Project Report CS220

- Aayush Singh 220024

- Reddi Pallavi 230850

PSD1

* The following Registers are 32 bit long

|  |  |  |
| --- | --- | --- |
| Name | Register | Usage |
| $s0 - $s23 | 0-23 | General purpose |
| $mult\_hi | 24 | Multiply result high |
| $mult\_lo | 25 | Multiply result low |
| $s26 - $s27 | 26-27 | General purpose |
| $gp | 28 | Global pointer |
| $sp | 29 | Stack pointer |
| $fp | 30 | Frame pointer |
| $ra | 31 | Return address |

PSD2

1. Size for instruction – 32 bit
2. Size for data memory – 2^15 bits
3. Size for instruction memory – 2^15 bits

PSD3

1. The layout for R-type instruction is:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 6 bits | 5 bits | 5 bits | 5 bits | Do not Care | Do not Care |
| opcode | rs | rt | rd |  |  |

* It is 32 bits long.
* Bit 31 to bit 26 is used to store the operation code for the instruction.
* Bit 25 to bit 21 is used to store the number of the register that is the first source operand.
* Bit 20 to bit 16 is used to store the number of the register that is the second source operand.
* Bit 15 to bit 11 is used to store the number of the register that is the destination.

1. The layout for I-type instruction is:

|  |  |  |  |
| --- | --- | --- | --- |
| 6 bits | 5 bits | 5 bits | 16 bits |
| opcode | rs | rd | immediate |

* It is 32 bits long.
* Bit 31 to bit 26 is used to store the operation code for the instruction.
* Bit 25 to bit 21 is used to store the number of the register that stores the source register.
* Bit 20 to bit 16 is used to store the number of the register that stores the destination register.
* Bit 15 to bit 0 stores the immediate value or offset (used for computations or memory addressing).

1. The layout for J-type instruction is:

|  |  |
| --- | --- |
| 6 bits | 26 bits |
| opcode | address |

* It is 32 bits long.
* Bit 31 to bit 26 is used to store the operation code for the instruction.
* Bit 25 to bit 0 stores the target address (used for jump instructions to specify the destination address).