



Lectures of Electrical Engineering Department

Subject Title: BRANCH GROUP

Class: 3 E&C

Lecture Contents	Lecture sequences:	First lecture	Instructor Name: Dr. Mohammed Younis															
	The major contents: 1- CONTROL INSTRUCTIONS 2-UNCONDITIONAL JMP 3- CONDITIONAL JMP SEE MY YOUTUBE CHANNEL FROM https://www.youtube.com/watch?v=aRnxiPzeebk&t=4s																	
	The detailed contents: <div>FLAG REGISTER TO REMEMBER</div> <div><div>15870</div><table><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>OF</td><td>DF</td><td>IF</td><td>TF</td><td>SF</td><td>ZF</td><td>x</td><td>AF</td><td>x</td><td>PF</td><td>x</td><td>CF</td></tr></table><div><div>~NV~UP~EI~PL~NZ~NA~PO~NC~</div><div>~NV~UP~EI~NG~NZ~AC~PE~CY~</div></div></div>			x	x	x	x	OF	DF	IF	TF	SF	ZF	x	AF	x	PF	x
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JMP BASED ON SINGLE FLAG

Mnemonic	Description	Flags/Registers
JZ	Jump if ZERO	ZF = 1
JE	Jump if EQUAL	ZF = 1
JNZ	Jump if NOT ZERO	ZF = 0
JNE	Jump if NOT EQUAL	ZF = 0
JC	Jump if CARRY	CF = 1
JNC	Jump if NO CARRY	CF = 0
JCXZ	Jump if CX = 0	CX = 0

JMP BASED ON SINGLE FLAG

(CONTINUED)

Mnemonic	Description	Flags/Registers
JS	JUMP IF SIGN (NEGATIVE)	SF = 1
JNS	JUMP IF NOT SIGN (POSITIVE)	SF = 0
JP	Jump if PARITY EVEN	PF = 1
JNP	Jump if PARITY ODD	PF = 0
JO	JUMP IF OVERFLOW	OF = 1
JNO	JUMP IF NO OVERFLOW	OF = 0

JMP ON CONDITION OF UNSIGNED ARITHMETIC

Mnemonic	Description	Flags/Registers
JA	Jump if above $op1 > op2$	CF = 0 and ZF = 0
JNBE	Jump if not below or equal $op1 \text{ not } \leq op2$	CF = 0 and ZF = 0
JAЕ	Jump if above or equal $op1 \geq op2$	CF = 0
JNB	Jump if not below $op1 \text{ not } < op2$	CF = 0
JB	Jump if below $op1 < op2$	CF = 1
JNAЕ	Jump if not above nor equal $op1 < op2$	CF = 1
JBE	Jump if below or equal $op1 \leq op2$	CF = 1 or ZF = 1
JNA	Jump if not above $op1 \leq op2$	CF = 1 or ZF = 1



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Lecture Contents	Lecture sequences:	Second lecture	Instructor Name: Dr. Mohammed Younis																										
	<p>The major contents:</p> <p>1-CONTROL INSTRUCTIONS</p> <p>2-Signed Arithmetic</p> <p>3 -Call Procedure</p> <p>4- Loop Instructions</p> <p>SEE MY YOUTUBE CHANNEL FROM</p> <p>https://www.youtube.com/watch?v=UYcTs92MJZg&t=2135s</p>																												
	<p>The detailed contents:</p> <p>JMP ON CONDITION OF SIGNED ARITHMETIC</p> <table><tr><th>Mnemonic</th><th>Description</th><th>Flags/Registers</th></tr><tr><td>JG</td><td>Jump if GREATER op1>op2</td><td>SF = OF AND ZF = 0</td></tr><tr><td>JNLE</td><td>Jump if not LESS THAN or equal op1>op2</td><td>SF = OF AND ZF = 0</td></tr><tr><td>JGE</td><td>Jump if GREATER THAN or equal op1>=op2</td><td>SF = OF</td></tr><tr><td>JNL</td><td>Jump if not LESS THAN op1>=op2</td><td>SF = OF</td></tr><tr><td>JL</td><td>Jump if LESS THAN op1<op2</td><td>SF <> OF</td></tr><tr><td>JNGE</td><td>Jump if not GREATER THAN nor equal op1<op2</td><td>SF <> OF</td></tr><tr><td>JLE</td><td>Jump if LESS THAN or equal op1 <= op2</td><td>ZF = 1 OR SF <> OF</td></tr><tr><td>JNG</td><td>Jump if NOT GREATER THAN op1 <= op2</td><td>ZF = 1 OR SF <> OF</td></tr></table>			Mnemonic	Description	Flags/Registers	JG	Jump if GREATER op1>op2	SF = OF AND ZF = 0	JNLE	Jump if not LESS THAN or equal op1>op2	SF = OF AND ZF = 0	JGE	Jump if GREATER THAN or equal op1>=op2	SF = OF	JNL	Jump if not LESS THAN op1>=op2	SF = OF	JL	Jump if LESS THAN op1<op2	SF <> OF	JNGE	Jump if not GREATER THAN nor equal op1<op2	SF <> OF	JLE	Jump if LESS THAN or equal op1 <= op2	ZF = 1 OR SF <> OF	JNG	Jump if NOT GREATER THAN op1 <= op2
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INST.	OPERANDS	FUNCTION
LOOP	LABLE	DEC CX THEN JUMP TO LABLE IF CX<>ZERO
LOOPNE LOOPNZ		DEC CX THEN JUMP TO LABLE IF CX<>ZERO AND ZF=0
LOOPE LOOPZ		DEC CX THEN JUMP TO LABLE IF CX<>ZERO AND ZF=1

INST.	OPERANDS	FUNCTION
JMP	LABLE	JUMP TO LABLE
CALL		CALL SUBROUTINE STARTED AT IP=LABLE TOS-2=IP FOR THE NEXT INSTRUCTION
RET	NO OPERAND	IP=TOS IP WILL POINTS TO THE INSTRUCTION NEXT TO CALL

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