

# COBOL Changes

## Details - I

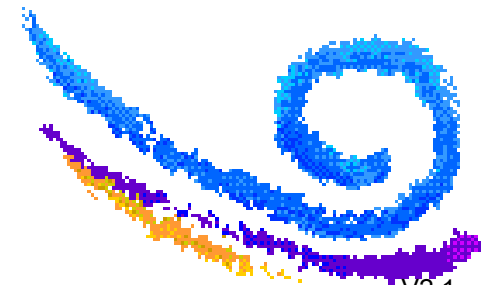
# COBOL Changes - format

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- ▶ COBOL programs may be written in mixed case, since at least 1988
  - Just a style issue, but studies have shown this is easier to read:

```
Identification division.  
program-id.  exer01.  
*  Copyright (C) 2009 by Steven H. Comstock  
  
environment division.  
input-output section.  
file-control.  
    select zinputa assign to zinputa.  
    select rept assign to rept.  
  
data division.  
file section.  
fd  zinputa  
    block contains 0 records.  
01  zinputa-record          pic x(100).  
  
fd  rept.  
01  rept-rec                pic x(106).
```

- ◆ Actually more than just style when you start processing XML from COBOL - XML is case sensitive

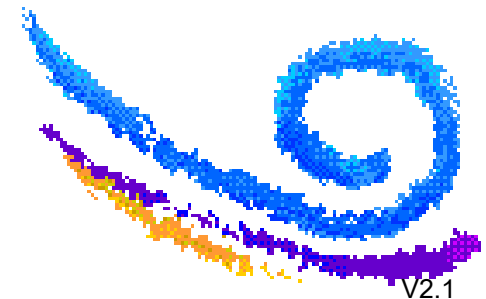


# COBOL Changes - format, continued

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- ▶ The word "filler" is optional
  - Makes data structure stand out more cleanly:

```
working-storage section.  
01 in-record.  
    05 in-part-number          pic x(9).  
    05 in-description         pic x(30).  
    05                         pic x(5).  
    05 in-unit-price          pic 9999v999.  
    05 in-quantity-on-hand    pic 99999.  
    05 in-quantity-on-ord     pic 999.  
    05 in-reorder-level       pic 999.  
    05 in-switch              pic xx.  
    05 in-old-part-no         pic x(9).  
    05 in-category            pic x(10).  
    05                         pic x(17).  
  
01 reprt-record.  
    05                         pic x(1) value spaces.  
    05 reprt-part-number       pic x(9).  
    05                         pic x(3) value spaces.  
    05 reprt-description      pic x(30).  
    05                         pic x(3) value spaces.  
    05 reprt-quantity-on-hand pic 99999.  
    05                         pic x(55) value spaces.
```

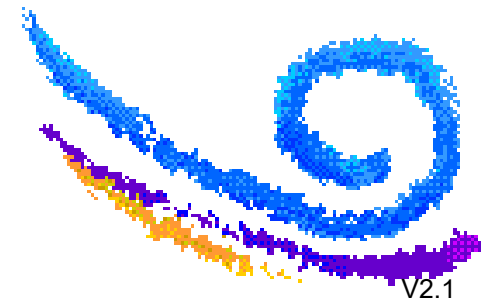


# COBOL Changes - format, continued

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- ▶ Data types can now be specified as "packed-decimal" instead of "comp-3" and "binary" instead of "comp"
- Again, a style issue, but it is more accurate / concise:

```
01  calc-stuff.  
   02  number-items  pic s9(9)   binary          value +0.  
   02  gross-sales   pic s9(v)99 packed-decimal value 0.00.  
   02  tax-rate      pic s9v999  packed-decimal value 0.062.
```



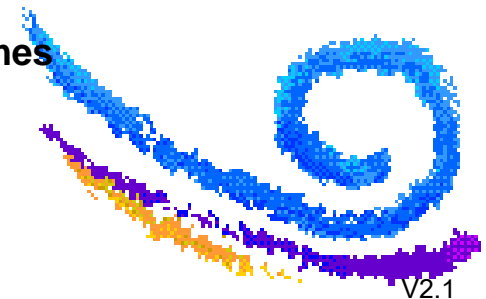
# COBOL Changes - format, continued

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- ▶ You can use the underscore ( `_` ) instead of a dash ( `-` ) in user defined words (data items, paragraphs, sections, and so on)
  - In Enterprise COBOL V4R2 and later; *e.g.*:

```
01  calc_stuff.  
    02  number_items  pic s9(9)    binary          value +0.  
    02  gross_sales   pic s9(v)99  packed-decimal value 0.00.  
    02  tax_rate      pic s9v999   packed-decimal value 0.062.
```

This is also useful for processing XML from COBOL, since most XML names tend to have underscores instead of dashes (although both are allowed)

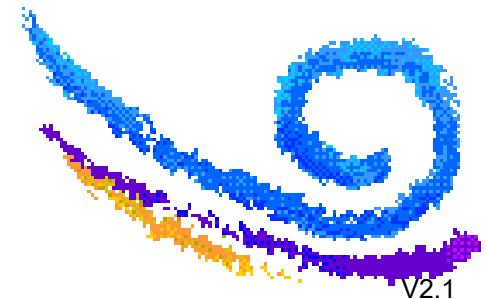


# COBOL Changes - Tables

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- ▶ Maximum of 7 dimensions (up from 3)
- ▶ Maximum of 128MB per table (up from 128K)
- ▶ Initialize table with VALUE at elementary level:

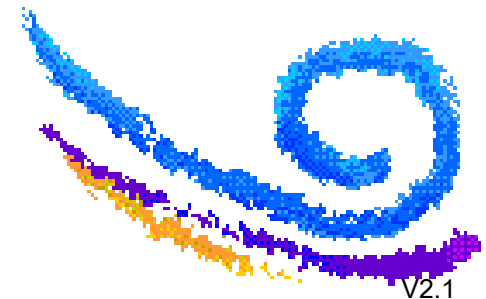
```
01 Sales-table.  
  05 Department occurs 20 times.  
    10 Dept-name pic x(20) value spaces  
    10 Dept-sales-amt pic s9(5)v99 packed-decimal value 0.
```



# COBOL Changes - Working-Storage

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- ▶ The size of working storage has been expanded to 128MB (up from 1MB)
  - Allows for more data-driven code and less fragmentation of routines, perhaps

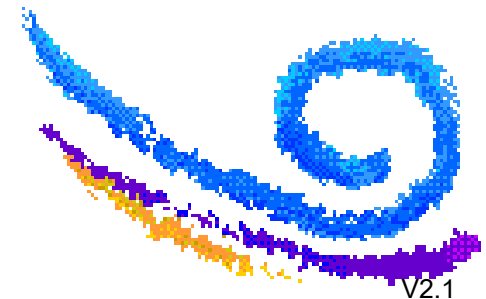


# Literals

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- ▶ Non-numeric literals may be bounded by single quotes (apostrophes) or double quotes - even in the same program
  - As long as the opening delimiter is the same as the closing delimiter
- ▶ Independent of the QUOTE / APOST compiler setting
  - Which now just indicates what character to use for the figurative constant QUOTE[S]

```
01 column-headers.  
02 pic x(10) value 'Employee Number'.  
02 pic x(3) value spaces.  
02 pic x(20) value "Last Name".
```





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