

128 1000 0000  
0111 1111

Oct 4 '22

$RO < RI$

a. CMP RO, RI  
MOVL T RO, RI

$(RO < RI)$

$RO ? RI$

b. CMP RO, RI  
MOVLO RO, RI

$(RO < RI)$

<u>S</u>	<u>U</u>
GT	HI
GE	HS
LT	LO
LE	LS

c. } CMP RO, RI  
d. } MOV RO, #0  
\*MOVL T RO, RI

$(RO < RI)$

e. CMP RI, #0  
BLT - shift-right  
MOV RO, RO LSL RI  
BX LR

$RI < \neq 0$

shift-right

NEG RI, RI  
MOV RO, RO LSR RI  
BX LR

f. TST RO, RI  
MOV RO, #0  
MOVNE RO, #1

g. TST RO, #3  
MOV RO, #0  
MOVEQ RO, #1

h. CMP RO, RI  
MOV RO, #0  
MOVEQ RO, #1

R3 = 0x00000001

R2 = 0x00000002

R0 = 0x34000000

R1 = 0xCD1258EF

a. STR R1, [R0] l.e. 0x34000000 0xEF

1 0x58

2 0x12

3 0xCD

b. STRH R1, [R0] l.e. 0x34000000 0xEF  
0xCD12 58 EF

1 0x58

2 X

3 X

c. STRB R1, [R0] l.e. 0x34000000 0xEF  
0xCD1258 EF

1 X

2 X

3 X

d. STR R1, [R0] B.E. 0x34000000 0xCD

1 0x12

2 0x58

3 0xEF

e. STRH R1, [R0] B.E.  
0xCD12 58 EF

0x34000000 0x58

1 0xEF

2 X

3 X

f. STRB R1, [R0]  
0xCD1258 EF

0x34000000 0xEF

1 X

2 X

3 X

g.  $\text{STRB } R1, [R0, R3]$  <sup>B.E.</sup>  $0x34000000$  X  
 1  $0xEF$   
 2 X  
 3 X

h.  $\text{STRH } R1, [R0, R2]$  <sup>B.E.</sup>  $0x34000000$  X  
 1 X  
 2  $0x58$   
 3  $0xEF$

3 a.  $\text{LDR } R0, [R1]$  <sup>B.E.</sup>  
 $0x2358328B$

b.  $\text{LDRH } R0, [R1, R2]$   
 $0x0000328B$

c.  $\text{LDRSH } R0, [R1]$   
 $0xFF FF 9A CD$

d.  $\text{LDRB } R0, [R1]$   
 $0x000000CD$

e.  $\text{LDRSB } R0, [R1]$   
 $0xFF FF FF DE$

f.  $\text{LDRSB } R0, [R1, R2]$   
 $0xFF FF FF 8B$

R0 = C000 0002  
R1 = 8754 CA B3  
R2 = C000 0004

STRH R1, [R0]  
STR R2, [R2]

20	_____	N/A
1	_____	N/A
2	_____	0x CA
3	_____	0x B3
4	_____	0x C0
5	_____	0x 00
6	_____	0x 00
7	_____	0x 04

hello

'h' 'e' 'l' 'l' 'o' \0

[ ]

0xc000 0000 'h'

01 'e'

02 'l'

3 'l'

4 'o'

s[] = 'h', 'e', 'l', 'l', 'o', \0

extern uint8\_t lengthString (s[])

.global lengthString

.text

lengthString:

MOV R1, R0

MOV R0, #0

loop-1:

LDRSB R2, [R1]

ADD R1, R1, #1

CMP R2, #0

ADDNE R0, R0, #1

BNE loop-1

BX LR

PUSH {R4}

{R4-R9}  
{R4, R5, R6, R8}

...

POP {R4}

load chars'

compare

NE = 0

EQ = 1

R0 = Addr String 1

R1 = Addr String 2

R2 = char\_1

R3 = char\_2

# Floating Point

1.5

$1 \frac{1}{2}$

$1 + 2^{-1}$

$2^{-4}$

$2^5 \quad 2^2 \quad 2^1 \quad 2^0 \quad 2^{-1} \quad 2^{-2} \quad 2^{-3} \quad 2^{-4}$

$5 \frac{1}{16} \quad 16^{-1} \quad \frac{1}{16} \quad \frac{1}{24}$

$\frac{1}{5} \quad 5^{-1}$

1.1

101.0001

$$\begin{array}{r}
 .200 \\
 .125 \\
 \hline
 .075 \\
 .0625 \\
 \hline
 .0145
 \end{array}$$

$$\begin{array}{r|l}
 .2 & \\
 \hline
 0 & 2^{-1} \\
 0 & 2^{-2} \\
 1 & 2^{-3} \\
 \hline
 &
 \end{array}$$

$1 \times 10^6 = 1000000$

101.0001

1000 0000 - 1

01 010001  $\times 2^2$

128 - 1

127

↑  
assumed!

$$0.0625 = 1/16$$

0.0001

$$1.0000 \dots \times 2^{-4}$$

$$.0000 \dots \times 2^{-4}$$

$$\begin{array}{r} 127 \\ + - 4 \\ \hline 123 \end{array}$$



$0.5 + .0625 = 0.5625$   
 $0.5625 \times 2^3 = 4.5$   
 $4.5 \times 2^3 = 36$   
 $36 \times 2^3 = 288$   
 $288 \times 2^3 = 2304$   
 $2304 \times 2^3 = 18432$   
 $18432 \times 2^3 = 147456$   
 $147456 \times 2^3 = 1179648$   
 $1179648 \times 2^3 = 9437184$   
 $9437184 \times 2^3 = 75497472$   
 $75497472 \times 2^3 = 603979776$   
 $603979776 \times 2^3 = 4831838208$   
 $4831838208 \times 2^3 = 38654705664$   
 $38654705664 \times 2^3 = 309237645312$   
 $309237645312 \times 2^3 = 2473901162496$   
 $2473901162496 \times 2^3 = 19791209300000$   
 $19791209300000 \times 2^3 = 158329674400000$   
 $158329674400000 \times 2^3 = 1266637395200000$   
 $1266637395200000 \times 2^3 = 10133100000000000$   
 $10133100000000000 \times 2^3 = 81064800000000000$   
 $81064800000000000 \times 2^3 = 648518400000000000$   
 $648518400000000000 \times 2^3 = 5188147200000000000$   
 $5188147200000000000 \times 2^3 = 41505177600000000000$   
 $41505177600000000000 \times 2^3 = 332041420800000000000$   
 $332041420800000000000 \times 2^3 = 2656331366400000000000$   
 $2656331366400000000000 \times 2^3 = 21250650931200000000000$   
 $21250650931200000000000 \times 2^3 = 170005207449600000000000$   
 $170005207449600000000000 \times 2^3 = 1360041659596800000000000$   
 $1360041659596800000000000 \times 2^3 = 10880333276774400000000000$   
 $10880333276774400000000000 \times 2^3 = 87042666214195200000000000$   
 $87042666214195200000000000 \times 2^3 = 696341329713561600000000000$   
 $696341329713561600000000000 \times 2^3 = 5570730637708492800000000000$   
 $5570730637708492800000000000 \times 2^3 = 44565845101667942400000000000$   
 $44565845101667942400000000000 \times 2^3 = 356526760813343539200000000000$   
 $356526760813343539200000000000 \times 2^3 = 2852214086506748313600000000000$   
 $2852214086506748313600000000000 \times 2^3 = 22817712692053986508800000000000$   
 $22817712692053986508800000000000 \times 2^3 = 182541701536431892070400000000000$   
 $182541701536431892070400000000000 \times 2^3 = 1460333612291455136563200000000000$   
 $1460333612291455136563200000000000 \times 2^3 = 11682668906331641092505600000000000$   
 $11682668906331641092505600000000000 \times 2^3 = 93461351250653128740044800000000000$   
 $93461351250653128740044800000000000 \times 2^3 = 747690810005225030720358400000000000$   
 $747690810005225030720358400000000000 \times 2^3 = 5981526480041800245762867200000000000$   
 $5981526480041800245762867200000000000 \times 2^3 = 47852211840334401966102937600000000000$   
 $47852211840334401966102937600000000000 \times 2^3 = 382817694722675215728823500800000000000$   
 $382817694722675215728823500800000000000 \times 2^3 = 3062541557781401725830588006400000000000$   
 $3062541557781401725830588006400000000000 \times 2^3 = 24500332462251213806644704051200000000000$   
 $24500332462251213806644704051200000000000 \times 2^3 = 196002659706009710453157632409600000000000$   
 $196002659706009710453157632409600000000000 \times 2^3 = 1568021277648077683625261059276800000000000$   
 $1568021277648077683625261059276800000000000 \times 2^3 = 12544170221184621469002088474214400000000000$   
 $12544170221184621469002088474214400000000000 \times 2^3 = 100353361769477071752016707793715200000000000$   
 $100353361769477071752016707793715200000000000 \times 2^3 = 802826902155816574016133662349721600000000000$   
 $802826902155816574016133662349721600000000000 \times 2^3 = 6422615217246532592129069306797772800000000000$   
 $6422615217246532592129069306797772800000000000 \times 2^3 = 51380921737972260737032554454382182400000000000$   
 $51380921737972260737032554454382182400000000000 \times 2^3 = 411047373903778085896260435635057463040000000000$   
 $411047373903778085896260435635057463040000000000 \times 2^3 = 3288379071230224687170083485080459704320000000000$   
 $3288379071230224687170083485080459704320000000000 \times 2^3 = 26307032569841797505360667880643677634560000000000$   
 $26307032569841797505360667880643677634560000000000 \times 2^3 = 210456260558734380042885343045149421076480000000000$   
 $210456260558734380042885343045149421076480000000000 \times 2^3 = 1683650084469875040343082744361195368611840000000000$   
 $1683650084469875040343082744361195368611840000000000 \times 2^3 = 13469200675759000322744661954889562948894720000000000$   
 $13469200675759000322744661954889562948894720000000000 \times 2^3 = 107753605406072002581957295639116503591157760000000000$   
 $107753605406072002581957295639116503591157760000000000 \times 2^3 = 862028843248576020655658365112932028729262080000000000$   
 $862028843248576020655658365112932028729262080000000000 \times 2^3 = 6900230745988608165245266920903456230034176640000000000$   
 $6900230745988608165245266920903456230034176640000000000 \times 2^3 = 55201845967908865321962135367227650640273413120000000000$   
 $55201845967908865321962135367227650640273413120000000000 \times 2^3 = 441614767743270922575697082937821205122187304960000000000$   
 $441614767743270922575697082937821205122187304960000000000 \times 2^3 = 3532918141946167380605576663502569640977500439680000000000$   
 $3532918141946167380605576663502569640977500439680000000000 \times 2^3 = 28263345135569339044844613308020557127820003517440000000000$   
 $28263345135569339044844613308020557127820003517440000000000 \times 2^3 = 226106761084554712358756906464164457022560028139520000000000$   
 $226106761084554712358756906464164457022560028139520000000000 \times 2^3 = 1808854088676437698870055251713315656180480225116160000000000$   
 $1808854088676437698870055251713315656180480225116160000000000 \times 2^3 = 14470832709411501590960442013706525250243841800929280000000000$   
 $14470832709411501590960442013706525250243841800929280000000000 \times 2^3 = 115766661675292012727683536109652202001950734407434240000000000$   
 $115766661675292012727683536109652202001950734407434240000000000 \times 2^3 = 926133293402336101821468288877217616015605875259473920000000000$   
 $926133293402336101821468288877217616015605875259473920000000000 \times 2^3 = 7409066347218688814571746311017740928124847002075791360000000000$   
 $7409066347218688814571746311017740928124847002075791360000000000 \times 2^3 = 59272530777749510516573970488141927425006776016606330880000000000$   
 $59272530777749510516573970488141927425006776016606330880000000000 \times 2^3 = 474180246221996084132591763905135419400054208132850647040000000000$   
 $474180246221996084132591763905135419400054208132850647040000000000 \times 2^3 = 3793441969775968673060734111241083355200433665062805176320000000000$   
 $3793441969775968673060734111241083355200433665062805176320000000000 \times 2^3 = 30347535758207749384485872889928666841603469320502441410560000000000$   
 $30347535758207749384485872889928666841603469320502441410560000000000 \times 2^3 = 242780286065661995075887063119429334732827754564019531284480000000000$   
 $242780286065661995075887063119429334732827754564019531284480000000000 \times 2^3 = 1942242288525295960607096504955434677862622036512156250275840000000000$   
 $1942242288525295960607096504955434677862622036512156250275840000000000 \times 2^3 = 15537938308202367684856772039643477422901776292097250002206720000000000$   
 $15537938308202367684856772039643477422901776292097250002206720000000000 \times 2^3 = 124303506465618941478854176317147819383214210336778000017653760000000000$   
 $124303506465618941478854176317147819383214210336778000017653760000000000 \times 2^3 = 994428051724951531830833410537182555065713682694224000014109440000000000$   
 $994428051724951531830833410537182555065713682694224000014109440000000000 \times 2^3 = 7955424413799612254646667284297460440525709461553792000011287520000000000$   
 $7955424413799612254646667284297460440525709461553792000011287520000000000 \times 2^3 = 63643395310396898037173338274379683524205675692430336000090300160000000000$   
 $63643395310396898037173338274379683524205675692430336000090300160000000000 \times 2^3 = 509147162483175184297386706195037468193645405539442688000722401280000000000$   
 $509147162483175184297386706195037468193645405539442688000722401280000000000 \times 2^3 = 4073177307865401474379093649560300745549163244315541504005779210240000000000$   
 $4073177307865401474379093649560300745549163244315541504005779210240000000000 \times 2^3 = 32585418462923211795032749196482405964393305954524332032046233681920000000000$   
 $32585418462923211795032749196482405964393305954524332032046233681920000000000 \times 2^3 = 260683347703385694360261993571859247715146447636194656256370669455360000000000$   
 $260683347703385694360261993571859247715146447636194656256370669455360000000000 \times 2^3 = 2085466781627085554882103948574873981721171581089557250050965355642880000000000$   
 $2085466781627085554882103948574873981721171581089557250050965355642880000000000 \times 2^3 = 16683734253016684439056831588598991853769372648716458000407722845143040000000000$   
 $16683734253016684439056831588598991853769372648716458000407722845143040000000000 \times 2^3 = 133470674024133475512454652708791934830154981189731664003261782761144320000000000$   
 $133470674024133475512454652708791934830154981189731664003261782761144320000000000 \times 2^3 = 1067765392193067804107637221670335478641239849517853312026094262089154560000000000$   
 $1067765392193067804107637221670335478641239849517853312026094262089154560000000000 \times 2^3 = 8542123137544542432861105773362683829129918796142826496208754096713236480000000000$   
 $8542123137544542432861105773362683829129918796142826496208754096713236480000000000 \times 2^3 = 68337065100356339462888846186901470633039350369142611969670032773705891840000000000$   
 $68337065100356339462888846186901470633039350369142611969670032773705891840000000000 \times 2^3 = 546696520802850715703110769495211765064314802953140895757360262189647134720000000000$   
 $546696520802850715703110769495211765064314802953140895757360262189647134720000000000 \times 2^3 = 4373572166422805725624886155961694120514518423625127166058882097517177077760000000000$   
 $4373572166422805725624886155961694120514518423625127166058882097517177077760000000000 \times 2^3 = 35068577331382445805079089247693552964116147389001017328471056780137416622080000000000$   
 $35068577331382445805079089247693552964116147389001017328471056780137416622080000000000 \times 2^3 = 280548618651059566440632713981548423712929179112008138627768454241107332976640000000000$   
 $280548618651059566440632713981548423712929179112008138627768454241107332976640000000000 \times 2^3 = 2244389029208476531525061711852387389703433432896065109022147633928858663813120000000000$   
 $2244389029208476531525061711852387389703433432896065109022147633928858663813120000000000 \times 2^3 = 17955112233667812252200493694819099117627467463168520872177181071430869310504960000000000$   
 $17955112233667812252200493694819099117627467463168520872177181071430869310504960000000000 \times 2^3 = 143640897869342498017603949558552792941019739705348166977417448571446954484039680000000000$   
 $143640897869342498017603949558552792941019739705348166977417448571446954484039680000000000 \times 2^3 = 1149127182954739984140831596468422343528157917642785335819339588571575635872317440000000000$   
 $1149127182954739984140831596468422343528157917642785335819339588571575635872317440000000000 \times 2^3 = 9193017463637919873126652771747378748225263341142282686554716708572605086978539520000000000$   
 $9193017463637919873126652771747378748225263341142282686554716708572605086978539520000000000 \times 2^3 = 73544139709103358985013222173979030785802106729138261492437733668580840695828316160000000000$   
 $73544139709103358985013222173979030785802106729138261492437733668580840695828316160000000000 \times 2^3 = 588353117672826871880105777391832246286416853833106091939501869348646725566626529280000000000$   
 $588353117672826871880105777391832246286416853833106091939501869348646725566626529280000000000 \times 2^3 = 4706825021382614975040846219134657970291334830664848735516014954789173804533012234240000000000$   
 $4706825021382614975040846219134657970291334830664848735516014954789173804533012234240000000000 \times 2^3 = 37654600171060919800326769753077263762330678645318789884128119638313390436264097873920000000000$   
 $37654600171060919800326769753077263762330678645318789884128119638313390436264097873920000000000 \times 2^3 = 301236801368487358402614158024618110106645429162550319073024957106507123490112782991360000000000$   
 $301236801368487358402614158024618110106645429162550319073024957106507123490112782991360000000000 \times 2^3 = 2410694410947898867220913264196944880853163433300402552584199656852056987920902263930880000000000$   
 $2410694410947898867220913264196944880853163433300402552584199656852056987920902263930880000000000 \times 2^$

typedef struct \_BUSINESS2

```

{
    uint32_t taxId;
    char name [27];
    char dir
    char Street [35]
    uint32_t addNo
    char city [30]
    char state [3]
    uint32_t zip
} BUSINESS2

```

0xFF00	taxId	taxId	taxId	taxId
04	name	.	.	.
08	.	.	.	.
0C	.	.	.	.
10	.	.	.	.
14	.	.	.	.
18	.	.	.	.
1C	name	.	name	dir
	Street	.	.	.
	.	.	.	.
	.	.	.	.
	.	.	.	.
	.	.	.	.
	.	.	.	.
	.	.	.	.
	.	.	Street	addNo
	addNo	addNo	addNo	

[illegible]

*D* *o*

D1

VMOV

VCMP