

# Tvorba 3D modelů - OpenSCAD

- <https://openscad.org>
- různé operační systémy
- zdrojový kód
- manualy
- příklady
- videa s návody

# Ovládání

- F5 - rychlý náhled
- F6 - renderování
- F7 - export 3D modelu do formátu STL
- menu

# Příkazy

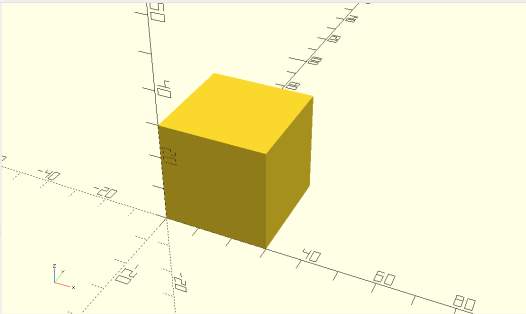
- `cube(30);`
- `cube([30,20,10]);`

Bezejmenný.scad\* — OpenSCAD

Soubor Uprav Design Zobrazit Window Nápověda

Editor

```
1 cube(30);
```



Viewport: translate = [20.46 19.85 13.35], rotate = [35.50 0.00 25.00], distance = 213.38, fov = 22.50 (1110454)

Konzole

Parsing design (AST generation)...

Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-VRBDQMg.scad

Compiling design (CSG Tree generation)...

Rendering Polygon Mesh using CGAL...

Geometries in cache: 1

Geometry cache size in bytes: 728

CGAL Polyhedrons in cache: 0

CGAL cache size in bytes: 0

Total rendering time: 0:00:00.015

Top level object is a 3D object:

Facets: 6

Rendering finished.

Error-Log

Show Vise

Group	File	Line	Info
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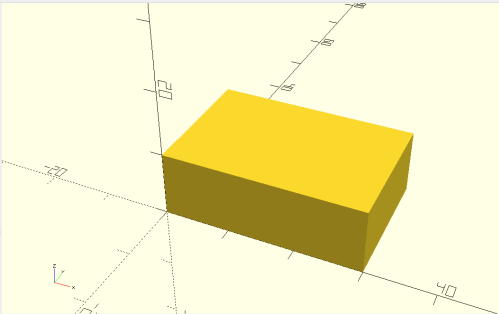
OpenSCAD 2021.01

Bezejmenný.scad\* — OpenSCAD

Soubor Uprav Design Zobrazit Window Napovkda

Editor

```
1 cube([30,20,10]);
```



Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-1788004.scad  
Compiling design (CSG Tree generation)...  
Compiling design (CSG Products generation)...  
Geometries in cache: 2  
Geometry cache size in bytes: 1456  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Compiling design (CSG Products normalization)...  
Normalized tree has 1 elements!  
Compile and preview finished.  
Total rendering time: 0:00:00.017

Error-Log

Show Vise

Group	File	Line	Info
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Viewport: translate = [ 11.03 10.05 6.35 ], rotate = [ 35.00 0.00 25.00 ], distance = 113.40, fov = 22.50 (1110x54)

OpenSCAD 2021.01

- `cylinder(d=20, h=20);`
- `cylinder(r=10, h=20);`
- `cylinder(d=20, h=20, $fn=6);`
- `cylinder(d1=30,d2=10, h=20);`

Bezejmennj.scad\* — OpenSCAD

Soubor Upravít Design Zobrazit Window Nápověda

Editor

```
1 cylinder(d=20, h=20);
```

Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-198BDMj.scad  
Compiling design (CSG Tree generation)...  
Rendering Polygon Mesh using CGAL...  
Geometries in cache: 3  
Geometry cache size in bytes: 5928  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Total rendering time: 0:00:00.013  
Top level object is a 3D object:  
Facets: 32  
Rendering finished.

Error-Log

Group	File	Line	Info
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Viewport: translate = [-0.79 5.46 7.54], rotate = [55.00 0.00 25.00], distance = 113.40, fov = 22.50 (1110x654)

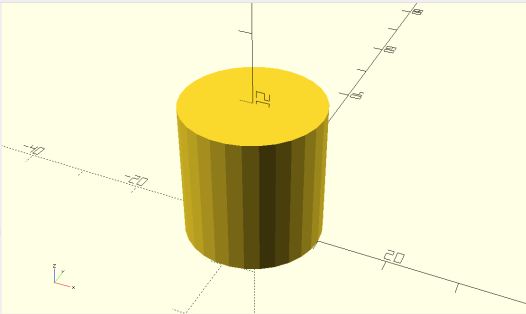
OpenSCAD 2021.01

Bezejmennj.scad\* — OpenSCAD

Soubor Upravít Design Zobrazit Window Nápověda

Editor

```
1 cylinder(r=10, h=20);
```



Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-198B0Mj.scad  
Compiling design (CSG Tree generation)...  
Rendering Polygon Mesh using CGAL...  
Geometries in cache: 3  
Geometry cache size in bytes: 5928  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Total rendering time: 0:00:00.015  
Top level object is a 3D object:  
Facets: 32  
Rendering finished.

Error-Log

Group	File	Line	Info
-------	------	------	------

Viewport: translate = [-0.79 5.46 7.54], rotate = [55.00 0.00 25.00], distance = 113.40, fov = 22.50 (1110x654)

OpenSCAD 2021.01



Bezejmenný.scad\* — OpenSCAD

Soubor Upravít Design Zobrazit Window Nápověda

Editor

```
1 cylinder(d=20, h=20, $fn=6);
```

Konzole

```
Parsing design (AST generation)...
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-
YRBDQMg.scad
Compiling design (CSG Tree generation)...
Rendering Polygon Mesh using CGAL...
Geometries in cache: 4
Geometry cache size in bytes: 6944
CGAL Polyhedrons in cache: 0
CGAL cache size in bytes: 0
Total rendering time: 0:00:00.014
Top level object is a 3D object:
Facets: 8
Rendering finished.
```

Error-Log

Show Vše

Group	File	Line	Info
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Viewport: translate = [-0.79 5.46 7.54], rotate = [41.70 0.00 23.60], distance = 113.40, fov = 22.50 (1110x654)

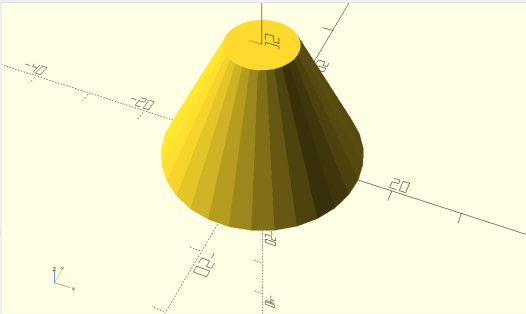
OpenSCAD 2021.01

Bezejmennj.scad\* — OpenSCAD

Soubor Upravít Design Zobrazit Window Nápověda

Editor

```
1 cylinder(d1=30,d2=10, h=20);
```



Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-TRBDQmJ.scad  
Compiling design (CSG Tree generation)...  
Rendering Polygon Mesh using CGAL...  
Geometries in cache: 5  
Geometry cache size in bytes: 12856  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Total rendering time: 0:00:00.032  
Top level object is a 3D object:  
Facets: 62  
Rendering finished.

Error-Log

Show Vise

Group	File	Line	Info
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Viewport: translate = [1.32 -2.07 0.64], rotate = [41.70 0.00 23.60], distance = 113.40, fov = 22.50 (1110x654)

OpenSCAD 2021.01

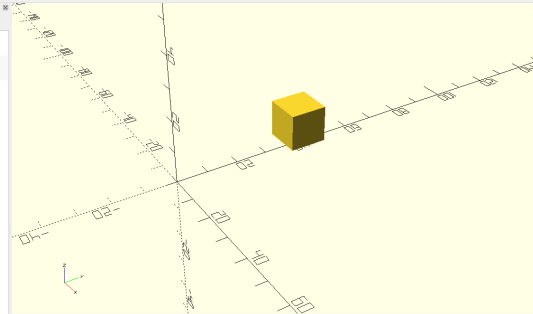
- `translate([20,20,20])`
- `rotate([45,0,0])`

Bezejmenný.scad\* — OpenSCAD

Soubor Upravtej Design Zobrazit Window Nápověda

Editor

```
1 translate([20,20,20])
2 cube(10);
```



Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-178BD0Mj.scad  
Compiling design (CSG Tree generation)...  
Rendering Polygon Mesh using CGAL...  
Geometries in cache: 7  
Geometry cache size in bytes: 14312  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Total rendering time: 0.0050014  
Top level object is a 3D object:  
Facets: 6  
Rendering finished.

Error-Log

Group	File	Line	Info
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Viewport: translate = [20.54 20.57 12.27], rotate = [37.10 0.00 57.90], distance = 213.38, fov = 22.50 (11104854)

OpenSCAD 2021.01

Bezejmenný scad\* — OpenSCAD

Soubor Uprav Design Zobrazit Window Nápověda

Editor

```
1 rotate([45,0,0])
2 cube(10);
```

Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-1783204.scad  
Compiling design (CSG Tree generation)...  
Compiling design (CSG Products generation)...  
Geometries in cache: 8  
Geometry cache size in bytes: 15040  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Compiling design (CSG Products normalization)...  
Normalized tree has 1 elements!  
Compile and preview finished.  
Total rendering time: 0:00:00.017

Error-Log

Show Vise

Group	File	Line	Info
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Viewport: translate = [17.22 -0.71 8.80 ], rotate = [ 67.80 0.00 120.20 ], distance = 91.85, fov = 22.50 (1110x654)

OpenSCAD 2021.01

- union()...
- difference()...

Bezejmennyj.scad\* — OpenSCAD

Soubor Upravat Design Zobrazit Window Nápověda

Editor

```
1 union(){
2   cube([30,30,10]);
3   cylinder(d=20, h=20);
4 }
5
6
```

The 3D view shows a yellow cube and a yellow cylinder. The cylinder is positioned on top of the cube, centered along the cube's width. The scene is set against a light yellow background with a 3D coordinate system (x, y, z) visible. Dimension lines and arrows indicate the size and position of the objects.

Konzole

Geometry cache size in bytes: 15768  
CGAL Polyhedrons in cache: 1  
CGAL cache size in bytes: 93736  
Total rendering time: 0:00:00.548  
Top level object is a 3D object:  
Simples: yes  
Vertices: 69  
Halfedges: 208  
Edges: 104  
Halfedges: 74  
Facets: 37  
Volumes: 2  
Rendering finished.

Error-Log

Show Vise

Group	File	Line	Info
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Viewport: translate = [110.01 6.80 4.26], rotate = [42.40 0.00 69.10], distance = 140.00, fov = 22.50 (1150x654)

OpenSCAD 2021.01

Bezejmenný.scad\* — OpenSCAD

Soubor Upravat Design Zobrazit Window Nápověda

Editor

```

1 rotate([0,45,0])
2 union(){
3     cube([30,30,10]);
4     cylinder(d=20, h=20);
5 }
6
7

```

Konzole

```

Geometry cache size in bytes: 15768
CGAL Polyhedrons in cache: 3
CGAL cache size in bytes: 220320
Total rendering time: 0:00:00.034
Top level object is a 3D object:
Samples:    yes
Vertices:   69
Halfedges: 208
Edges:      104
Halfedges:  74
Facets:     37
Volumes:    2
Rendering finished.

```

Error-Log

Group	File	Line	Info

Viewport: translate = [115.57 13.31 8.27], rotate = [66.90 0.00 39.00], distance = 213.38, fov = 22.50([110x654])

OpenSCAD 2021.01



Bezejmenný.scad\* — OpenSCAD

Soubor Uprav Design Zobrazit Window Nápověda

Editor

```
1 difference(){
2   cube([30,30,10]);
3   cylinder(d=20, h=20);
4 }
5
6
```

Konzole

Geometry cache size in bytes: 15768  
CGAL Polyhedrons in cache: 2  
CGAL cache size in bytes: 126584  
Total rendering time: 0:00:00.085  
Top level object is a 3D object:  
Simpler: yes  
Vertices: 24  
Halfedges: 72  
Edges: 36  
Halfedges: 28  
Facets: 14  
Volumes: 2  
Rendering finished.

Error-Log

Group	File	Line	Info
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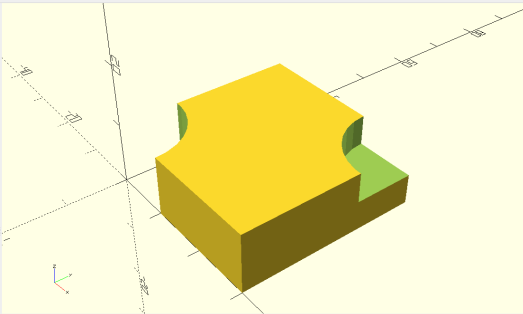
Viewport: translate = [110.01 6.80 4.26], rotate = [41.00 0.00 32.70], distance = 140.00, fov = 22.50 (1150x654)

OpenSCAD 2021.01

Bezejmennyj.scad\* — OpenSCAD

Soubor Upravat Design Zobrazit Window Napovkda  
Editor

```
1 difference(){  
2     cube([30,30,10]);  
3     //prvni valec  
4     cylinder(d=20, h=20);  
5     //druhy valec  
6     translate([30,30,5])  
7     cylinder(d=20,h=20);  
8 }  
9  
10
```



Konzole

Geometry cache size in bytes: 20240  
CGAL Polyhedrons in cache: 4  
CGAL cache size in bytes: 277360  
Total rendering time: 0:00:00.014  
Top level object is a 3D object:  
Simpler: yes  
Vertices: 42  
Halfedges: 120  
Edges: 63  
Half-facets: 46  
Facets: 23  
Volumes: 2  
Rendering finished.

Error-Log

Group	File	Line	Info
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Viewport: translate = [15.62 14.83 6.50], rotate = [53.60 0.00 52.30], distance = 113.40, fov = 22.50([110x54])

OpenSCAD 2021.01

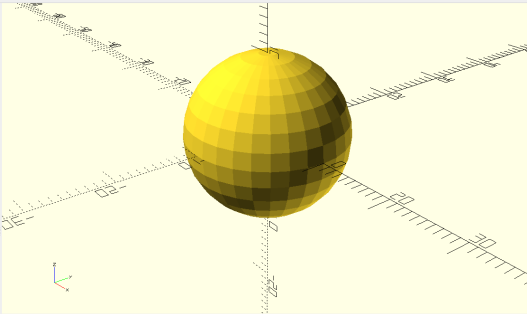
- `sphere(d=20);`

Bezejmenný.scad\* — OpenSCAD

Source | Edit | Design | View | Window | Help

Editor

```
1 sphere(d=20);
```



Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-namfmes.scad  
Compiling design (CSG Tree generation)...  
Rendering Polygon Mesh using CGAL...  
Geometries in cache: 1  
Geometry cache size in bytes: 62072  
CGAL Polyhedrons in cache: 0  
CGAL cache size in bytes: 0  
Total rendering time: 0:00:00.032  
Top level object is a 3D object:  
Facets: 842  
Rendering finished.

Error-Log

Group	File	Line	Info
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Viewport: translate = [11.21 -1.32 -2.44], rotate = [63.40 0.00 52.30], distance = 91.85, fov = 22.50 (11104954)

OpenSCAD 2021.01

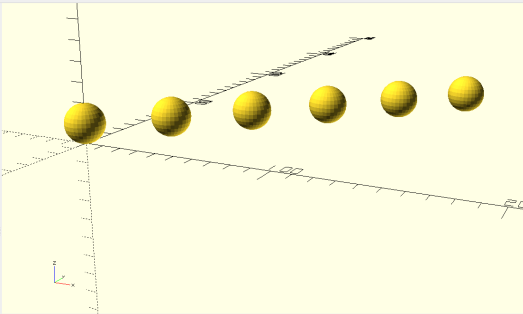
- `for(i=[0:1:5]) ...;`

Bezejmenný.scad\* — OpenSCAD

Soubor Upravít Design Zobrazit Window Nápověda

Editor

```
1 for(i=[0:1:5])
2   translate([i*30,i*30,10])
3     sphere(d=20);
```



Konzole

Parsing design (AST generation)...  
Saved backup file: /home/pavel/.local/share/OpenSCAD/backups/unsaved-backup-namfueu.scad  
Compiling design (CSG Tree generation)...  
Compiling design (CSG Products generation)...  
Geometries in cache: 4  
Geometry cache size in bytes: 248288  
CGAL Polyhedrons in cache: 1  
CGAL cache size in bytes: 3252960  
Compiling design (CSG Products normalization)...  
Normalized tree has 6 elements!  
Compile and preview finished.  
Total rendering time: 0:00:00.021

Error-Log

Show Vše

Group	File	Line	Info
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Viewport: translate = [69.82 55.20 -13.23 ], rotate = [ 73.20 0.00 26.40 ], distance = 401.52, fov = 22.50 (1110454)

OpenSCAD 2021.01