Metapost Luafication

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This talk explains how to call lua from Metafun code.

Let's do a very simple example first ...

```
\startluacode
function MP.doit(a)
    mp.print("unitsquare scaled " .. a)
end
\stopluacode

\startMPcode
   fill lua.MP.doit(100);
\stopMPcode
```

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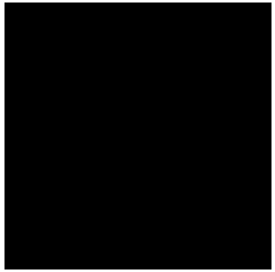

- ☐ you define a lua function in the `MP` table: `MP.doit()`
- ☐ that function uses one of the `mp.xxx()` helpers to produce output
- ☐ the METAPOST macro `lua` converts its arguments into a Lua call
- ☐ and converts the output back into METAPOST code

Now, let me try to explain what actually happens. First, on the Lua side ...

- The compiled MPLib library contains an extension that adds a new METAPOST primitive operation with the name `runscript`.
- This new primitive accepts a string as input and (is expected to) produce a string as output.
- The output of `runscript` is then internally converted back into METAPOST code.
- The script code to be run is set up during the creation of the METAPOST library instance.

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Of course CONTEXT uses Lua for this extension, so it contains the following code:

```
local mpx, terminal = new_instance {
    ...
    run_script   = metapost.runscript,
    ...
}
```

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`metapost.runscript` is a Lua function that uses `loadstring` to convert the input string into Lua code, and it returns an internal buffer as the result of the call to `runscript`.

That buffer is itself filled by the `mp.xxx()` helper functions.

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On the METAPOST side, it would not be very nice if you had to code your Lua like this:

```
\startMPcode
   runscript ("MP.doit(" & decimal 100 & ")");
\stopMPcode
```

So, that is where the METAPOST `lua` macros comes in handy.

This is an METAPOST `vardef` that converts its suffixes and arguments into a Lua string for you, and then calls `runscript` internally.

That's it, really.

The Metafun manual has a list of those `mp.xxx()` helper functions.

Or you can look at `mlib-mpf` yourself (there are mkiv and lmtx versions).

When in doubt, you can always use `mp.print("string")`

Just make sure that the `"string"` is valid METAPOST.

Handy to know:

- ☐ The Metafun manual contains (much) more information than this talk
- ☐ METAPOST's `lua` is defined in `mp-luas` (again in mkiv and lmtx versions)
- ☐ Your Lua functions can do just about anything because the result is processed immediately.
- ☐ And there is a tracker you can turn on: `metapost.lua`