# Cobbler

## Overview

Cobbler is a desktop application for text editing of COBOL program text files. The tool offers basic light editing features and syntax highlighting. Cobbler was written by [Joshua Horvath](https://www.linkedin.com/in/joshua-horvath-a7493610/).

## Quick Start

On first launch of the Cobbler application a new Cobbler folder is created at the root level of the current user’s user folder. This folder is used to store application settings such as what display theme to load and locations of recently opened files.

## Open Files

### To open a COBOL text file:

1. From the **File** menu select the **Open…** menu option.
   1. If there are unsaved changes, a confirmation dialog will be presented allowing a chance to stop the current operation and save the current document.
      1. This unsaved changes check takes place for all operations were a file is opened, created, closed, or the application is shut down.
2. In the **Select a COBOL file** dialog, navigate to and select a COBOL text file.
   1. The file suffix filter is available, and on by default, to only allow COBOL files to be selected.
      1. The current COBOL file suffixes supported by this filter are:
         1. .cob, .cbl, .cpy, .pco, .fd, .sel, .ws
            1. These suffixes will be recognized with all lowercase or uppercase versions.
      2. The filter may be turned off to allow other types of text files to be opened.
3. Click the **Open** button.
4. The contents of the text file are displayed in the main text pane of the application window.

### To open a recent file:

Files that have been opened in Cobbler in the past can be reopened under the Recent Files menu.

1. From the **File** menu select the **Recent Files** submenu.
   1. Files that have been opened are listed in the Recent Files menu with full file paths displayed.
2. Select a file path from the submenu to open the file and display the contents in the Cobbler application.
   1. If the file was moved, renamed, or deleted, an error will be displayed.

## Save Files

1. From the **File** menu select the **Save** or **Save As…** menu option.
   1. If the **Save** option was selected, and file exists on the disk, then the changes will be written to the file and the operation ends. If the **Save** option was selected and the file does not exist on disk, then the **Save As** dialog is displayed.
2. In the **Save As** dialog, select a location to save the file, and edit the name of the file as needed, and click the **Save** button.
   1. If a file suffix is not added by hand, the file suffix “.cob” will automatically be appended.

## Edit Menu

The Edit menu features contain controls that are standard for a text editor including:

* Undo
* Redo
* Select All
* Copy
* Cut
* Paste

## Utilities Menu

The Utilities menu contains features that assist in the editing of text files and changing application settings.

* Go to line…
* Find…
* Replace…
* Add Line Numbers
* Remove Line Numbers
* Settings…

## Go to Line

Opens a dialog that allows quickly moving to a specific line number in the text file.

## Find and Replace Dialogs

Dialogs for finding and replacing text within the open text file are available under the Utilities menu. Results, such as find and replace counts, will appear in the status bar at the bottom of the application window. Closing the find or replace dialog will reset the status bar contents. Additionally, a find and replace toolbar is available that sits at the bottom of the main application window. This toolbar can be accessed from the Find/Replace Bar menu option.

## Add Line Numbers

Automatically add line numbers to COBOL files. Line numbers are incremented by ten. If the file already has line numbers, then the file will be renumbered. If the first six characters in each line are not either all digits (in the renumbering case) or all word spaces, then Cobbler may have trouble adding the line numbers without breaking changes. In this case a warning confirmation will be displayed, and Cobbler will do its best to add the line numbers without making breaking changes. COBOL code should not be wholly overwritten with numbers, in worst case statement code will be pushed to the right and may require minor editing. Note that tab characters may cause this behavior.

## Remove Line Numbers

Automatically remove hard coded line numbers from COBOL files. The first six columns of COBOL code are reserved for line numbers but are rarely needed in modern COBOL code. If Cobbler thinks it may have trouble removing line numbers from a file, a warning confirmation dialog will be presented. Also in this case, if Cobbler encounters a line where it finds anything other than digit characters in the first six columns, that line will be skipped. If after removing line numbers the number of lines skipped is greater than zero, then a pop-up dialog will be displayed stating how many lines were skipped.

## Application Settings

From the Utilities menu exists a menu option to open the Settings dialog. In this dialog the following options exist:

* A menu where the user can select a visual theme for the cobbler application, including a dark mode.
* A menu that allows user to specify the number of recent files to track and display in the Recent Files menu.
* A checkbox that gives an option to clear the recent files menu.
* A checkbox to enable or disable the spell checker.
* A checkbox to show or hide invisible characters.

Changes made in the Settings dialog take affect when the **Save** button is clicked.

## New Document Template

Because COBOL is a verbose programing language, a feature that can be helpful is to autogenerate a basic file structure without having to manual type some of the boilerplate header information.

1. From the **File** menu select the **New Document Template** menu option.
2. A new hello world COBOL program is displayed in the main text pane of the application window.
   1. The current user name is displayed as the Author.
   2. The current date, in the form MM/DD/YYYY is displayed as Date Written.

## Text Autocomplete

Text autocomplete is available through the key command, control + spacebar. On typing this key combination, a popup menu is displayed. This popup menu is populated with all the COBOL keywords and intrinsic functions stored inside of Cobbler. The popup menu is filtered by what characters are typed to the immediate left of the curser location in the editor.

## Spell Checker

Comments within COBOL code can be spell checked. When a word appears within a code comment that is not recognized, then a squiggle line appears under that word. The comment spell checker can be turned off and on in the settings dialog.

## Notes and Current Issues:

* Keywords are recognized in lowercase, uppercase, and title case.
  + Recognized:
    - DISPLAY
    - display
    - Display
  + Not recognized:
    - disPLAY
* Syntax highlighting is not complete.
  + COBOL keywords containing a word space may not highlight correctly in the second word.
  + Sometimes a word may not highlight correctly if there is not a word space after the keyword.
  + Keywords containing a hyphen may not highlight.
* The feature checking for unsaved changes is currently a little buggy sometimes.
* Status bar at bottom of window main sometimes temporarily disappear when using the Find/Replace toolbar.

# Appendix I

## COBOL Reserved Words

accept

access

add

address

advancing

after

all

allowing

alphabet

alphabetic

alphabetic-lower

alphabetic-upper

alphanumeric

alphanumeric-edited

also

alter

alternate

and

any

apply

are

area

areas

ascending

assign

at

author

auto [xopen]

automatic

autoterminate

background-color [xopen]

batch

before

beginning

bell [xopen]

binary

binary-char [200x]

binary-double [200x]

binary-long [200x]

binary-short [200x]

bit

bits

blank

blink [xopen]

blinking

block

bold

boolean

bottom

by

call

cancel

cd

cf

ch

changed

character

characters

class

clock-units

close

cobol

code

code-set

col [200x]

collating

column

comma

commit

common

communication

comp

comp-1

comp-2

comp-3

comp-4

comp-5

comp-6

comp-x

computational

computational-1

computational-2

computational-3

computational-4

computational-5

computational-6

computational-x

compute

concurrent

configuration

connect

contain

contains

content

continue

control

controls

conversion

converting

copy

core-index

corr

corresponding

count

crt

currency

current

cursor

data

date

date-compiled

date-written

day

day-of-week

db

db-access-control-key

db-condition

db-current-record-id

db-current-record-name

db-exception

db-key

db-record-name

db-set-name

db-status

db-uwa

dbcs

dbkey

de

debug-contents

debug-item

debug-length

debug-line

debug-name

debug-numeric-contents

debug-size

debug-start

debug-sub

debug-sub-1

debug-sub-2

debug-sub-3

debug-sub-item

debug-sub-n

debug-sub-num

debugging

decimal-point

declaratives

default

delete

delimited

delimiter

dependency

depending

descending

descriptor

destination

detail

dictionary

disable

disconnect

disp

display

display-1

display-6

display-7

display-9

divide

division

does

down

duplicate

duplicates

echo

editing

egi

eject

else

emi

empty

enable

end

end-accept

end-add

end-call

end-commit

end-compute

end-connect

end-delete

end-disconnect

end-divide

end-erase

end-evaluate

end-fetch

end-find

end-finish

end-free

end-get

end-if

end-keep

end-modify

end-multiply

end-of-page

end-perform

end-read

end-ready

end-receive

end-reconnect

end-return

end-rewrite

end-rollback

end-search

end-start

end-store

end-string

end-subtract

end-unstring

end-write

ending

enter

entry

environment

eol [xopen]

eop

eos [xopen]

equal

equals

erase [xopen]

error

esi

evaluate

every

examine

exceeds

exception

exclusive

exhibit

exit

exor

extend

external

failure

false

fd

fetch

file

file-control

filler

final

find

finish

first

float-extended [200x]

float-long [200x]

float-short [200x]

footing

for

foreground-color [xopen]

free

from

full [xopen]

function

generate

get

giving

global

go

goback

greater

group

heading

high-value

high-values

highlight [xopen]

i-o

i-o-control

id

ident

identification

if

in

including

index

indexed

indicate

initial

initialize

initiate

input

input-output

inspect

installation

into

invalid

is

just

justified

kanji

keep

key

label

last

ld

leading

left

length

less

limit

limits

linage

linage-counter

line

line-counter

lines

linkage

locally

lock

lock-holding

low-value

low-values

lowlight [xopen]

manual

match

matches

member

membership

memory

merge

message

mode

modify

modules

move

multiple

multiply

named

native

negative

next

no

non-null

not

note

null

number

numeric

numeric-edited

object-computer

occurs

of

off

offset

omitted

on

only

open

optional

options [200x]

or

order

otherwise

packed-decimal

padding

page

page-counter

password

perform

pf

ph

pic

picture

plus

pointer

position

positioning

positive

previous

printing

prior

procedure

procedures

proceed

program

program-id

protected

purge

queue

quote

quotes

random

rd

read

readers

ready

realm

realms

receive

reconnect

record

record-name

record-overflow

recording

records

redefines

reel

reference

reference-modifier

references

regardless

relative

release

reload

remainder

remarks

removal

renames

reorg-criteria

replace

replacing

report

reporting

reports

required [xopen]

rerun

reserve

reset

retaining

retrieval

return

return-code [xopen]

returning

reverse-video [xopen]

reversed

rewind

rewrite

rf

rh

right

rms-current-filename

rms-current-sts

rms-current-stv

rms-filename

rms-sts

rms-stv

rollback

rounded

run

same

screen [xopen]

sd

search

section

secure [xopen]

security

segment

segment-limit

select

send

sentence

separate

sequence

sequence-number

sequential

service

set

sets

sign

signed [200x]

size

skip1

skip2

skip3

sort

sort-merge

source

source-computer

space

spaces

special-names

standard

standard-1

standard-2

start

status

stop

store

stream

string

sub-queue-1

sub-queue-2

sub-queue-3

sub-schema

subtract

success

sum

suppress

symbolic

sync

synchronized

table

tallying

tape

tenant

terminal

terminate

test

text

than

then

through

thru

time

times

to

top

trace

trailing

transform

true

type

underline [xopen]

underlined

unequal

unit

unlock

unsigned [200x]

unstring

until

up

update

updaters

upon

usage

usage-mode

use

using

value

values

varying

vfu-channel

wait

when

where

with

within

words

working-storage

write

writers

zero

zeroes

zeros

# Appendix II

COBOL Intrinsic Functions

acos

add-duration

annuity

asin

atan

char

convert-date-time

cos

current-date

date-of-integer

day-of-integer

day-to-yyyyddd

extract-date-time

date-to-yyyymmdd

display-of

factorial

find-duration

integer

integer-of-date

integer-of-day

integer-part

length

locale-date

locale-time

log

log10

lower-case

max

mean

median

midrange

min

mod

national-of

numval

numval-c

ord

ord-max

ord-min

present-value

random

range

rem

reverse

sin

sqrt

standard-deviation

subtract-duration

sum

tan

test-date-time

trim

triml

trimr

upper-case

variance

utf8string

when-compiled

year-to-yyyy