MITx 6.004.2x

Computation Structures 2: Computer Architecture

Help selfpoised

Course Progress Dates Discussion

Course / 11. Compilers / Lecture Videos (34:57)

‹ Previous ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ Next ›

LE11.1

Bookmark this page

Calculator

LE11.1.1 Expressions

0 points possible (ungraded)

Hand-compile the following C fragments into Beta assembly language. You can also assume that all variables and arrays are C integers, i.e., 32-bit values, and that the necessary storage allocation for each variable or array has been done and that a UASM label has been defined that indicates the first storage location for that variable or array.

There's no automated checking for this problem. Just write your answer out on a piece of paper and then compare it with the solutions to see how you did!

(A) `x = 3;`

(B) `d = b + 3*c;` [Note: in C, multiplication has a higher precedence than addition, so C treats this expression as "b+(3*c)".]

(C) `d = (b*3 + 1)/(c - b);`

(D) `a[1] = a[0] + 1;` [Note: in C, the first element of an array has index 0. Remember that each element of the "a" array occupies 4 bytes (i.e., bsize = 4).]

(E) `a[j-1] = a[j] + 1;`

Submit

LE11.1.2 Array access

1.0/1.0 point (ungraded)

What C statement might have been compiled into the code fragment below?

```
I = 0x5678
B = 0x1234

LD(I,R0)
SHLC(R0,2,R0)
LD(R0,B,R1)
MULC(R1,17,R1)
ST(R1,B,R0)
```

● $B[I] = B[I] * 17$

○ $B[I] = B[I * 17]$

○ $B[I] = B[4 * I] * 17$

○ $B[I] = B[4 * I * 17]$

✓

Submit

LE11.1.3 Array access

1.0/1.0 point (ungraded)

For each of the assembly language sequences below, click the associated box if it might have resulted from compiling the following C statement.

```
int x[20];
```

Calculator

```
    int x[20];
    int y;
    y = x[1] + 4;
```

□

```
A: LD(R31,x+1,R0)
   ADDC(R0,4,R0)
   ST(R0,y,R31)
```

□

```
B: CMOVE(4,R0)
   ADDC(R0,x+4,R0)
   ST(R0,y,R31)
```

□

```
C: LD(R31,x+4,R0)
   ST(R0,y+4,R31)
```

□

```
D: CMOVE(4,R0)
   LD(R0,x,R1)
   ST(R1,y,R0)
```

☑

```
E: LD(R31,x+4,R0)
   ADDC(R0,4,R0)
   ST(R0,y,R31)
```

□

```
F: ADDC(R31,x+1,R0)
   ADDC(R0,4,R0)
   ST(R0,y,R31)
```

✓

Submit

Discussion

Hide Discussion

Topic: 11. Compilers / LE11.1

Add a Post

Show all posts by recent activity

☑ MULC vs MUL

For Question 1 B&C, any reason why MULC is not used for 3*c and 3*b 3

‹ Previous Next ›

Calculator

edX

About
Affiliates
edX for Business
Open edX
Careers
News

Legal

Terms of Service & Honor Code
Privacy Policy
Accessibility Policy
Trademark Policy
Sitemap

Connect

Blog
Contact Us
Help Center
Media Kit
Donate

Calculator