Geometric & Graphics Programming Lab: Lecture 4

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1. Workshop N.1

Workshop N.1

Simple parametric building structure in reinforced concrete

- Space frame of reinforced concrete
- including beams, pillars and footings
- using few `pyplasm` primitive operations
- parameterized by:
  - `(bx,bz)` (given dimensions of beam section)
  - `(px,py)` (given dimensions of pillar section)
  - `[dy1,dy2,...]` (distances between axes of the pillars)
  - `[hz1,hz2,...]` (interstory heights)

Sketch of object shape

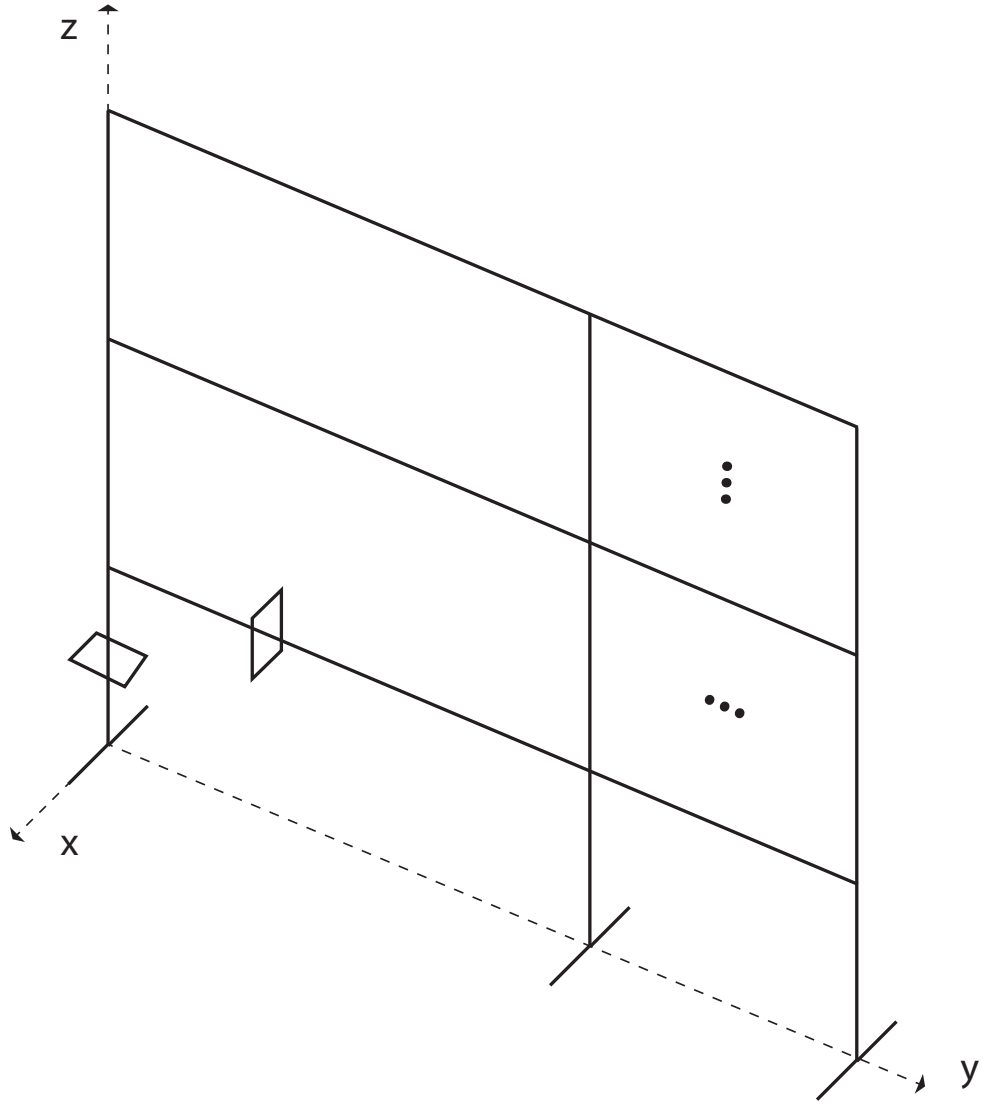

Figure 1:

Hint: solution 1

Use `pyplasm` primitives `QUOTE` (to produce 1D cell complexes) and `PROD` for Cartesian product of cell complexes (HPC values)

```
x = [.1,-.05,.001,-.05]
a = QUOTE(x*5)
aa = PROD([a,a])
aaa = PROD([aa,a])
VIEW(aaa)
```

Hint: solution 2

Use `pyplasm` primitives `CUBOID` (to produce 3D cuboidal cells), `T()()` for translations, and `STRUCT` (for assembly of cell complexes) to create structures of HPC values

```
b = CUBOID([1,2,3])
d = STRUCT([b,T(1)(4.0),b])
VIEW(d)
```

Style specs

- produce a single Python function, with real or integer or list parameters
- output: a single HPC value
- use meaningfull identificators (variables and parameters)
- use camelCase ids
- add Python `docstrings` (google for it)
- produce a single Python file, named workshop_01.py
- file path: `your_repo/2016-10-14/workshop_01.py`

Minimal git/github instructions (1/2)

create your local repository

```
$ mkdir development
$ cd development
$ git clone https://github.com/your-account/ggpl
$ cd ggpl
$ mkdir 2016-10-14
$ cd 2016-10-14
$ touch workshop_01.py
```

Minimal git/github instructions (2/2)

commit your work

```
$ git add -A .
$ git commit -m "add a short note to commit"
$ git push origin master
```

look to your GitHub repository and check

Assignment for next Friday

1. Install Jupyter
2. see tutorial
3. play with it