Customizable U-Hook

A Parametric 3D file
by Serge Payen, 2016
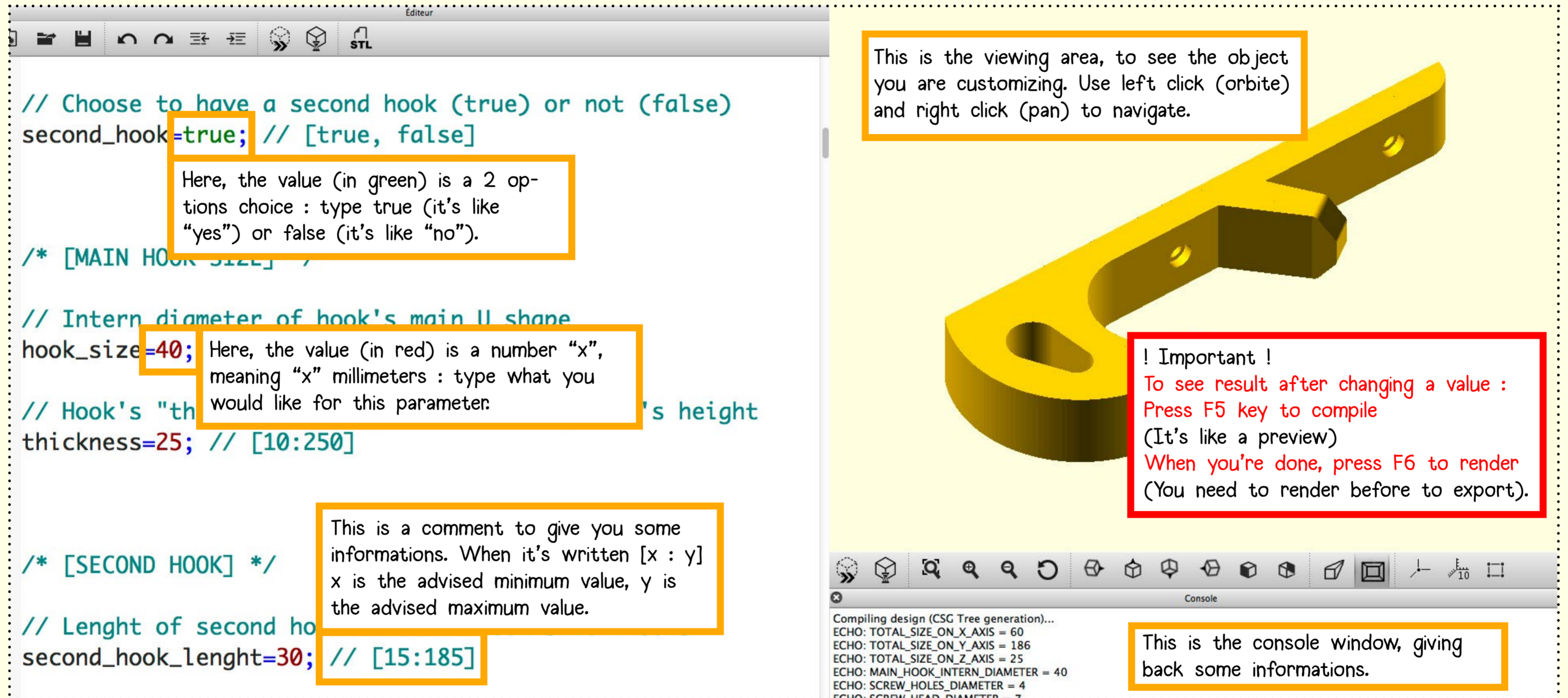
www.sergepayen.fr/en/parametric-u-hook

Customizable U-HOOK : How to use this file ?

Solution 1 : Open it with OpenScad software (it's free and open-source - http://www.openscad.org/downloads.html)

Allmost everything happen in the "editor" (left column).
Scroll it down to the "SETTINGS" chapter.

Editeur

```
// Choose to have a second hook (true) or not (false)
second_hook=true; // [true, false]
```

Here, the value (in green) is a 2 options choice : type true (it's like "yes") or false (it's like "no").

```
/* [MAIN HOOK SIZE] */

// Intern diameter of hook's main U shape
hook_size=40;
```

Here, the value (in red) is a number "x", meaning "x" millimeters : type what you would like for this parameter.

```
// Hook's "th...                          's height
thickness=25; // [10:250]
```

This is the viewing area, to see the object you are customizing. Use left click (orbite) and right click (pan) to navigate.

! Important !
To see result after changing a value :
Press F5 key to compile
(It's like a preview)
When you're done, press F6 to render
(You need to render before to export).

```
/* [SECOND HOOK] */

// Lenght of second ho...
second_hook_lenght=30; // [15:185]
```

This is a comment to give you some informations. When it's written [x : y] x is the advised minimum value, y is the advised maximum value.
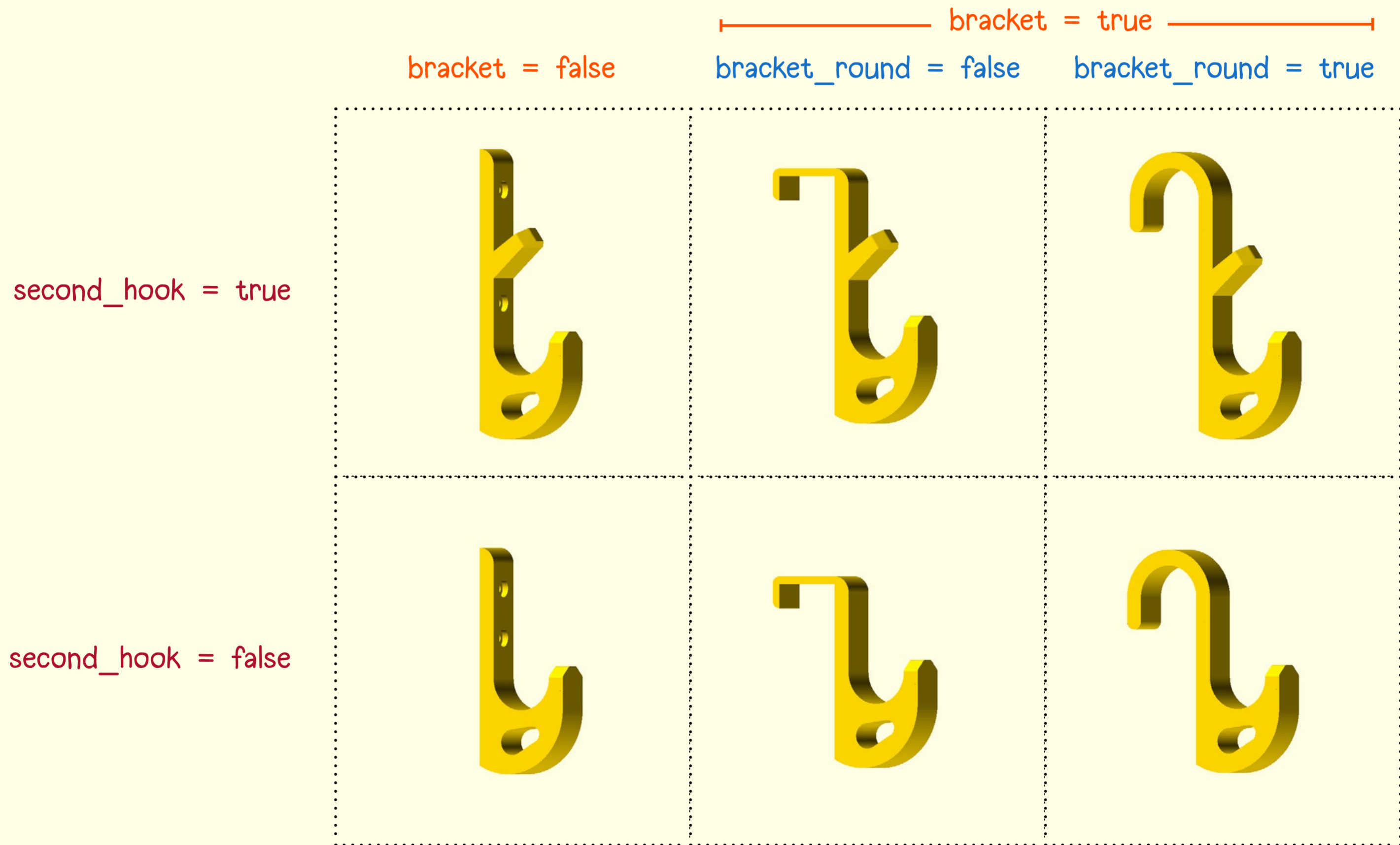
Compiling design (CSG Tree generation)...
ECHO: TOTAL_SIZE_ON_X_AXIS = 60
ECHO: TOTAL_SIZE_ON_Y_AXIS = 186
ECHO: TOTAL_SIZE_ON_Z_AXIS = 25
ECHO: MAIN_HOOK_INTERN_DIAMETER = 40
ECHO: SCREW_HOLES_DIAMETER = 4
ECHO: SCREW_HEAD_DIAMETER = 7

This is the console window, giving back some informations.

Finally, at your screen's top, go to File / Export / Export as STL => choose a filename and click "Export"
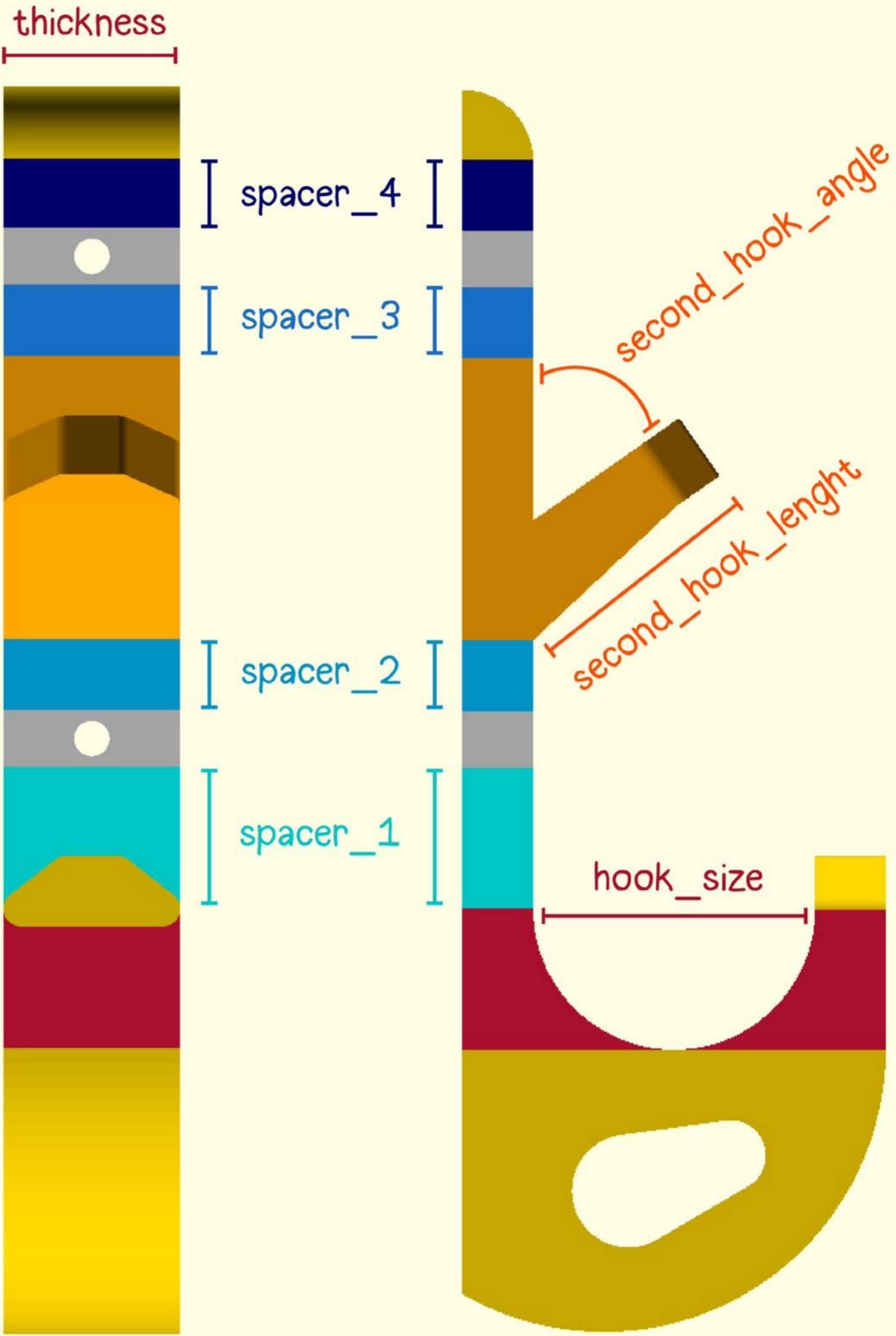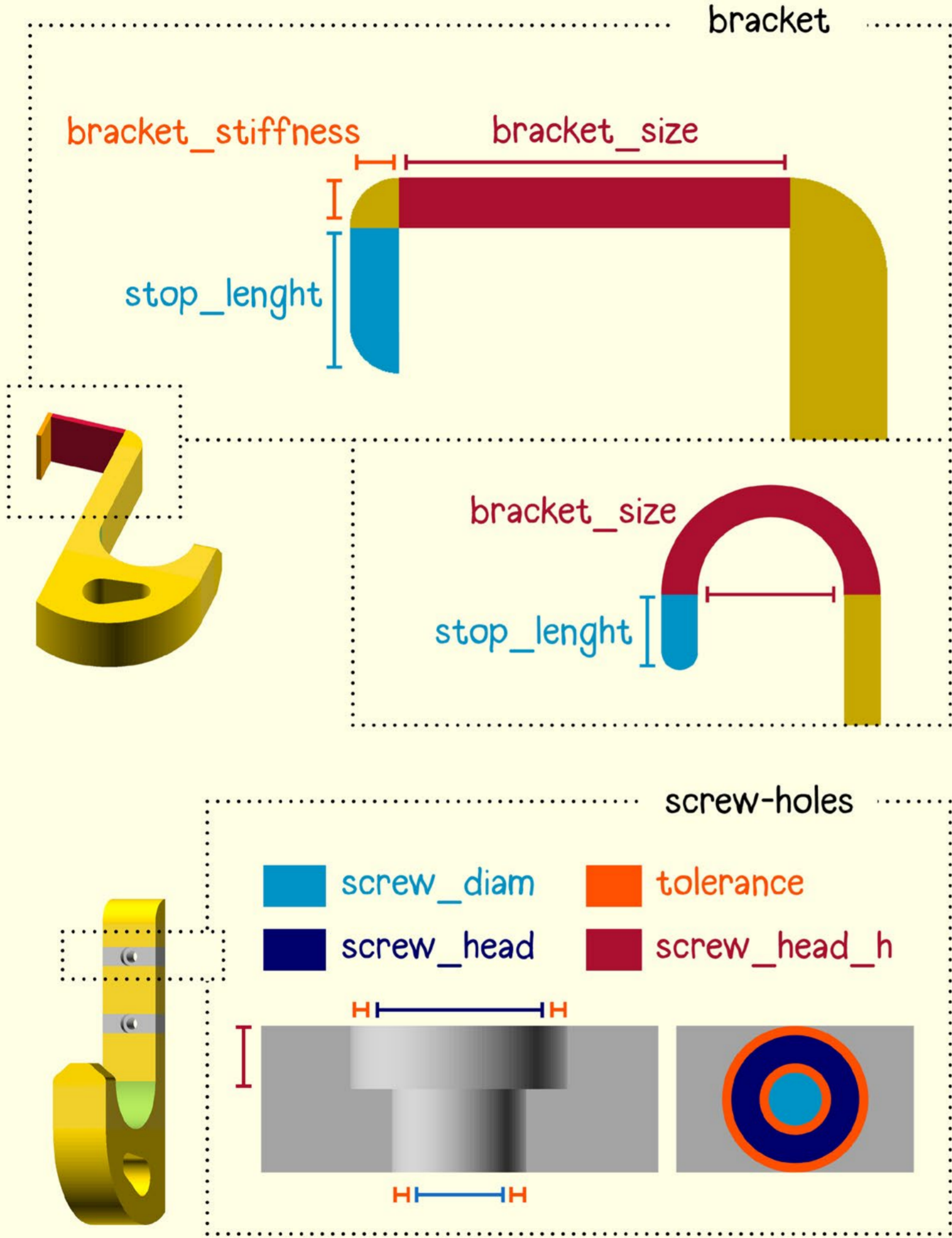Then send this STL file to your 3D printer !

Solution 2 : If you're a Thingiverse user (and have a Thingiverse account), you can use the "Customizer".
Go to object's page and click on the fat button "Open in Customizer".

Customizable U-HOOK : Choose Shape

Choose global shape with parameters « bracket », « bracket_round » and « second_hook ».
Each can take the value « true » (same as "YES") or « false » (same as "NO").

	bracket = false	bracket = true	
		bracket_round = false	bracket_round = true
second_hook = true			
second_hook = false			

Customizable U-HOOK : Choose Size

bracket

bracket_stiffness

bracket_size

stop_lenght

bracket_size

stop_lenght

screw-holes

screw_diam	tolerance
screw_head	screw_head_h

thickness

spacer_4

spacer_3

spacer_2

spacer_1

second_hook_angle

second_hook_lenght
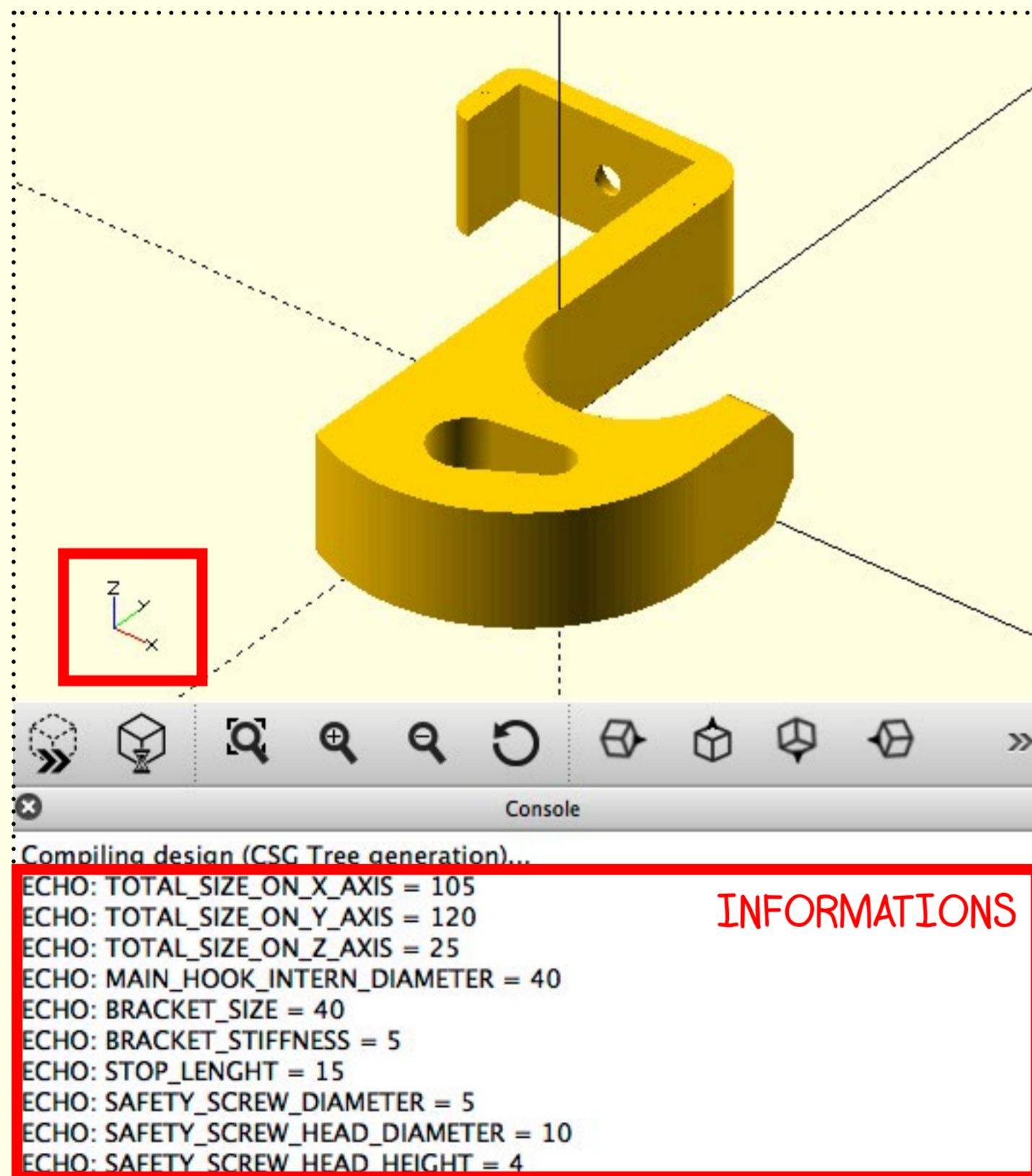
hook_size

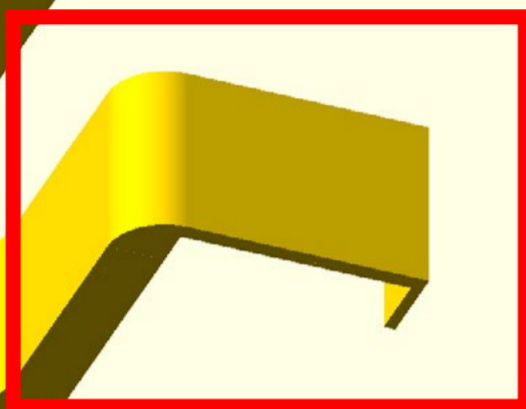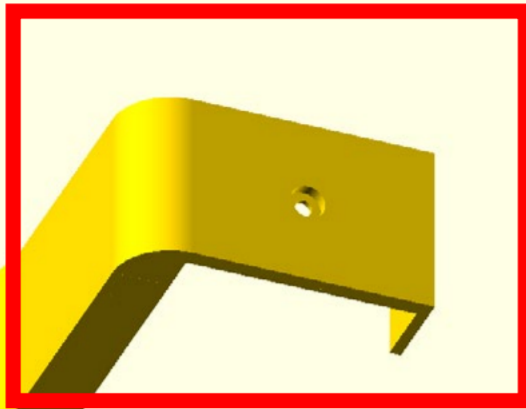# Customizable U-HOOK : Console window, informations & warnings

After each compilation (F5 Key), you will find many informations about global size and each element specific size inside the console window (text area below viewing area).
If some values are illogic, or could degrade hook's efficiency, there will be also warnings and advises about values you should adjust.

Console

Compiling design (CSG Tree generation)...
ECHO: TOTAL_SIZE_ON_X_AXIS = 105
ECHO: TOTAL_SIZE_ON_Y_AXIS = 120
ECHO: TOTAL_SIZE_ON_Z_AXIS = 25
ECHO: MAIN_HOOK_INTERN_DIAMETER = 40
ECHO: BRACKET_SIZE = 40
ECHO: BRACKET_STIFFNESS = 5
ECHO: STOP_LENGHT = 15
ECHO: SAFETY_SCREW_DIAMETER = 5
ECHO: SAFETY_SCREW_HEAD_DIAMETER = 10
ECHO: SAFETY_SCREW_HEAD_HEIGHT = 4

INFORMATIONS

Console

ECHO: SECOND_HOOK_LENGHT = 120
ECHO: SECOND_HOOK_ANGLE = 125
ECHO: " WARNING : Screw Holes seems too big compare to Thickness "
ECHO: " WARNING : Screw Head Height seems too big compare to Hook Size"
ECHO: " WARNING : Second Hook Lenght should be smaller than Hook Size "
ECHO: " WARNING : Best values for Second Hook Angle are between 45° and 65° "
Compiling design (CSG Products generation)...
Geometries in cache: 28
Geometry cache size in bytes: 386576
CGAL Polyhedrons in cache: 0
CGAL cache size in bytes: 0
Compiling design (CSG Products normalization)...
Normalized CSG tree has 23 elements
Compile and preview finished.
Total rendering time: 0 hours, 0 minutes, 0 seconds

WARNINGS

safety_screw = true

safety_screw = false

If you choosed the hook with rectangular "bracket", it may be good to have a safety screw to lock hook into place.
If you need it, type "safety_screw=true" in "extra settings".
It will use the screw parameters defined in "screw-holes" part.

If you input a big "thickness" value,
the file will generate 4 screw-holes,
so you can make a VERY fat hook.

To remove the triangle extremity,
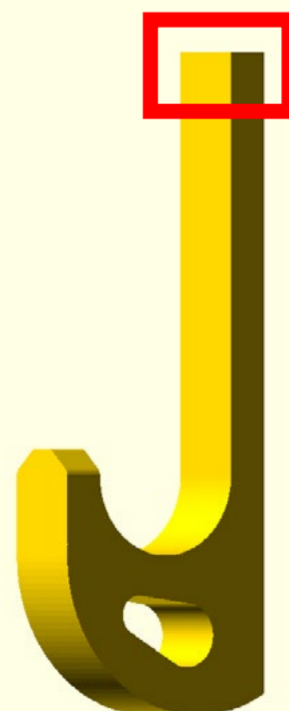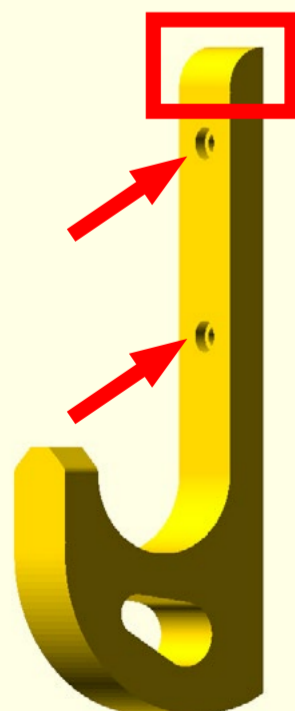input "extremity=false" in extra settings.
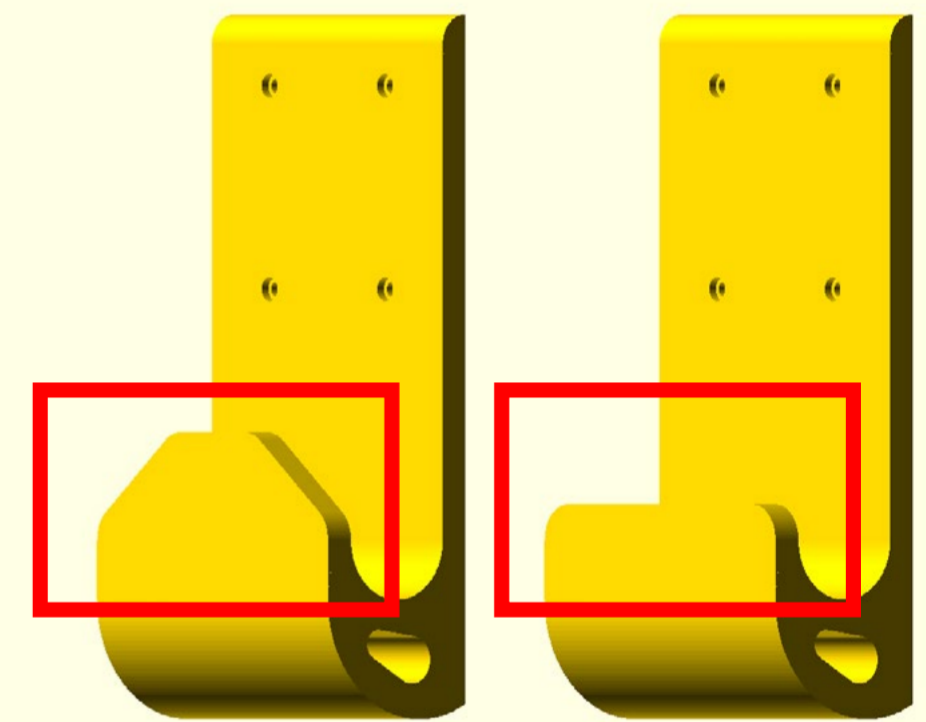
extremity = true   extremity = false

screw_holes = true   screw_holes = false
rounded_top = true   rounded_top = false

But maybe you want to mash-up a hook with another 3D object.
For better integration you may need the hook's shape with no screw-holes,
and maybe a flat top :
Input "screw_holes=false" and/or "rounded_top=false" in extra settings.