PC': incremented PC. setcc(): set condition codes N, Z, and P. mem[A]:memory contents at address A. SEXT(immediate): sign-extend immediate to 16 bits. ZEXT(immediate): zero-extend immediate to 16 bits. Page 2 has an ASCII character table.

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 +---+--+ ADD DR, SR1, SR2 ; Addition ---+ ---+---+ ---+---+------+---+---+---+ ADD DR, SR1, imm5 ; Addition with Immediate 0 0 0 1 DR SR1 1 imm5 ---+---+ DR \leftarrow SR1 + SEXT(imm5) also setcc() -+---+ AND DR, SR1, SR2 ; Bit-wise AND 0 1 0 1 | DR | SR1 | 0 | 0 0 | SR2 | +---+--+--+ DR ← SR1 AND SR2 also setcc() -+---+---+ AND DR, SR1, imm5 ; Bit-wise AND with Immediate |0 1 0 1 | DR | SR1 |1 | imm5 +---+--+ DR 🗲 SR1 AND SEXT(imm5) also setcc() --+--+ BRx, label (where x = {n,z,p,zp,np,nz,nzp}) ; Branch | 0 0 0 0 | n | z | p | PCoffset9 | GO ← ((n and N) OR (z AND Z) OR (p AND P)) ---+--+ JMP BaseR ; Jump 1 1 0 0 0 0 0 0 BaseR 0 0 0 0 0 0 -+---+ JSR label ; Jump to Subroutine 0 1 0 0 0 1 PCoffset11 +---+--+ R7 ← PC', PC ← PC' + SEXT(PCoffset11) 0 1 0 0 0 0 BaseR 0 0 0 0 0 0 |0 0 1 0 | DR | PCoffset9 +---+- DR ← mem[PC' + SEXT(PCoffset9)] also setcc() ---+---+ LDI DR, label ; Load Indirect 1 0 1 0 | DR | PCoffset9 ----- DR 🗲 mem[mem[PC' + SEXT(PCoffset9)]] also setcc() --+--+ LDR DR, BaseR, offset6 ; Load Base+Offset 0 1 1 0 DR BaseR offset6 ++--++ DR 🗲 mem[BaseR + SEXT(offset6)] also setcc() --+--+ LEA, DR, label ; Load Effective Address | 1 1 1 0 | DR | PCoffset9 ____ -+---+ DR + PC' + SEXT(PCoffset9) also setcc() ---+--+----+---+ NOT DR, SR ; Bit-wise Complement | 1 0 0 1 | DR | SR | 1 | 1 1 1 1 1 | +---+--+ DR + NOT(SR) also setcc() -+--+--+--+ RET ; Return from Subroutine --+--+--+ RTI ; Return from Interrupt --+--+--+--+ ST SR, label ; Store PC-Relative |0 0 1 1 | SR | PCoffset9 ----+---+ mem[PC' + SEXT(PCoffset9)] 🗲 SR --+--+ STI, SR, label ; Store Indirect |1 0 1 1| SR | PCoffset9 ---+--+ mem[mem[PC' + SEXT(PCoffset9)]] - SR ---+ --+--+--+--+--+ STR SR, BaseR, offset6 ; Store Base+Offset 0 1 1 1 | SR | BaseR | offset6 --+--+ mem[BaseR + SEXT(offset6)] - SR --+--+--+ TRAP : System Call 1 1 1 1 0 0 0 0 | trapvect8 ---+--+--+--+--+--+--+--+--+--+--+ R7 ← PC', PC ← mem[ZEXT(trapvect8)] | 1 1 0 1 | ---+--+ Initiate illegal opcode exception 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

ASEII Table and Description

ASCII stands for American Standard Code for Information Interchange. Computers can only understand numbers, so an ASCII code is the numerical representation of a character such as 'a' or '@' or an action of some sort. ASCII was developed a long time ago and now the non-printing characters are rarely used for their original purpose. Below is the ASCII character table and this includes descriptions of the first 32 non-printing characters. ASCII was actually designed for use with teletypes and so the descriptions are somewhat obscure. If someone says they want your CV however in ASCII format, all this means is they want 'plain' text with no formatting such as tabs, bold or underscoring - the raw format that any computer can understand. This is usually so they can easily import the file into their own applications without issues. Notepad.exe

creates ASCII text, or in MS Word you can save a file as 'text only'

Dec HxOct Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html C	hr
0 0 000 NUL (null)	32	20	040	⊛# 32;	Space	64	40	100	¢#64;	0	96	60	140	& #96;	1
1 1 001 SOH (start of heading)	33	21	041	∉# 33;	1.00	65	41	101	A	A	97	61	141	 ∉#97;	a
2 2 002 STX (start of text)				 <i>‱#</i> 34;		66			B		98	62	142	& #98;	b
3 3 003 ETX (end of text)	35	23	043	 <i>∉</i> 35;	#	67	43	103	C	С	99	63	143	c	C
4 4 004 EOT (end of transmission)				 ∉36;		68			 4#68;					∝#100;	
5 5 005 <mark>ENQ</mark> (enquiry)				 ∉37;		69			 ∉#69;			_		e	
6 6 006 <mark>ACK</mark> (acknowledge)	1			 ∉38;		70			 ∉#70;				_	f	
7 7 007 <mark>BEL</mark> (bell)	1			 ∉39;		71			G					<i></i> %#103;	
8 8 010 <mark>BS</mark> (backspace)	1			 ‰#40;		72			H			_		«#104;	
9 9 011 TAB (horizontal tab)	1)		73			∉#73;					i	
10 A 012 LF (NL line feed, new line				6#42;					¢#74;					j	
ll B 013 VT (vertical tab)	1			«#43;		75	_		∝#75 ;					k	
12 C 014 FF (NP form feed, new page				¢#44;		76			& # 76;					l	
13 D 015 CR (carriage return)	1			a#45;		77	_		∝#77;					m	
14 E 016 <mark>SO</mark> (shift out)				.			_		 ∉78;					n	
15 F 017 <mark>SI</mark> (shift in)				6#47;		79			O					o	
16 10 020 DLE (data link escape)				«#48;		80			¢#80;					p	-
17 11 021 DC1 (device control 1)		_		«#49;					Q					q	-
18 12 022 DC2 (device control 2)				«#50;					R					«#114;	
19 13 023 DC3 (device control 3)				«#51;					¢#83;					s	
20 14 024 DC4 (device control 4)				& # 52;					¢#84;			• -		t	
21 15 025 NAK (negative acknowledge)				& # 53;					<i>4#</i> 85;					u	
22 16 026 SYN (synchronous idle)				«#54;					¢#86;					v	
23 17 027 ETB (end of trans. block)				«#55;		87			<i>4#87;</i>					w	
24 18 030 CAN (cancel)				«#56;		88			¢#88;					x	
25 19 031 EM (end of medium)	1			«#57;		89			¢#89;					y	_
26 1A 032 <mark>SUB</mark> (substitute)				«#58;		90			¢#90;					z	
27 1B 033 ESC (escape)	1			«#59;		91			["00					{	
28 1C 034 FS (file separator)			- · -	«#60;		92			& # 92;						
29 1D 035 GS (group separator)				= "CO		93			∉#93;					}	
30 1E 036 RS (record separator)				≪#62;					«#94;					~	
31 1F 037 <mark>US</mark> (unit separator)	63	ЗF	077	∝#63;	2	95	5F	137	∝#95;	-	127	7F	177		DEL

Source: www.LookupTables.com

Dec: decimal (base 10). Hx: hexadecimal (base 16). Oct: Octal (base 8). Html: not needed for CS/ECE 252. Char/Chr: ASCII character.

Example: ASCII character '9' is 00111001 (binary), 57 (decimal), and 39 (hexadecimal).