

ARM Instructions Practice Problems

CDA 3101

What is the ARM assembly language instruction that corresponds to the following machine code:

0xCA0A012A

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0xCA0A012A

1100 1010 0000 1010 0000 0001 0010 1010

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0xCA0A012A

110010100000 1010 0000 0001 0010 1010

STXR	D	11	11001000000	
LDXR	D	11	11001000010	
EOR	R	11	11001010000	
SUB	R	11	11001011000	
SUBI	I	10	1101000100	(
EORI	I	10	1101001000	(
MOVZ	IM	9	110100101	(
LSR	R	11	11010011010	

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11001010000 0 1010 0000 0001 0010 1010

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EORI	I	10	1101001000	(
MOVZ	IM	9	110100101	(
LSR	R	11	11010011010	

What is the ARM assembly language instruction that corresponds to the following machine code:

0xCA0A012A

11001010000 01010 000000 01001 01010

CORE INSTRUCTION FORMATS

R	opcode	Rm	shamt	Rn	Rd
	31 21 20	16 15	10 9	5 4	0
I	opcode	ALU immediate		Rn	Rd
	31 22 21			10 9	5 4 0
D	opcode	DT address	op	Rn	Rt
	31 21 20	12 11 10 9		5 4	0
B	opcode	BR address			
	31 26 25				
CB	Opcode	COND BR address			Rt
	31 24 23				5 4 0
IW	opcode	MOV immediate			Rd
	31 21 20				5 4 0

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LDR	D	11	11001000010	
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SUB	R	11	11001011000	
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	I	10	1101001000	
	IM	9	110100101	
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	31 24 23	5 4			0
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Rm = 01010 = X10

Rn = 01001 = X9

Rd = 01010 = X10

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EOR X10, X9, X10

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	31 21 20	16 15	10 9	5 4	0
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Rm = 01010 = X10

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Convert the following assembly language instruction to machine code:

ADDI X13, X14, #100

1	ADD Immediate	ADDI	I	488-489	$R[Rd] = R[Rn] + ALUImm$	(2,9)
1	ADD Immediate & Set flags	ADDIS	I	588-589	$R[Rd], FLAGS = R[Rn] + ALUImm$	(1,2,9)

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Inst	Op	OpC	Inst	Op	OpC
ADDI	I	10	1001000100	488	489
ANDI	I	10	1001001000	490	491

CORE INSTRUCTION FORMATS

R	opcode	Rm	shamt	Rn	Rd
	31	21 20	16 15	10 9	5 4 0
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Convert the following assembly language instruction to machine code:

ADDI X13, X14, #100

1001000100 000001100100 01110 01101

OpCode	OpType	OpImm	OpImmHex	OpImmDec	OpImmHex
ADDI	I	10	1001000100	488	489
ANDI	I	10	1001001000	490	491

CORE INSTRUCTION FORMATS

R	opcode	Rm	shamt	Rn	Rd
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ADDI X13, X14, #100

1001000100 000001100100 01110 01101

1001 0001 0000 0001 1001 0001 1100 1101

0x910191CD