**关于测试多周期CPU的简单方法**

1. 测试程序段

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **地址** | **汇编程序** | **指令代码** | | | | | |
| **op（6）** | **rs(5)** | **rt(5)** | **rd(5)/immediate (16)** | **16进制数代码** | |
| **0x00000000** | addiu $1,$0,8 | 001001 | 00000 | 00001 | 0000000000001000 | **=** | 24010008 |
| **0x00000004** | ori $2,$0,2 |  |  |  |  |  |  |
| **0x00000008** | xori $3,**$2**,8 |  |  |  |  |  |  |
| **0x0000000C** | sub $4,**$3**,$1 |  |  |  |  |  |  |
| **0x00000010** | and $5,**$4**,$2 |  |  |  |  |  |  |
| **0x00000014** | **sll $5,$5,2** |  |  |  |  |  |  |
| **0x00000018** | **beq $5,$1,-2(=,转14)** |  |  |  |  |  |  |
| **0x0000001C** | **jal 0x0000050** |  |  |  |  |  |  |
| **0x00000020** | **slt $8,$13,$1** |  |  |  |  |  |  |
| **0x00000024** | **addiu $14,$0,-2** |  |  |  |  |  |  |
| **0x00000028** | **slt $9,$8,$14** |  |  |  |  |  |  |
| **0x0000002C** | **slti $10,$9,2** |  |  |  |  |  |  |
| **0x00000030** | **slti $11,$10,0** |  |  |  |  |  |  |
| **0x00000034** | add $11,**$11**,$10 |  |  |  |  |  |  |
| **0x00000038** | **bne $11,$2,-2 (≠,转34)** |  |  |  |  |  |  |
| **0x0000003C** | addiu $12,$0,-2 |  |  |  |  |  |  |
| **0x00000040** | addiu $12,$12,1 |  |  |  |  |  |  |
| **0x00000044** | **blez $12,-2 (**≤0,**,转40)** |  |  |  |  |  |  |
| **0x00000048** | andi $12,$2,2 |  |  |  |  |  |  |
| **0x0000004C** | **j 0x000005C** |  |  |  |  |  |  |
| **0x00000050** | sw $2,4($1) |  |  |  |  |  |  |
| **0x00000054** | lw $13,4($1) |  |  |  |  |  |  |
| **0x00000058** | **jr $31** |  |  |  |  |  |  |
| **0x0000005C** | **halt** | 111111 | 00000 | 00000 | 0000000000000000 | **=** | FC000000 |
|  |  |  |  |  |  |  |  |

1. 将**指令代码初始化到指令存储器**中，直接写入。
2. 初始化PC的值，也就是以上程序段首地址PC=**0x00000000**，以上程序段从**0x00000000**地址开始存放。
3. 运行Xilinx Vivado进行仿真，看波形。