

---

# APPENDIX E

---

## AVR PRIMER FOR 8051 PROGRAMMERS

	AVR	8051
8-bit registers:	32 general-purpose registers (R0 to R31)	A, B, R0, R1, R2, R3, R4, R5, R6, R7
16-bit (data pointer):	X, Y, Z	DPTR
Program Counter:	PC (up to 22-bit)	PC (16-bit)
Input:	IN Rn, PINx (Use R0, R1, ..., R31.)	MOV A, Pn ; (n = 0 - 3)
Output:	OUT PORTx, Rn	MOV Pn, A ; (n = 0 - 3)
Loop:	DEC Rn BRNE TARGET	DJNZ R3, TARGET (Using R0-R7)
Stack pointer:	SP (16-bit) As we PUSH data onto the stack, it decrements the SP.  As we POP data from the stack, it increments the SP.	SP (8-bit) As we PUSH data onto the stack, it increments the SP.  As we POP data from the stack, it decrements the SP.
Data movement:		
From the code segment:	LPM Rn, Z (Use Z only.)	MOVC A, @A+PC
From RAM using indirect addressing:	LD Rn, X (Use X, Y, or Z.)	MOV A, @R0 (Use R0 or R1 only.)
From RAM using direct addressing:	LDS Rn, k	MOV A, RAM_addr
To RAM using indirect addressing mode:	ST X, Rn (Use X, Y, or Z.)	MOV @R0, A
To RAM using direct addressing mode:	STS k, X (Use X, Y, or Z.)	MOV RAM_addr, A