**Final DLD Projects titles and descriptions**

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|  | 2D  LED Digit Generator | 1. Construct a 10x10 or 15x15 LED Square Board that will be operated through multiplexer (16:1) 2. Based on given decimal number as input to the MUX, the board will show corresponding decimal digit through those LEDs on the board. |
|  | 2D  LED English Letter Generator | 1. Construct a 10x10 or 15x15 LED Square Board that will be operated through multiplexer (32:1) 2. Based on given English character as input to the MUX (assumed by programmer anyway), the board will show corresponding characters through those LEDs on the board. |
|  | LED based 2D matrix traveler | 1. Use the LED 10x10 matrix to display 2D grid. 2. A LED light will be turned on at a time, but in this case, each LED will gets chance to be turned on equally for 0.5 sec 3. Follow a pattern so that all LEDs can turned on sequentially |
|  | 7 segment Digit display | 1. Use 7 segment display, multiplexer, encoder to turn on the expected digit given as input by user. |
|  | 4 bit binary  ADDER Calculator | 1. User will give two 4 bit binary number 2. The circuit will be able to add them and show the result through 7 segments display 3. It will be also able to notify is there any overflow is occurred or not. |

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|  | 4 bit binary  SUBTRACTOR  Calculator | 1. User will give two 4 bit binary number 2. The circuit will be able to subtract them and show the result through 7 segments display 3. It will be also able to notify is there any underflow is occurred or not. 4. The result should be in regular form where if the number is negative it should show it through negative sign. |
|  | 4 bit binary  MULTIPLIER Calculator | 1. User will give two 4 bit binary number 2. The circuit will be able to multiply them and show the result through 7 segments display 3. You have to calculate by yourself how many 7 segments display will be required for any random binary number containing at most 4 bits in any number. |
|  | Password based Door Lock System (Circuit breaker) | 1. In this system, one door (can be designed as red and green LED) will controlled based on binary password. 2. A 6 bit password will be stored in memory. A user/ person, who wants to access to the room, must enter password through switches. 3. If the password is matched, the door will be open (Green LED). Otherwise the door will be closed (Red LED) |

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|  | Digital Smart Room | 1. The room should be able to detect and display the number of people inside (you can use two switches to control enter and leave pressing separately. If Switch A is pressed a person will enter and if Switch B is pressed a person will leave. Pressing several times will increase/ decrease the number) 2. It should keep a track of when someone enters the room and when someone leaves 3. The number of lights (LED 1) and fans (LED 2) turning on in the room should be proportional to the number of people in |
|  | Traffic control system for a cross road | 1. 4 roads in cross section have 3 lights (Green, yellow and red) each 2. You have to play a role of a traffic controller in a traditional way so that no accident can be occurred 3. You can take help from traffic control guide to do this task 4. You have to keep 4 memories (buffer) for each of road to keep track how many vehicles are there in each road. 5. Each road will increase its number of vehicles slower than the speed of decreasing the number of vehicles 6. You are suggested to use multiplexer, clock of different frequency and other common combinational logic circuits |

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|  | Vending Machine | 1. A vending machine has different items to sell to the customer having different prices 2. User can request for different items through different switches 3. When a product is sold out that particular counter will be decremented 4. Gradually “total money” counter will be increased based on the item’s price weighted separately. |
|  | Pattern/ Sequence Counter | 1. In bits stream you have to count how many times a particular sequence has been occurred 2. That sequence can be stored in a register (a group of flip flops) 3. Each time that sequence occurred, the counter value will be increased by one |
|  | Target Shooting game | 1. In 3x3 LED matrix, randomly an LED will be turned in that grid, user have to fix the coordinate of that LED with in very short time 2. User will give the coordinate of that LED through 3x3 switch matrix 3. If they are matched, user score will be upgraded by one. |
|  | 4 bit Ring counter | 1. Theory discussed in book 2. Values in binary should be represented in two 7 segments displays |
|  | 4 bit Jonson counter | 1. Theory discussed in book 2. Values in binary should be represented in two 7 segments displays |
|  | Cross road challenge | 1. A car has 2 head lights and 2 back lights, these will be operated by the user using multiplexer 2. It has four options – turn left, turn right, go forward and go backward. 3. Based on these options those head lights and back lights should be turned on following general rules for a vehicle |
|  | Water Tank Control Mechanism | 1. A random water level will be displayed by a 7 segment display 2. There should have a certain maximum and minimum water level for that tank 3. There should have a switch that will decrease the water level based on user input. 4. If the water level goes beyond minimum, automatically it will increase the water level up to maximum level gradually (using a counter) 5. If maximum level is reached, automatically it will cut off the supply (just stop the counter and reposition to 0) |
|  | Temperature Controlled Fan | 1. You are asked to control the speed of the fan based on temperature 2. Temperature will be controlled by user 3. Based on temperature fan will speed up or down |
|  | Digital clock | 1. As per rule |
|  | Stop watch | 1. As per rule |
|  | Digital Timer | 1. As per rule 2. User will set the time which will be stored in a register (group of flip flops) |
|  | Bidirectional blinking light | 1. In this project, there will be a 10X1 LED matrix 2. If the switch is on, LEDs will be turning on and off sequentially from one direction to another and after touching the end LED it will be moving back 3. Thus it will be going back and forth until the switch is off. |
|  | 1 Counter | 1. From a given time sequence, time can be presented in binary form 2. In a particular value of time period, 1 and 0 will be appeared 3. Your task is to count total number of 1s appeared so far and display it in 7 segment display continuously |
|  | Random Number Generator | 1. You have to generate random number following any easy algorithm where no sequence cannot be made ever within 0 to 31. 2. That random number should be displayed using two 7 Segment Displays |

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|  | Unbiased Digital Dice with LEDs | 1. Digital dice where the dots are defined by 6 LEDs 2. You have to make it unbiased so that nobody can guess its value earlier 3. Each time switch is on, it will show random number of LEDs tured on from 1 to 6 |
|  | Multi converter | 1. Your task is converting given value in binary to any other system based on user choice through multiplexer 2. You can convert your value to grey, excess 3, 24-2-1 and so on based on your choice |