Subject: Re: Unsigned Integers - How?
Posted by Peter Berdeklis on Fri, 07 Feb 1997 08:00:00 GMT
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On Fri, 7 Feb 1997, David Fanning wrote:
> Peter Berdeklis <peter@atmosp.physics.utoronto.ca> writes:
>
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>> headers are several unsigned integers for dates and times. Some of the
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>> specify a variable as an unsinged integer in IDL?
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> Read the unsinged integers into *signed* 16-bit integers in IDL.
> (You are already doing this, apparently).
>
> date = 0L
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> Convert them to the correct *unsigned* values, like this:
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> date = LONG(date) AND 'FFFF'x
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Thank you for your response.

Unfortunately, I'm not reading 16-bit integers but 32-bit integers.
Sorry I forgot to mention that - too much time spent programming with
DJGPP (GNU C for DOS). So how would I pull the same trick with 32-bit
integers?

> Seeing the same question twice in the same week means it
> has to be tip material! I've put this answer on my web page
> for future reference.

In fact, it should be part of the IDL manuals. :)

Sorry for asking a question 2ce. I'm not a regular participant to the
newsgroup, just a desperate newbie.

By the way David, I just looked up your Web page. Thanks for the tips.
Since you worked at RSI, do you know why IDL doesn't have an unsigned data
type?

Peter Berdeklis

Subject: Re: Unsigned Integers - How?
Posted by davidf on Fri, 07 Feb 1997 08:00:00 GMT
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Folks,

I have the distinct feeling that it is Friday and a lot of us are not taking enough exercise and getting the ol' oxygen going to the brain.

Let me see if I can summerize this discussion without causing any more head scratching and muttering.

If you have unsigned 16-bit integers in a file, you first read them into *signed* 16-bit integers.

```
data = INTARR(100)
READU, lun, datafile, data
```

If the unsigned *value* is important to you, you will have to convert this data to LONG integers with a command like this:

```
data = LONG(data) AND 'FFFF'x
```

(Yes, those of you uncomfortable with hexadecimal numbers may use 65535L.)

If memory is important, you probably want to throw a TEMPORARY in there, like this:

```
data = LONG(TEMPORARY(data)) AND 'FFFF'x
```

If the unsigned *value* is not terribly important to you, but the *relative position of the value in relation to other values in the data* is important (e.g. maybe you want to display the data as an image and don't care what the *real* values are), then you can keep the data as 16-bit integers, but you have to, as they say, "twiddle" or change the top-most bit. This in effect means you subtract an "offset" of -32768 from each member of the data set.

The unsigned value 0 becomes the signed value -32768.
The unsigned value 32768 becomes the signed value 0.

The unsigned value 65535 becomes the signed value 32768.
And so forth.

According to a wonderful post by Struan Gray earlier (and explained to me in a private e-mail posting by Mitchell Grunes, to which I am very appreciative), this is most easily done by a command like this:

```
data = TEMPORARY(data)  XOR (-32768)
```

If you are going to use this 16-bit data set for some kind of real-world purpose, you will have to remember that the *real* values are offset by this -32768 amount.

There. I hope this clarifies rather than further muddles the issue. :-)

I'm going to go play basketball with the boys and see if I can't get a few more brain cells in gear!

David

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>
> Oops! If you specify LONG then you get 32-bit integers. So:
>
>   date = fix(0)
>   time = fix(0)
>   readu, lun, datafile, date, time
>
>   date = date AND 'FFFF'x
>   time = time AND 'FFFF'x
>

Double oops! Low voltage day or what!! Sorry about this noise.
I just meant that you need 16-bit integers when you read the
integers from the file (I'm assuming we're talking about shorts).
Of course, the last two lines should read:

 date = long(date) AND 'FFFF'x
 time = long(time) AND 'FFFF'x

as David Fanning suggested.

Sorry Dave.

--

  ~~~~~~ ~~~~~~
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Oops! If you specify LONG then you get 32-bit integers. So:

```
date = fix(0)
time = fix(0)
readu, lun, datafile, date, time

date = date AND 'FFFF'x
time = time AND 'FFFF'x
```

Of course, if you want 32-bit integers, use LONG like Dave suggested.

Dave
--

~~~~~~ ~~~~~~~
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READU, lun, datafile, date, time
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Convert them to the correct *unsigned* values, like this:

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Seeing the same question twice in the same week means it has to be tip material! I've put this answer on my web page for future reference.

Cheers!

David

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