|  |  |  |
| --- | --- | --- |
| 10.19.2016 |  | Pre-Lab Report |
|  |  | Pre-Study Summary  |  | | --- | | As a start, Quartus downloaded and learned from the pdf called manuel which is in classroom. Subsequently, the PreLab pdf observed and learned what to be need to done in Quartus. Afterwards, the circuit done, screenshots of the circuit and the circuits’ waveform taken.  Secondly, the theoretical information about the integrated circuits investigated for the laboratory.  Finally, all the informations interfiled in this report. | |

# Pre-Study Summary

Report Name

Logic Pre-Lab

Prepared By

Gül Eda Aydemir

School No

2015510013

|  |
| --- |
| As a start, Quartus downloaded and learned from the pdf called manuel which is in classroom. Subsequently, the PreLab pdf observed and learned what to be need to done in Quartus. Afterwards, the circuit done, screenshots of the circuit and the circuits’ waveform taken.  Secondly, the theoretical information about the integrated circuits investigated for the laboratory.  Finally, all the informations interfiled in this report. |

# Quartus ScreenShots

|  |
| --- |
| Experiment 1 –  a)Circuit      b) Waveform  Report Name  Logic Pre-Lab  Prepared By  Gül Eda Aydemir  School No  2015510013    Experiment 2.  a)Circuit    b)Waveform |

# About Integrated Circuits

|  |
| --- |
| * Breadboard to implement the circuits   A Breadboard or a Protoboard or Plug-board is a testing board used for testing of circuits before implementing them permanently on PCB. It is a simple plastic board which is wired from inside in a particular manner and you can test circuit comprising of IC's, resistors, capacitors and many other pin devices by just plugging it inside the holes provided.  Report Name  Logic Pre-Lab  Prepared By  Gül Eda Aydemir  School No  2015510013   * Connection Cables   Jumper wires typically vary in color and size depending on what they are being used for. In breadboards, jump wires are used to establish connections between the central micro controller and other devices such as buttons and sensors.   * NAND Gate (74LS00 or 74HC00)   The 74HC00; 74HCT00 is a quad 2-input NAND gate. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of VCC.   * AND Gate (74LS08)   This device contains four independent gates each of which performs the logic AND function.   * XOR Gate (74LS86)   This device contains four independent gates each of which performs the logic exclusive-OR function.   * OR Gate (IC 74LS32)   This device contains four independent gates each of which performs the logic OR function.   * NOT Gate (74LS14)   This device contains six independent gates each of which performs the logic INVERT function. Each input has hysteresis which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.  gates truth table ile ilgili görsel sonucu  Report Name  Logic Pre-Lab  Prepared By  Gül Eda Aydemir  School No  2015510013   * Demultiplexer (74LS138)   These Schottky-clamped circuits are designed to be used in high-performance memory-decoding or data-routing applications, requiring very short propagation delay times. In high-performance memory systems these decoders can be used to minimize the effects of system decoding. When used with high-speed memories, the delay times of these decoders are usually less than the typical access time of the memory. This means that the effective system delay introduced by the decoder is negligible. The DM74LS138 decodes one-of-eight lines, based upon the conditions at the three binary select inputs and the three enable inputs. Two active-low and one active-high enable inputs reduce the need for external gates or inverters when expanding. A 24-line decoder can be implemented with no external inverters, and a 32-line decoder requires only one inverter. An enable input can be used as a data input for demultiplexing applications. The DM74LS139 comprises two separate two-line-to-fourline decoders in a single package. The active-low enable input can be used as a data line in demultiplexing applications. All of these decoders/demultiplexers feature fully buffered inputs, presenting only one normalized load to its driving circuit. All inputs are clamped with high-performance Schottky diodes to suppress line-ringing and simplify system design.  • Demultiplexer Truth table ile ilgili görsel sonucu  Report Name  Logic Pre-Lab  Prepared By  Gül Eda Aydemir  School No  2015510013   * Multiplexer (74LS151)   This data selector/multiplexer contains full on-chip decoding to select the desired data source. The DM74LS151 selects one-of-eight data sources. The DM74LS151 has a strobe input which must be at a low logic level to enable these devices. A high level at the strobe forces the W output HIGH, and the Y output LOW. The DM74LS151 features complementary W and Y outputs  multiplexer truth table ile ilgili görsel sonucu   * D Flip Flop   In electronics, a flip-flop or latch is a circuit that has two stable states and can be used to store state information. A flip-flop is a bistable multivibrator. The circuit can be made to change state by signals applied to one or more control inputs and will have one or two outputs. It is the basic storage element in sequential logic. Flip-flops and latches are fundamental building blocks of digital electronics systems used in computers, communications, and many other types of systems.  d flip flop truth table ile ilgili görsel sonucu  Report Name  Logic Pre-Lab  Prepared By  Gül Eda Aydemir  School No  2015510013   * JK Flip Flop   A JK flip-flop has two inputs similar to that of RS flip-flop. We can say JK flip-flop is a refinement of RS flip-flop. JK means Jack Kilby, a Texas instrument engineer who invented IC. The two inputs of JK Flip-flop is J (set) and K (reset). A JK flip-flop is nothing but a RS flip-flop along with two AND gates which are augmented to it. |

# References

Report Name

Logic Pre-Lab

Prepared By

Gül Eda Aydemir

School No

2015510013

| Item | From |
| --- | --- |
| 1. | http://www.kkhsou.in/main/EVidya2/computer\_science/logic\_gates.html |
| 2. | http://www.electronics-tutorial.net/combinational-logic-circuits/demultiplexers/ |
| 3. | https://sginfobmt.wordpress.com/2014/09/27/multiplexer/ |
| 4. | http://macao.communications.museum/eng/exhibition/secondfloor/MoreInfo/FlipFlop.html |
| 5. | http://www.brighthubengineering.com/diy-electronics-devices/46610-jk-and-t-flip-flops/#imgn\_0 |
| 6. | https://en.wikipedia.org/wiki/Flip-flop\_(electronics) |
| 7. | http://www.futurlec.com/74LS/74LS151.shtml |
| 8. | http://www.futurlec.com/74LS/74LS138.shtml |
| 9. | http://web.mit.edu/6.115/www/document/dm74ls14.pdf |
| 10. | http://www.futurlec.com/74LS/74LS32.shtml |
| 11. | http://www.futurlec.com/74LS/74LS86.shtml |
| 12. | http://www.futurlec.com/74LS/74LS08.shtml |
| 13. | http://www.nxp.com/documents/data\_sheet/74HC\_HCT00.pdf |