

CEN 335 MIPS Single Cycle Processor Project Description

1. Realize the Single-cycle Datapath circuit of the MIPS processor using Max-Plus II, using a 16-bit internal bus instead of 32.
2. Register file contains 8 x 16-bit registers
3. Each instruction is as below:

R type: add, sub, and, or, slt instructions

OPCODE(4)	Rs (3)	Rt(3)	Rd(3)	EXOP(3)
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I type: beq, addi, subi, sw, lw instructions

OPCODE(4)	Rs (3)	Rt(3)	Data (6)
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J type: j instruction

OPCODE(4)	Address (12)
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4. For the following code, workout the code in binary and show that it works in your processor :

```
#include <stdio.h>
```

```
int main () {  
    int a[8]={2,1,3,5,7,4,4,1};  
    int sum = 0;  
  
    for (i = 0; i <= 7; i = i + 1)  
        sum = sum + a[i];  
  
    printf ("The sum is %d\n", sum);  
}
```

The deliveries for this project:

1. ALU Design (will be graded in Lab. study)
2. Instruction Memory / Data Memory (will be graded in Lab. study)
3. Control Unit (will be graded in Lab. study)
4. Register File (will be graded in Lab. study)
5. Integration of CPU components and demonstration of the sample code given below. and a comprehensive report including the integration. (will be graded in your Final exam's day, you should make a demo in class)