

*TMS320 DSP
DESIGNER'S NOTEBOOK*

Bit-reversed Addressing in C on the 'C3x

APPLICATION BRIEF: SPRA204

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Bit-reversed Addressing in C on the 'C3x



Abstract

The C compiler does not support bit-reversed addressing. This document contains a code example showing how to embed assembly language statements into the C code to do this.



Design Problem

Suppose a C programmer wanted to take advantage of bit-reversed addressing. The C compiler does not support it. How does the programmer embed assembly language statements into the C code to do this?

Solution

An example of how to do this is shown in below.

Example 1. Embedded Assembly Language Example

```
#define N 16
int x[N] = { 0,8,4,12,2,10,6,14,1,9,5,13,3,11,7,15 };
int y[N] = { 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 };
/* int bitrev(int m, int n); */

void main()
{
    int i;
    asm(" PUSH AR5");
    asm(" PUSH AR0");
    asm(" LDI 8,IR0 ; initialize ir0 to 1/2 n");
    asm(" LDI @CONST+0,AR5 ;AR5<-address of x[] ");
    asm(" LDI @CONST+1,AR0 ;AR0<-address of y[] ");
    for ( i=0; i<N; i++ )
    {
        /* y[bitrev(i,N) ] = x[i]; */
        asm(" LDI *AR5++(IR0)b, R0");
        asm(" STI R0,*AR0++");
    }
    asm(" pop ar0");
    asm(" pop ar5");
}
/* These statements place x and y in .bss and make
   their addresses available via the CONST table. */
asm(" .bss    CONST,2 ");
asm(" .sect   \".cinit\" ");
asm(" .word   2,CONST ");
asm(" .word   _x ");
asm(" .word   _y ");
```