



## "unsigned >" comparison of 32bit integers failing ??

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### "unsigned >" comparison of 32bit integers failing ??



**7alken**  
New member

Posts: 5  
Joined: Sat Jun 17, 2023 2:26 am

by **7alken** » Sat Jun 17, 2023 2:46 am

Hi, please, say I have this code snippet from my experimental VMEX engine interpreting modified RISC-V (sw hex-menemo optimized opcodes, 16bit immediates, generally RV32EM asm-src compatible, but different encoding)

and I have tested on MANY compilers, 32/16/8 bit including cc65 this engine, as it has tests battery included. Everywhere is anything related to code below without modification okay, but for BOTH compilers from z88dk for z80/cpm/zxs I experienced issue with simple "unsigned >" comparison of dereferenced pointers - as I debugged test fail, I found that "unsigned >" does work well here below, so I reversed the operation to use "<" operator

( REGU\_TYPE is finally uint32\_t and types or \_rs1\_/\_rs2\_ are int32\_t\* )

BLTU - branch less than unsigned - okay

BGTU - branch greater than unsigned (z88dk code FAILs in case natural ">" is used)

CODE: SELECT ALL

```
case OPSBA_BLTU:
    if ((REGU_TYPE) *_rs1_ < (REGU_TYPE) *_rs2_) { core.pc += imm << LSHIFT; }
    break;

case OPSBB_BLEU: //pseudo
    if ((REGU_TYPE) *_rs1_ <= (REGU_TYPE) *_rs2_) { core.pc += imm << LSHIFT; }
    break;

case OPSBC_BGEU:
    if ((REGU_TYPE) *_rs1_ >= (REGU_TYPE) *_rs2_) { core.pc += imm << LSHIFT; }
    break;

case OPSBD_BGTU: //pseudo
    //HACK for z88dk z80 compiler - "unsigned >" FAILS !!!
```

As I told anywhere else is usage of ">" operator okay, but through z88dk I had this issue - may it be really bug or not ???

Petr



### Re: "unsigned >" comparison of 32bit integers failing ??

by **7alken** » Sat Jun 17, 2023 2:59 am

entire project is here:

<https://github.com/apws/230326-VMEX>

and I compiled it for z80/cpm on windows this way:

CODE: SELECT ALL

```
set PATH=%PATH%;c:\z88dk\bin\
ZCCCFG=c:\z88dk\lib\config
set SRC=..\..\src

gcc +cpm %SRC%\VMEX.c -I%SRC% -o VMEX.bin -create-app
```



### Re: "unsigned >" comparison of 32bit integers failing ??

by **7alken** » Sat Jun 17, 2023 4:05 am

I am trying to isolate this to minimal example for github bugreport.



**7alken**  
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### Re: "unsigned >" comparison of 32bit integers failing ??

by **7alken** » Sat Jun 17, 2023 4:41 am

Using minimal example, I can confirm that Z88DK, ONLY sccz80 compiler has bug in some optimizations around "unsigned >" comparison in such cases:

(code shows how expression assigned to result is okay, but expression evaluated inside if () is wrong)



**7alken**  
New member

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CODE: SELECT ALL

```
#include <stdio.h>

int main()
{
    signed short i = 0;

    signed long a = 0;
    signed long b = 0;

    i=0x1000; a = (signed long) i;
    i=0x9000; b = (signed long) i;

    printf("a=%ld b=%ld\n\n" a b);
```

teste compilation this way for CP/M (testsc.c) and ZX Spectrum, both compilers (testsc.c, testsc.c):

CODE: SELECT ALL

```
zcc +cpm main.c -o testsc.c -create-app
zcc +zx -v -startup=0 -clib=sdcc_iy -zorg=24800 main.c -o testsc.c -create-app
zcc +zx -v -clib=new -O3 -startup=1 main.c -I%SRC% -o testsc.c -create-app
```

## Re: "unsigned >" comparison of 32bit integers failing ??

by **7alken** » Sat Jun 17, 2023 5:05 am

reported as github issue



**7alken**

New member

Posts: 5

Joined: Sat Jun 17, 2023 2:26 am

## Re: "unsigned >" comparison of 32bit integers failing ??

by **dom** » Sat Jun 17, 2023 7:09 am

Thanks for the report - an interesting case not covered by the test cases and only on the z80 implementation (so 8080, 8085 and gbz80 were correct).

This should be fixed in the next nightly, so 20230618 onwards

It's an interesting project! It's always seem to be CPU emulators that show up problems. There's a m68k emulator in <https://gitlab.com/strandgames/braman/> ... [t\\_magnetic](#) that caused a bit of trouble a few years ago.



**dom**

Well known member

Posts: 1901

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