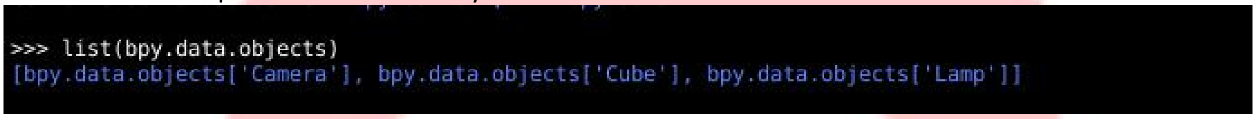
e-Yantra Robotics Competition (eYRC-2017)
Task 1 – Transporter Bot

We will now see the next sub module in BPY which is bpy.data. This module is used for all blender/python access. Python accesses Blender’s data in the same way as the animation system and user interface; this implies that any setting that can be changed via a button can also be changed from Python.

Accessing data from the currently loaded blend file is done with the module bpy.data. This gives access to library data.

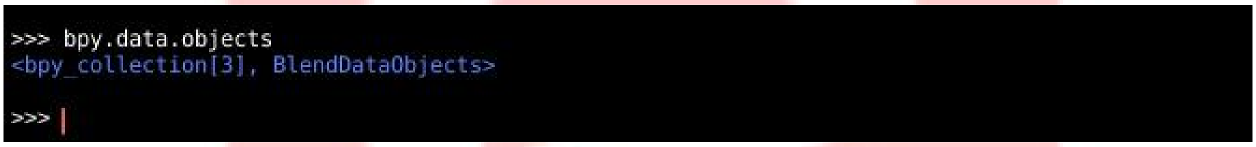
For example:

1. **list(bpy.data.objects):** Lists the number of objects in 3D window. In our case its Camera, a Cube and a Lamp which is available by default.



```
>>> list(bpy.data.objects)
[bpy.data.objects['Camera'], bpy.data.objects['Cube'], bpy.data.objects['Lamp']]
```

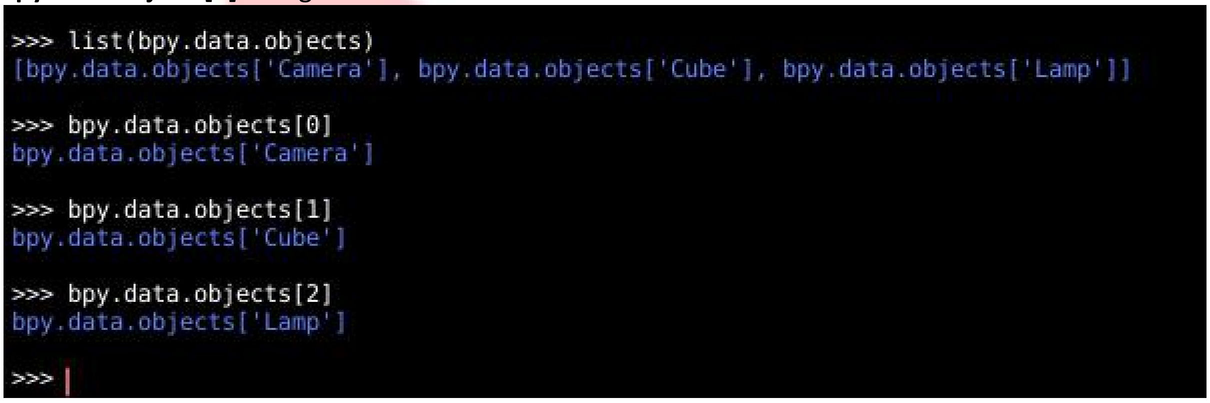
2. **bpy.data.objects:** Gives you the count of objects in the 3D window.



```
>>> bpy.data.objects
<bpy_collection[3], BlendDataObjects>

>>> |
```

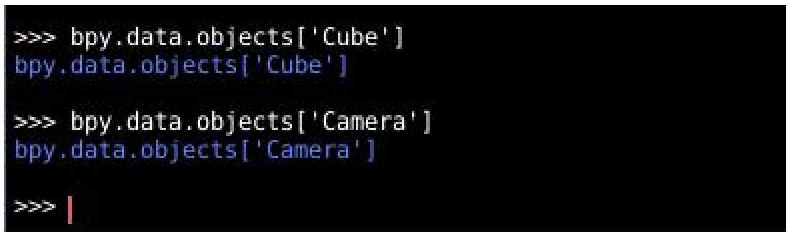
Similarly, **bpy.data.scenes** and **bpy.data.materials** will give you the count of scenes and materials used respectively.

To access members of the collection, you can use an index as well as a string of the collection.
For e.g. When **list(bpy.data.objects)** was entered it listed the objects in a sequence: Camera, Cube and then Lamp.
If you want to access the object by its index, you can simply write
bpy.data.objects[1] will give Cube.



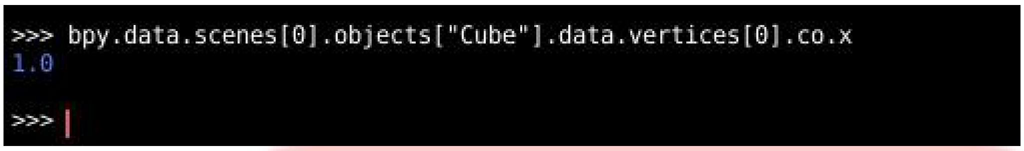
```
>>> list(bpy.data.objects)
[bpy.data.objects['Camera'], bpy.data.objects['Cube'], bpy.data.objects['Lamp']]

>>> bpy.data.objects[0]
bpy.data.objects['Camera']

>>> bpy.data.objects[1]
bpy.data.objects['Cube']

>>> bpy.data.objects[2]
bpy.data.objects['Lamp']

>>> |
```

And if you want to access the object by its name, then
bpy.data.objects[‘Cube’]



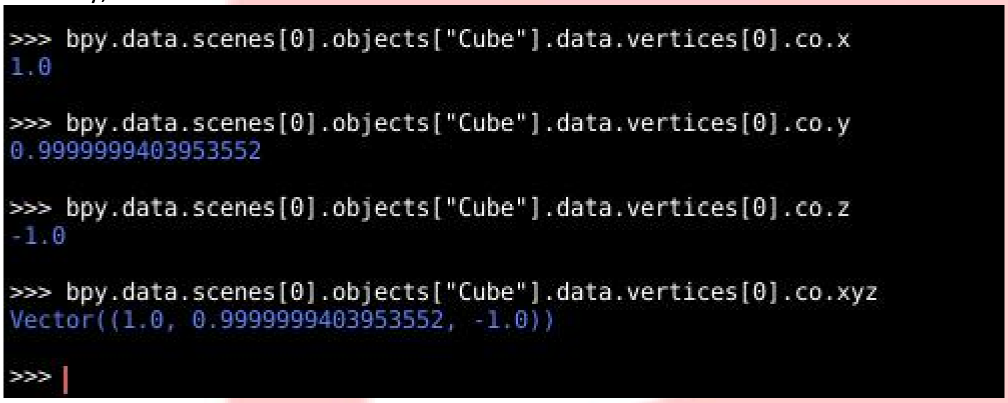
```
>>> bpy.data.objects['Cube']
bpy.data.objects['Cube']

>>> bpy.data.objects['Camera']
bpy.data.objects['Camera']

>>> |
```

3. **bpy.data.scenes[0].objects["Cube"].data.vertices[0].co.x**: Give the location of the object in x axis



```
>>> bpy.data.scenes[0].objects["Cube"].data.vertices[0].co.x
1.0

>>> |
```

Similarly,



```
>>> bpy.data.scenes[0].objects["Cube"].data.vertices[0].co.x
1.0

>>> bpy.data.scenes[0].objects["Cube"].data.vertices[0].co.y
0.9999999403953552

>>> bpy.data.scenes[0].objects["Cube"].data.vertices[0].co.z
-1.0

>>> bpy.data.scenes[0].objects["Cube"].data.vertices[0].co.xyz
Vector((1.0, 0.9999999403953552, -1.0))

>>> |
```

#Code to make trapezium out of default cube

```
import bpy
bpy.data.objects["Cube"].data.vertices[0].co.x += 1.0
bpy.data.objects["Cube"].data.vertices[0].co.x += 1.0
bpy.data.objects["Cube"].data.vertices[1].co.x += 1.0
bpy.data.objects["Cube"].data.vertices[1].co.x += 1.0
bpy.data.objects["Cube"].data.vertices[2].co.x -= 1.0
bpy.data.objects["Cube"].data.vertices[2].co.x -= 1.0
bpy.data.objects["Cube"].data.vertices[3].co.x -= 1.0
bpy.data.objects["Cube"].data.vertices[3].co.x -= 1.0
```