

# FLAC3D Repository



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# 1

## Using Python with FLAC3D

### 1.1 Geometry, Grid, Zone

The `itasca` module defines functions and classes for interaction between Python and FLAC3D.

```
"""  
  
import itasca as it  
it.command("python-reset-state false")  
"""
```

The `it.command` function is used to issue a series of FLAC3D commands.

The `it.zone.count` function creates 1000 zones

```
"""  
  
it.zone.count() # outputs 1000  
"""
```

The `it.zone.find(1)` returns a Zone object with id 1. The object is assigned to the Python variable `z`.

## 1. Using Python with FLAC3D

```
"""
z = it.zone.find(1)
print z # outputs <itasca.zone.Zone object at 0x00000001B388600, ID : 1>
z.pos() # outputs vec3(( 5.00000e-01, 5.00000e-01, 5.00000e-01))
"""
```

The variable *z* is a Zone object (FLAC3D zone)

*pos* method of this object returns the zone centroid.

*for* statement is used to iterate over sequences of things, Loop over all FLAC3D zones.

```
"""
volume_sum = 0.0
for z in it.zone.list():
    volume_sum += z.vol()
"""
```

Check that the sum of the zone volumes is what we expect.

```
"""
print volume_sum # outputs 1000.0
print z.vol() * it.zone.count()
assert volume_sum == z.vol() * it.zone.count() # outputs 1000.0
"""
```

Let's find a zone near the center of the model

```
"""
z = it.zone.near ((5,5,5))
#confirm position with pos method
z.pos() # outputs vec3(( 4.500000e+00, 4.500000e+00, 4.500000e+00))
"""
```

## 1. *Using Python with FLAC3D*

### 1.2 Group, Range

```
"""
```

```
"""
```

### 1.3 Constitutive Model

### 1.4 B.C. and I.C.

### 1.5 Step to Equilibrium

### 1.6 Support, Structure, Restore

### 1.7 Plot

# 2

## Illustrative Model – Mechanics of **FLAC3D**

**2.1 Geometry, Grid, Zone**

**2.2 Group, Range**

**2.3 Constitutive Model**

**2.4 B.C. and I.C.**

**2.5 Step to Equilibrium**

**2.6 Support, Structure, Restore**

**2.7 Plot**

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# Axial and Lateral Loading of a Concrete Pile

**3.1 Geometry, Grid, Zone**

**3.2 Group, Range**

**3.3 Constitutive Model**

**3.4 B.C. and I.C.**

**3.5 Step to Equilibrium**

**3.6 Support, Structure, Restore**

**3.7 Plot**

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# Smooth Circular Footing on an Associated Mohr-Coulomb Material

## 4.1 Geometry, Grid, Zone

## 4.2 Group, Range

## 4.3 Constitutive Model

## 4.4 B.C. and I.C.

## 4.5 Step to Equilibrium

## 4.6 Support, Structure, Restore

## 4.7 Plot