

## [2.20] *factor()* with respect to list elements

You can use *factor()* to simplify expressions which include list elements. To simplify this expression

```
a*d[1]+b*d[1]*d[2]+d[1]*d[2]*d[3]
```

factor with respect to the list *d*, like this

```
factor(a*d[1]+b*d[1]*d[2]+d[1]*d[2]*d[3],d)
```

which returns

```
d[1]*(d[2]*d[3]+d[2]*b+a)
```

This is not fully simplified, since *d[2]* is not completely factored out, so factor again with respect to *d[2]*:

```
factor(d[1]*(d[2]*d[3]+d[2]*b+a),d[2])
```

which returns the fully factored expression

```
(a+(b+d[3])*d[2])*d[1]
```

In this example, *a* and *b* are simple expressions, but the method also works if *a* and *b* are also lists.

*(Credit to Bhuvanesh Bhatt)*