

# My Private FLAC3D Repository



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Working with **FISH** in **FLAC3D**

# 2

## Using Python with FLAC3D

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### 2.1 Geometry, Grid, Zone

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

## 2. Using Python with 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`.

```
"""  
  
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.

## 2. Using Python with FLAC3D

```
"""  
  
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))  
"""
```

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

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*3. Illustrative Model – Mechanics of FLAC3D*

**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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*4. Axial and Lateral Loading of a Concrete Pile*

**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**

# 5

## Smooth Circular Footing on an Associated Mohr-Coulomb Material

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*5. Smooth Circular Footing on an Associated Mohr-Coulomb Material*

**5.1 Geometry, Grid, Zone**

**5.2 Group, Range**

**5.3 Constitutive Model**

**5.4 B.C. and I.C.**

**5.5 Step to Equilibrium**

**5.6 Support, Structure, Restore**

**5.7 Plot**