Oaktree Manual

May 15, 2012

Contents

Chapter 1

Introduction

Chapter 2

Installation

Chapter 3

Running

Chapter 4

Input

Oaktree input language extends Python. Subroutines and objects related to input processing are listed below.

4.1 SIMULATION

SIMULATION object stores data specific to one distinct analysis.

obj = SIMULATION (outpath, duration, step, cutoff)

- **obj** - SIMULATION object
- **outpath** - output directory path
- **duration** - simulation duration
- **step** - time step
- **cutoff** - cutoff length below which geometrical details are not resolved

4.2 SPHERE

A sphere shape.

obj = SPHERE (center, r, scolor)

- **obj** - SHAPE object
- **center** - tuple (x, y, z) defining the center
- **r** - radius
- **scolor** - integer surface color

4.3 CYLINDER

A cylinder shape.

obj = CYLINDER (base, h, r, scolor)

- **obj** - SHAPE object

- **base** - tuple (x, y, z) defining the base center

- **h** - height along z

- **r** - radius

- **scolor** - integer tuple $(s_{base}, s_{side}, s_{top})$of surface colors

4.4 CUBE

A cube shape.

obj = CUBE (corner, u, v, w, scolor)

- **obj** - SHAPE object

- **corner** - tuple (x, y, z) defining the minimum coordinate corner

- **u** - length along x

- **v** - length along y

- **w** - length along z

- **scolor** - integer tuple $(s_{xmin}, s_{ymax}, s_{zmin}, s_{xmax}, s_{ymax}, s_{zmax})$ of surface colors

4.5 POLYGON

A shape extruded from a polygon.

obj = POLYGON (polygon, h, scolor)

- **obj** - SHAPE object

- **polygon** - list $[(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)]$ of vertices defining a closed polygon in counter clock-wise order when looking down from a positive z point

- **h** - height along z

- **scolor** - integer tuple $(s_{base}, s_1, s_2, ..., s_n, s_{top})$ of surface colors

4.6 COPY

Copy shape.

obj = COPY (shape)

- **obj** - SHAPE object

- **shape** - input SHAPE

4.7 UNION

Set theoretic union of two shapes.

obj = UNION (shape1, shape2)

- **obj** - SHAPE object
- **shape1** - first input SHAPE object
- **shape2** - second input SHAPE object

4.8 INTERSECTION

Set theoretic intersection of two shapes.

obj = INTERSECTION (shape1, shape2)

- **obj** - SHAPE object
- **shape1** - first input SHAPE object
- **shape2** - second input SHAPE object

4.9 DIFFERENCE

Set theoretic difference of two shapes.

obj = DIFFERENCE (shape1, shape2)

- **obj** - SHAPE object
- **shape1** - first input SHAPE object
- **shape2** - second input SHAPE object

4.10 MOVE

Move shape linearly.

MOVE (shape, vector)

- **shape** - input SHAPE object
- **vector** - tuple (u, v, w) defining the translation

4.11 ROTATE

Rotate shape about an axis.

ROTATE (shape, point, vector, angle)

- **shape** - input SHAPE object

- **point** - tuple (x, y, z) defining axis point

- **vector** - tuple (u, v, w) defining axis direction

- **angle** - oriented angle in degrees

4.12   SOLID

A solid is created in a simulation.

obj = SOLID (simu, shape | label, grid)

- **obj** - SOLID object

- **simu** - simulation in which the solid is created

- **shape** - solid shape

- **label** - solid label (default: none)

- **grid** - maximal finite element grid size for this solid (default: none)

Chapter 5

Output

Chapter 6

Viewer

Chapter 7

Tutorials

Chapter 8

Theory