6502 Instructions

Name and Description	Addressing Modes	Op-Codes	Status N Z C I D V
ADC Add memory to accumulator with carry	ADC #Imm ADC ZP ADC ZP,X ADC Abs ADC Abs,X ADC Abs,Y ADC (ZP,X) ADC (ZP),Y	69 _ 65 _ 75 _ 6D _ _ 7D _ _ 79 _ _ 61 _ 71 _	• • • _ _ •
AND "AND" memory with accumulator	AND #Imm AND ZP AND ZP,X AND Abs AND Abs,X AND Abs,Y AND (ZP,X) AND (ZP),Y	29 _ 25 _ 35 _ 2D _ _ 3D _ _ 39 _ _ 21 _ 31 _	• • _ _ _ _
ASL Shift left one bit (Memory or Accumulator)	ASL A ASL ZP ASL ZP,X ASL Abs ASL Abs,X	0A 06 _ 16 _ 0E _ _ 1E _ _	• • • _ _ _
BCC Branch on carry clear	BCC Rel	90 _	_ _ _ _ _ _
BCS Branch on carry set	BCS Rel	B0 _	_ _ _ _ _ _
BEQ Branch on result zero	BEQ Rel	F0 _	_ _ _ _ _ _
BIT Test bits in memory with accumulator	BIT ZP BIT Abs	24 _ 2C _ _	• • _ _ _ •
BMI Branch on result minus	BMI Rel	30 _	_ _ _ _ _ _
BNE Branch on result not zero	BNE Rel	D0 _	_ _ _ _ _ _
BPL Branch on result plus	BPL Rel	10 _	_ _ _ _ _ _
BRK Force break	BRK	00	_ _ _ 1 _ _
BVC Branch on overflow clear	BVC Rel	50 _	_ _ _ _ _ _
BVS Branch on overflow set	BVS Rel	70 _	_ _ _ _ _ _
CLC Clear carry flag	CLC	18	_ _ 0 _ _ _
CLD Clear decimal mode	CLD	D8	_ _ _ _ 0 _
CLI Clear interrupt disable status	CLI	58	_ _ _ 0 _ _
CLV Clear overflow flag	CLV	B8	_ _ _ _ _ 0

CMP Compare memory and accumulator	CMP #Imm
	CMP ZP
	CMP ZP,X
	CMP Abs
	CMP Abs,X
	CMP Abs,Y
	CMP (ZP,X)
	CMP (ZP),Y
		C9 _
		C5 _
		D5 _
		CD _ _
		DD _ _
		D9 _ _
		C1 _
		D1 _
			• • • _ _ _

CPX Compare memory and index X	CPX #Imm CPX ZP CPX Abs	E0 _ E4 _ EC _ _	• • • _ _ _
CPY Compare memory and index Y	CPY #Imm CPY ZP CPY Abs	C0 _ C4 _ CC _ _	• • • _ _ _
DEC Decrement memory by one	DEC ZP DEC ZP,X DEC Abs DEC Abs,X	C6 _ D6 _ CE _ _ DE _ _	• • _ _ _ _
DEX Decrement index X by one	DEX	CA	• • _ _ _ _
DEY Decrement index Y by one	DEY	88	• • _ _ _ _
EOR "Exclusive-Or" memory with accumulator	EOR #Imm EOR ZP EOR ZP,X EOR Abs EOR Abs,X EOR Abs,Y EOR (ZP,X) EOR (ZP),Y	49 _ 45 _ 55 _ 4D _ _ 5D _ _ 59 _ _ 41 _ 51 _	• • _ _ _ _

Name and Description	Addressing Modes	Op-Codes	Status N Z C I D V
INC Increment memory by one	INC ZP INC ZP,X INC Abs INC Abs,X	E6 _ F6 _ EE _ _ FE _ _	• • _ _ _ _
INX Increment index X by one	INX	E8	• • _ _ _ _
INY Increment index Y by one	INY	C8	• • _ _ _ _
JMP Jump to new location	JMP Abs JMP (Abs)	4C _ _ 6C _ _	_ _ _ _ _ _
JSR Jump to new location saving return address	JSR Abs	20 _ _	_ _ _ _ _ _

LDA Load accumulator with memory	LDA #Imm
	LDA ZP
	LDA ZP,X
	LDA Abs
	LDA Abs,X
	LDA Abs,Y
	LDA (ZP,X)
	LDA (ZP),Y
		A9 _
		A5 _
		B5 _
		AD _ _
		BD _ _
		B9 _ _
		A1 _
		B1 _
			• • _ _ _ _

LDX Load index X with memory	LDX #Imm
	LDX ZP
	LDX ZP,Y
	LDX Abs
	LDX Abs,Y
		A2 _
		A6 _
		B6 _
		AE _ _
		BE _ _
			• • _ _ _ _

LDY Load index Y with memory	LDY #Imm
	LDY ZP
	LDY ZP,X
	LDY Abs
	LDY Abs,X
		A0 _
		A4 _
		B4 _
		AC _ _
		BC _ _
			• • _ _ _ _

LSR Shift right one bit (memory or accumulator)	LSR A LSR ZP LSR ZP,X LSR Abs LSR Abs,X	4A 46 _ 56 _ 4E _ _ 5E _ _	0 • • _ _ _

APPLE ZERO-PAGE USAGE

Dec:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex:	$0	$1	$2	$3	$4	$5	$6	$7	$8	$9	$A	$B	$C	$D	$E	$F
0 $00	AM	AM	A	A	A	A	O	O	O	A	A	A	A	A	A	A
16 $10	A	A	A	A	A	A	A	A	A	A	A	A	A	A	O	m*
32 $20	M	M	M	M	M	M	M	DM	DM	DM	M	M	DM	DM	A	A
48 $30	M	M	M	M	DM	M	M	M	M	M	M	M	DM	DM	M	M
64 $40	DM	DM	DM	DM	DM	DM	DM	D	D	D	D	M	M	M	D	A
80 $50	Am	Am	Am	Am	Am	A	A	A	A	A	A	A	A	A	A	A
96 $60	A	A	A	A	A	A	AD	A	AD	AD	A	A	A	A	A	AD
112 $70	AD	A	A	AD	A	A	A	A	A	A	A	A	A	A	A	A
128 $80	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
144 $90	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	AD
160 $A0	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
176 $B0	AD	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
192 $C0	A	A	A	A	A	A	A	A	A	A	AD	AD	AD	O	A	A
208 $D0	A	A	A	A	A	AD	A	AD	AD	A	A	O	A	X	A	X
224 $E0	A	A	A	O	A	A	A	A	A	O	O	O	A	A	A	A
240 $F0	A	A	A	A	A	A	A	A	O	O	O	A	O	A	A	X

A: APPLESOFT M: MONITOR
D: DOS M*: IIe MONITOR ONLY
O : UNUSED m: OLD MONITOR ROM ONLY

Name and Description	Addressing Modes	Op-Codes	Status N Z C I D V
NOP No operation	NOP	EA	_ _ _ _ _ _
ORA "OR" memory with accumulator	ORA #Imm ORA ZP ORA ZP,X ORA Abs ORA Abs,X ORA Abs,Y ORA (ZP,X) ORA (ZP),Y	09 _ 05 _ 15 _ 0D _ _ 1D _ _ 19 _ _ 01 _ 11 _	• • _ _ _ _
PHA Push accumulator on stack	PHA	48	_ _ _ _ _ _
PHP Push processor status on stack	PHP	08	_ _ _ _ _ _
PLA Pull accumulator from stack	PLA	68	• • _ _ _ _
PLP Pull processor status from stack	PLP	28	• • • • • •
ROL Rotate one bit left (memory or accumulator)	ROL A ROL ZP ROL ZP,X ROL Abs ROL Abs,X	2A 26 _ 36 _ 2E _ _ 3E _ _	• • • _ _ _
ROR Rotate one bit right (memory or accumulator)	ROR A ROR ZP ROR ZP,X ROR Abs ROR Abs,X	6A 66 _ 76 _ 6E _ _ 7E _ _	• • • _ _ _
RTI Return from interrupt	RTI	40	• • • • • •
RTS Return from subroutine	RTS	60	_ _ _ _ _ _
SBC Subtract memory from accumulator with borrow	SBC #Imm SBC ZP SBC ZP,X SBC Abs SBC Abs,X SBC Abs,Y SBC (ZP,X) SBC (ZP),Y	E9 _ E5 _ F5 _ ED _ _ FD _ _ F9 _ _ E1 _ F1 _	• • • _ _ •
SEC Set carry flag	SEC	38	_ _ 1 _ _ _
SED Set decimal mode	SED	F8	_ _ _ _ 1 _
SEI Set interrupt disable status	SEI	78	_ _ _ 1 _ _
STA Store accumulator in memory	STA ZP STA ZP,X STA Abs STA Abs,X STA Abs,Y STA (ZP,X) STA (ZP),Y	85 _ 95 _ 8D _ _ 9D _ _ 99 _ _ 81 _ 91 _	_ _ _ _ _ _
STX Store index X in memory	STX ZP STX ZP,Y STX Abs	86 _ 96 _ 8E _ _	_ _ _ _ _ _
STY Store index Y in memory	STY ZP STY ZP,X STY Abs	84 _ 94 _ 8C _ _	_ _ _ _ _ _
TAX Transfer accumulator to index X	TAX	AA	• • _ _ _ _
TAY Transfer accumulator to index Y	TAY	A8	• • _ _ _ _
TSX Transfer stack pointer to index X	TSX	BA	• • _ _ _ _
TXA Transfer index X to accumulator	TXA	8A	• • _ _ _ _
TXS Transfer index X to stack pointer	TXS	9A	_ _ _ _ _ _
TYA Transfer index Y to accumulator	TYA	98	• • _ _ _ _