CS220

Assignment 7

Project Report

1. PDS1:

Number	Name	Comments
$0 - $4, $9-$11	$s0, ..., $s7	Saved Registers
$5-$7, $12-$16	$t0, ..., $t7	Temporary Registers
$8	$zero	Zero Register
$17 - $27	$f0 - $f11	Floating Point Registers
$28	$gp	Global Pointer
$29	$sp	Stack Pointer
$30	$fp	Frame Pointer
$31	$ra	Return Address

2. PDS2:

We have decided to keep the size of the instruction memory as 64*32 as we need 14 instructions to execute Bubble Sort. The rest of the memory is kept as backup, just in case we need more instructions for some other execution.

For the data memory, we have decided to keep the size as 64*32, which can be changed if we want to increase the number of inputs (we have kept number of inputs as 10 for now).

3. PDS3:

We have decided to keep the instruction layout for R-, I-, and J- type instructions and their encoding methodologies the same as in MIPS.

- R-Format:

op	rs	rt	rd	shamt	funct
6 bits	5 bits	5 bits	5 bits	5 bits	6 bits

- I-Format:

op	rs	rt	immediate
6 bits	5 bits	5 bits	16 bits

- J-Format:

op	address
6 bits	26 bits

We have also decided to keep the opcodes (and funct) of the instructions the same as in MIPS (with necessary changes made for new instructions, i.e., opcodes for similar instructions in MIPS given to these instructions.

For some instructions (e.g. jump), we have changed the way the instruction works. Instead of adding the data to the program counter, we have directly changed the program counter to update to the new location.