Locate unwanted public/animal movements around yoroom/house/alley and what not…….Photo  by Williapm Thomas on Unsplash Hardware Requirements:  A computer with a webcam or any type of camera installed.Software Requirements: Python 3 or above.Additional Requirements: 30 mins of your time, Enthusiasm about the topic I will guide you step by step into building the application.  Firstly, you will capture the first frame via webcam. This frame will be treated as the baseline frame. Motion will be detected by calculating the phase difference between this baseline frame and the new frame with some object.  The new frames will be called Delta frame.Then you will refine your delta frame using pixel intensity. The refined frame will be called the Threshold frame.  Then you will apply some intricate image processing techniques like Shadow Removal, Dilation, Contouring, etc.  on the Threshold frame to capture substantial objects. Here is the screenshot of what you are going to achieve:Detected Object You will be able to capture the time stamp when an object entered the frame and exited the frame. Thus, you will be able to find the screen-on time.I won’t embed my code here as I would like you to improve the blood circulation on your fingertips.  To start with basic installations, please install python 3 or above, pandas, and opencv via pip. Once done, you are ready to begin:  STEP 1: Import required libraries:  STEP 2: Initialize variables, lists, data frames:You will get to know when each one of the above will be required in the below code.  STEP 3: Capture the video frames using webcam:OpenCV has in-built functions to open the camera and capture video frames. “0” denotes the camera at the hardware port number 0 in your computer. If you have multiple cameras or external cameras or a CCTV setup installed, you may provide the port number accordingly.  STEP 4: Converting the captured frame to gray-scale and applying Gaussian Blur to remove noise:We convert the color frame to gray frame as an extra layer of color is not required. |
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