Re: Reason for operator precedence

Source: http://sci.tech−archive.net/Archive/sci.math/2006−03/msg02435.html

* *From*: matt271829−news@xxxxxxxxxxx
* *Date*: 14 Mar 2006 10:13:57 −0800

briggs@xxxxxxxxxxxxxxxxx wrote:

> In article <1142344511.262841.322440@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
> matt271829−news@xxxxxxxxxxx writes:
>
> > bri...@xxxxxxxxxxxxxxxxx wrote:
> >
> > > In article
> > > <1142342196.542632.294210@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
> > > matt271829−news@xxxxxxxxxxx writes:
> > >
> > > > Tony wrote:
> > > >
> > > > > Hi all.
> > > > >
> > > > > Hope this isn't a silly question.
> > > > >
> > > > > I was wondering what the reason is for having multiple levels of operator precedence?
> > > > >
> > > > > Phrased another way, why is it that we don't just evaluate everything from left to right?
> > > > >
> > > > > Having multiple levels of precedence obviously adds complexity, so I assume there must be some payback. However, I don't see what it is.

> > > As far as addition/subtraction vs
> > > multiplication/division is concerned,
> > > one reason is to ensure that the distributive
> > > property of
> > > multiplication works sensibly. For example,
> > > we want 3*(4 + 6) = 3*4 +
> > > 3*6 = 3*(6 + 4) = 3*6 + 3*4.
> >
> > Remember that what we're talking about here is merely a
> > notational
> > convention. It has nothing whatsoever to do with the
> > distributive
> > property of multiplication over addition.
> >
> > You can express the distributive law for multiplication over
> > division
> > using parentheses:
> >
> > a*(b+c) = (a*b) + (b*c)
>
> Obviously you can. I meant to make it work without needing parentheses,
> but it seems that wasn't clear.

Ok. Try doing it using infix notation and the operator precedence
convention of your choice. Remember your rule: no parentheses

Left to right doesn't work.

b+c*a = a*b... and we're stuck

Right to left doesn't work.

b+c*a = ...b*c and we're stuck.

Multiplication has precedence over addition doesn't work.

a*... and we're stuck

Addition has precedence over multiplication doesn't work.

a*b+c = a*b+... and we're stuck

Accordingly, trying to point to this case as a motivation for some
particular choice of operator precedence seems ill conceived.

According to your argument, it follows that we are all using either
Polish (prefix) or Reverse Polish (postfix) notation.

Sorry, you've lost me. I was agreeing with you that even without any precedence convention we could still represent the distributive law as a*(b + c) = (a*b) + (a*c). However, the convention makes the parentheses redundant, because a*b + a*c is understood to mean (a*b) + (a*c). That's all I meant... possibly you are going into it at a deeper level than my simple observation warranted.

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