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Computer Architecture Project

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1) Instruction format

- Instruction Bits details

  There will be 2 types of instructions : -

  - **16 bit instruction**

T	operation	func	rd	rs	rt	xxxx
15	15/14	13/12	10/9	7/6	4/3	1 0

  - **32 bit instruction**

T	operation	func	rd	rs	xxxx	Offset/immediate
31	31/30	29/28	26/25	23/22	20/19	16/15 0

- **Opcode of each instruction**
  - **16 bit instruction**

T (instruction type)	Correspond to
0	16 bit instruction
1	32 bit instruction

operation	Correspond to
0 0	1 – operand
0 1	2 – operand
1 0	Memory
1 1	Branch

Reg addresses	Correspond to
000	R0
001	R1
010	R2
011	R3
100	R4
101	R5
110	R6
111	R7

Operation type	function	Op code
1- operand	NOP	000
1- operand	HLT	001
1- operand	SETC	010
1- operand	NOT Rdst	011
1- operand	INC Rdst	100
1- operand	OUT Rdst	101
1 - operand	IN Rdst	110
2- operand	MOV	000
2- operand	ADD	001
2- operand	SUB	010

2- operand	AND	011
memory	PUSH	000
memory	POP	001
branch	JZ	000
branch	JN	001
branch	JC	010
branch	JMP	011
branch	CALL	100
branch	RET	101
branch	INT	110
branch	RTI	111

- **32 bit instruction**

  The op code will be the same except some changes

Operation op code	Correspond to
X 0	2- operand
X 1	memory

Operation type	function	Op code
2- operand	IADD	000
Memory	LDM	000
Memory	LDD	001
Memory	STD	010