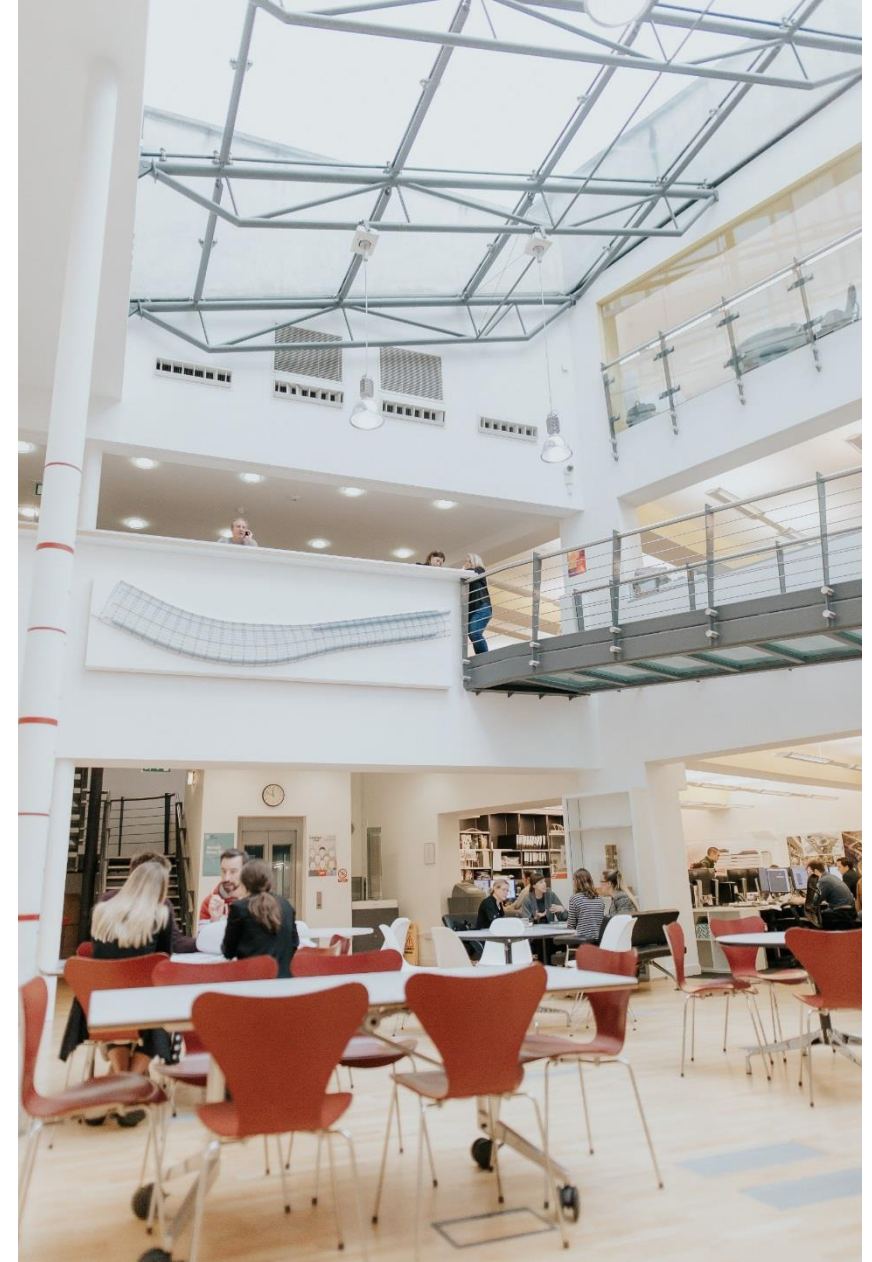# GRIMSHAW

UK Dynamo User Group | South

Welcome

Welcome to Grimshaw's London office.

Ground rules :

› If fire alarm sounds, please leave the building via the stairs behind the screen.
› Please take any seat and get cosy

You are encouraged to :

› take photos
› tweet and update social media
› please ensure device is on silent

UK Dynamo User Group | South

Happy birthday

UK Dynamo User Group | South

Committee

Aaron Perry
BIM Manager
AHMM

Michael Hudson
Associate Director
Flanagan Lawrence

Martin Coyne
BIM Manager &
Associate Principal
KPF

Mike Turpin
Head of BIM
Capita

Radu Gidei
BIM Manager
Grimshaw

UK Dynamo User Group | South

Updates

2017 south meetings
> 24th May 2017
> 28th February 2017

2016 south meetings
> 29th November
> 26th July
> 13th April

UK Dynamo User Group | South

Updates

Event format

We've been experimenting with the event format :
› skill-based breakouts
› topic-based breakouts
› presentation-based breakouts
› tips and tricks session

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Updates

New website coming soon

Use our current contact page to send us :

› feedback
› comments
› suggestions

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Updates

Live streaming

Tonight we're experimenting with
live-streaming on the internet, to reach
our community members who are :

› on the waitlist
› remote

https://grimshaw.zoom.us/j/814967999

GRIMSHAW

Session 1

Modelling from Point cloud & solving everyday inefficiencies

James Still + Chris Veloso
Plowman Craven Surveyors

GRIMSHAW

Session 2

Designing Buildings/ Managing Space: Integrating Room Data,

creating Spatial Diagrams and developing Building Form

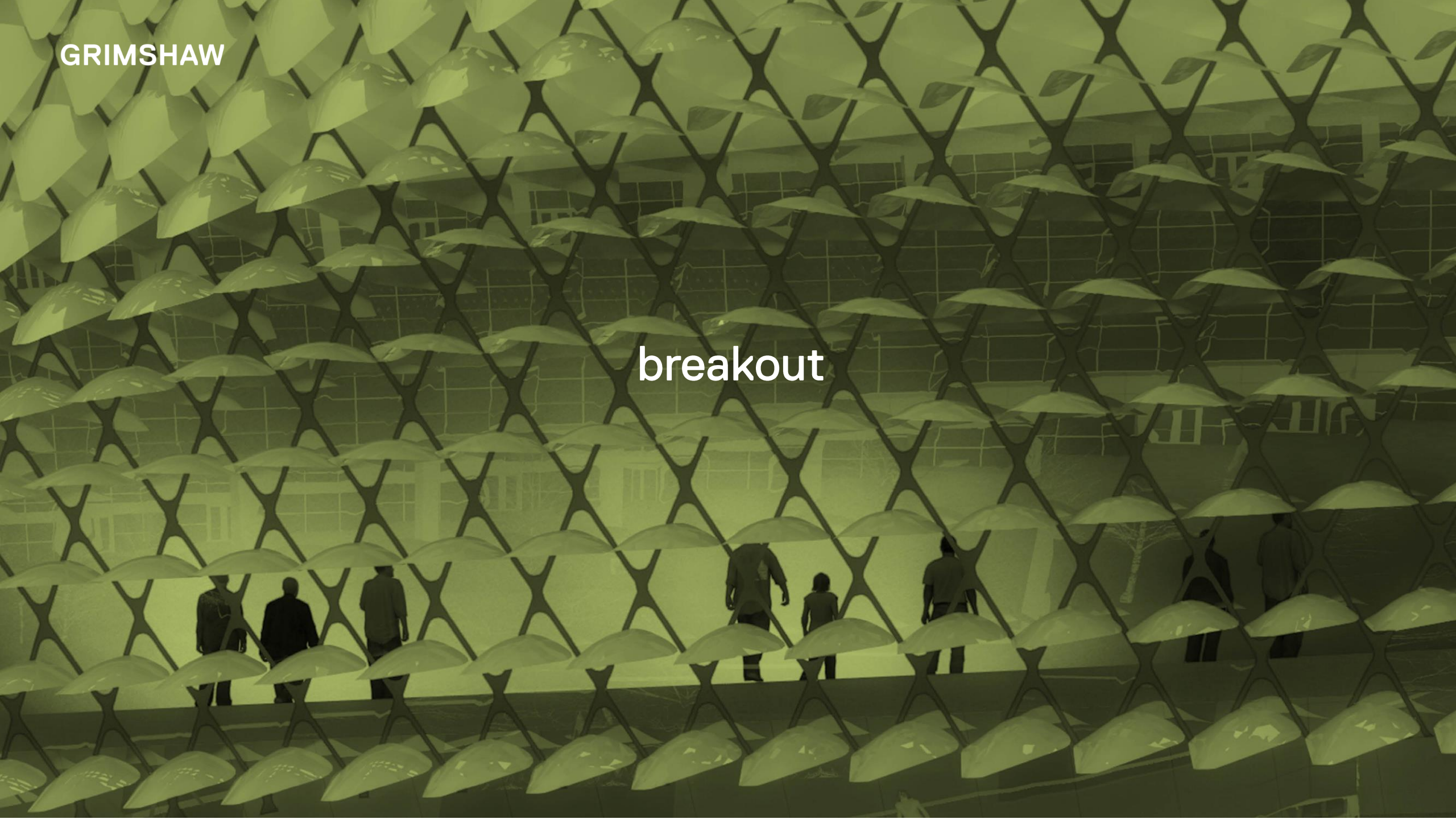Ian Atkins + Kong Hoang
Heatherwick

GRIMSHAW

Session 3

Dynamo | Macros | Addins

Deyan Nenov
Archilizer

GRIMSHAW

breakout

Breakout sessions

Split into 4 groups, one for each presentation topic :

> MR1 : Point clouds
> MR2 : Space, Design & Building form
> MR3 : Dynamo, Macros, Addins, Languages
> MR4 : Tips & tricks

We will have 40(ish) minutes to discuss each topic in-depth

At the end, gather in the atrium for
> summary of each group's findings
> feedback and suggestions for next meeting
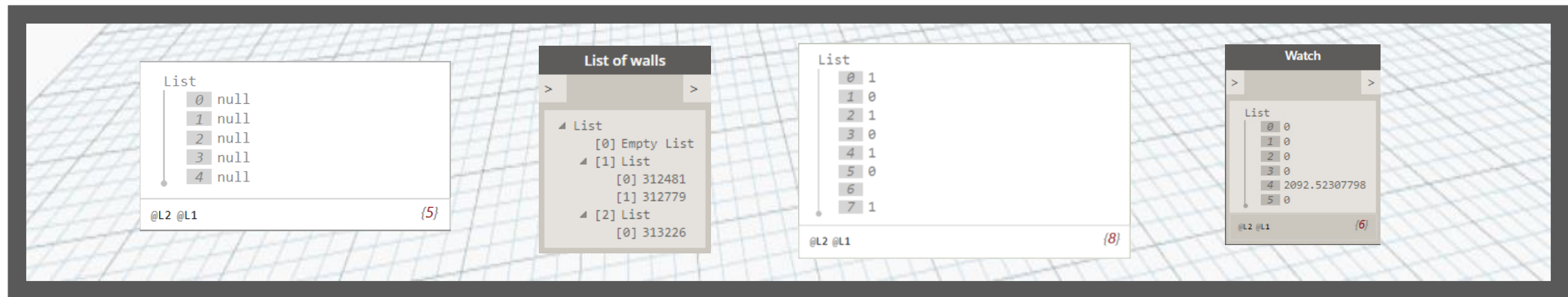
GRIMSHAW

Session 4

Tips & tricks

UK Dynamo User Group committee
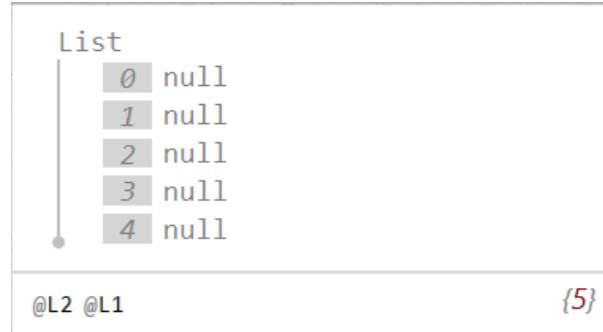
4 ways to achieve "Nothing"

There are many ways to achieve "nothing" in Dynamo.

Often, this indicates some kind of failure. It is helpful to recognise the various kinds of "nothing" Dynamo can return, to help diagnose and resolve the problem.

4 ways to achieve "Nothing"

NULL

The 'null' type represents the absence of data.

If an action doesn't create a valid result, the Node will return a null.

The node is unable to perform some action - a "non-starter."

Remedy: Try reconsidering what you're doing. What action does this node perform?

Did you plug a valid data type into this node? Be specific about the data types being input.

Is a complex list structure getting in the way? Try List at Level to access data buried in multiple nested lists.

Further Reading: https://www.codeproject.com/Articles/1187369/The-meaning-of-null

4 ways to achieve "Nothing"

EMPTY LIST

Empty lists happen when a node has a set number of output lists, but doesn't populate all of them for some reason. For instance, a FilterByBoolMask node fed with all 'true' values will automatically also create a list for 'false' values, which will be empty.

Dynamo is saying "I'm gonna create these lists anyway, I just don't have anything to put in some of them"
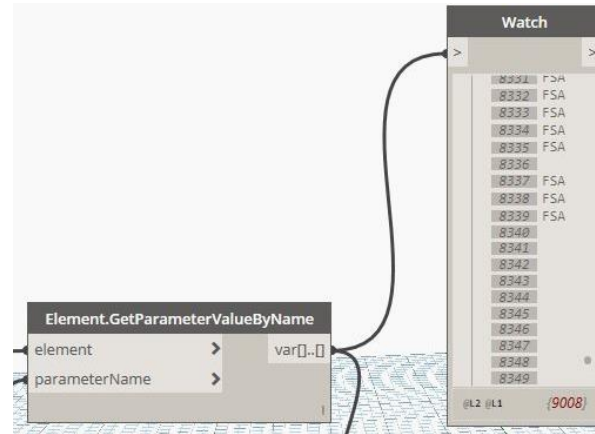
Remedy: Look at the function the node is performing. Perhaps an empty list is correct behaviour, as in the above example.
Feed it some test data to try and populate all of the lists.
If you can't populate the lists with dummy data, reinvestigate what this node is doing.

4 ways to achieve "Nothing"

"   " (BLANK)

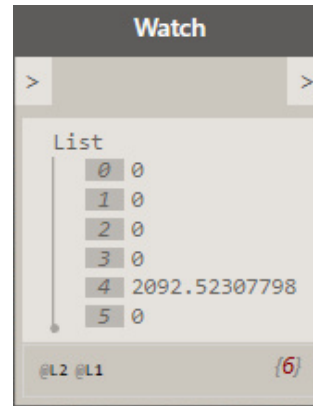A blank value is a string of length 0 characters.
For instance this may occur when trying to read a parameter which doesn't exist in an element.
Instead, Dynamo shrugs its shoulders and returns a blank string.

Remedy: Try testing the same definition on some dummy data or a Revit sample project.
If trying to read a parameter, use Element.Parameters node to check whether that parameter exists for this element.

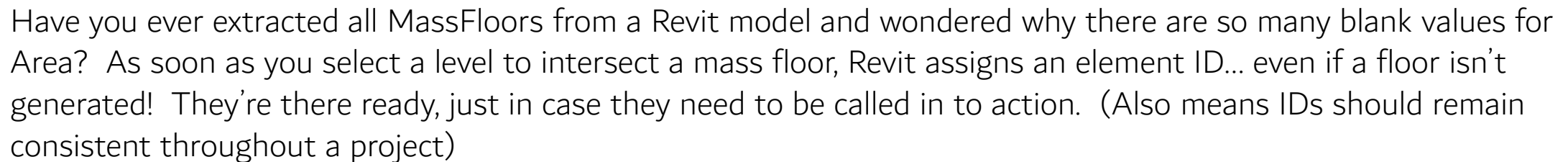# 4 ways to achieve "Nothing"

0 (zero)

The simplest of all, a number value of zero. You're in luck; this is valid! However, it can take many forms:
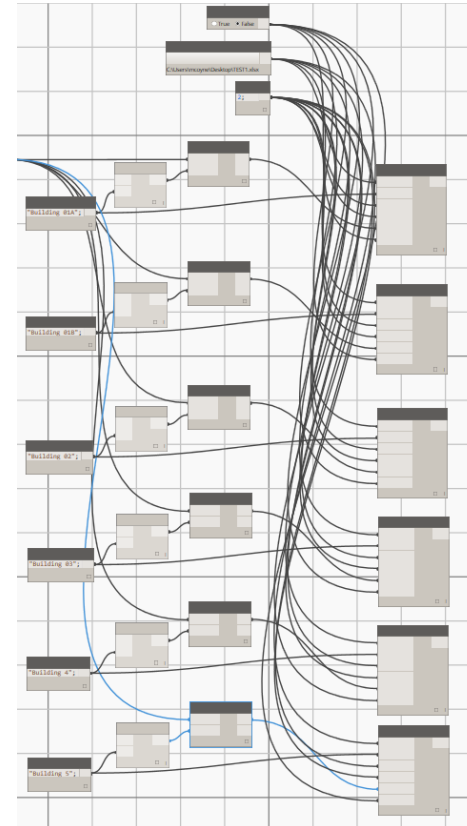It can be an integer, a rounded double or (sometimes*) a Boolean value.

Remedy: None needed!

(*Revit + Dynamo use 3 different ways to understand boolean data: true & false, yes & no, 1 & 0.
Revit also uses a fourth – the ticked & unticked box.)

When is a floor not a floor?

Have you ever extracted all MassFloors from a Revit model and wondered why there are so many blank values for Area? As soon as you select a level to intersect a mass floor, Revit assigns an element ID... even if a floor isn't generated! They're there ready, just in case they need to be called in to action. (Also means IDs should remain consistent throughout a project)

Remedy: Use a bool mask to filter out the unnecessary and non-existent floors, it makes life a lot easier!
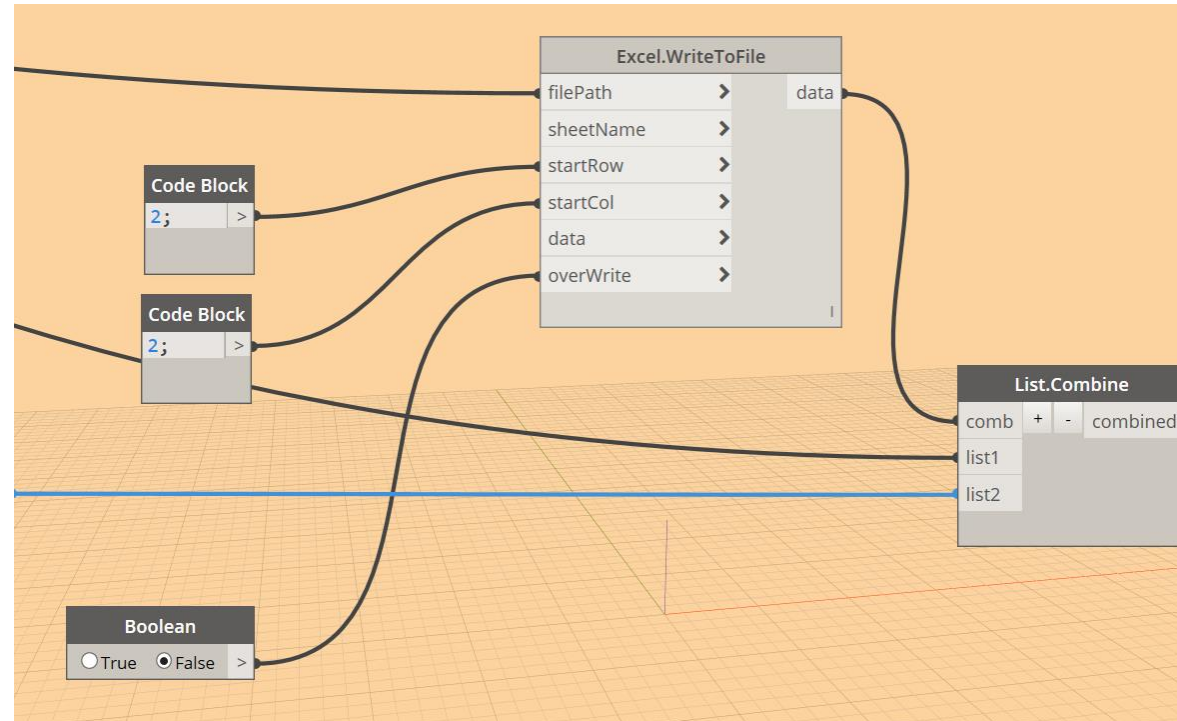
Save yourself from spaghetti

Have you seen a definition like this before…?

Nodes that didn't allow an array as an input so the node has been repeated… many, many times?!

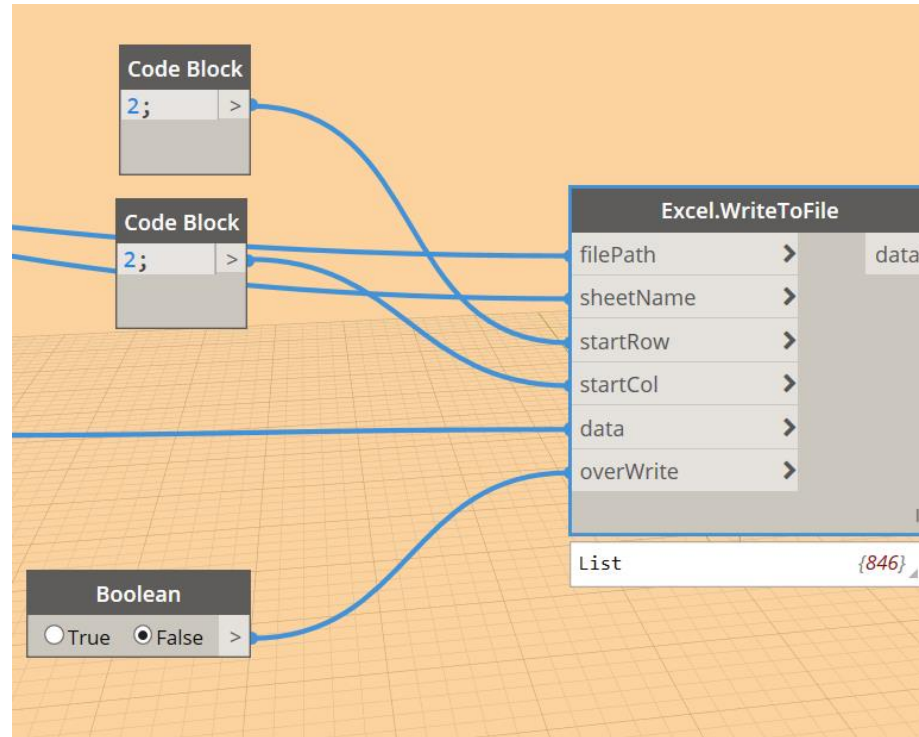Excel.WriteToFile was a prime example

Save yourself from spaghetti

There was a solution!

Remedy #1: Use List.Combine! Feed any fixed values in to the original node, i.e. file path, Boolean toggles, etc. then feed any variable element arrays in to the List.Combine node… the input order corresponds with any empty inputs on the primary node
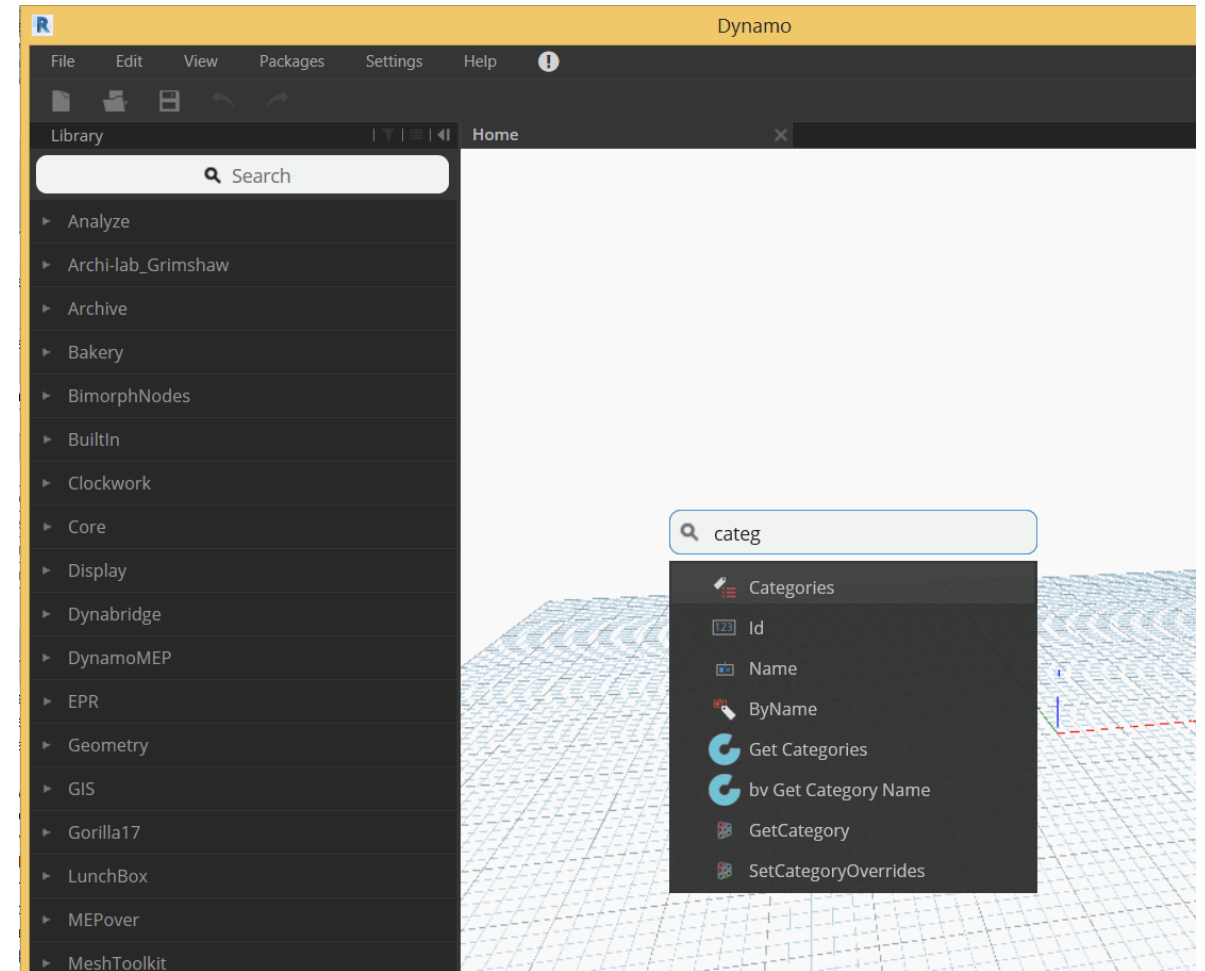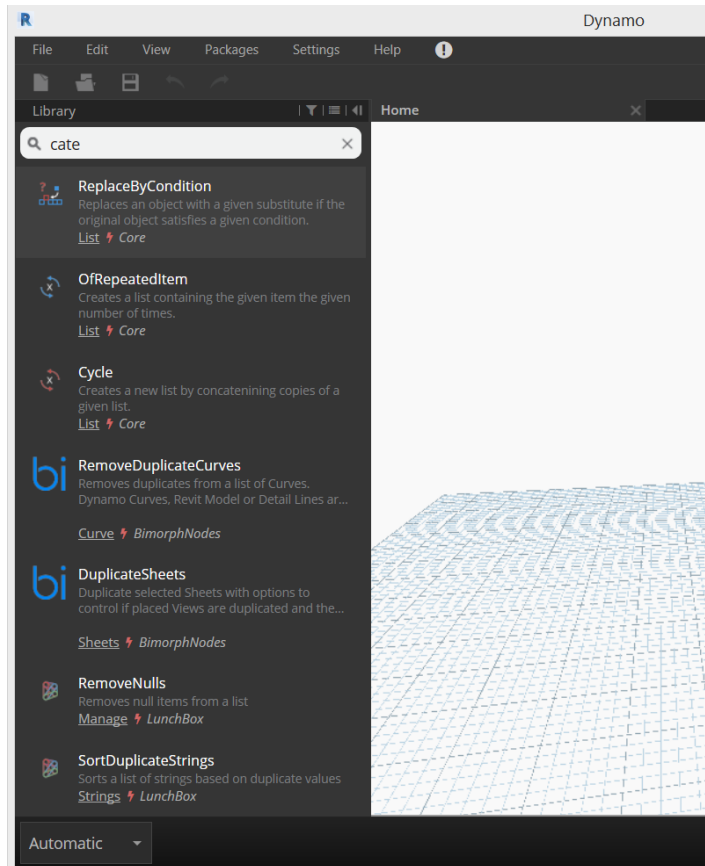
Save yourself from spaghetti

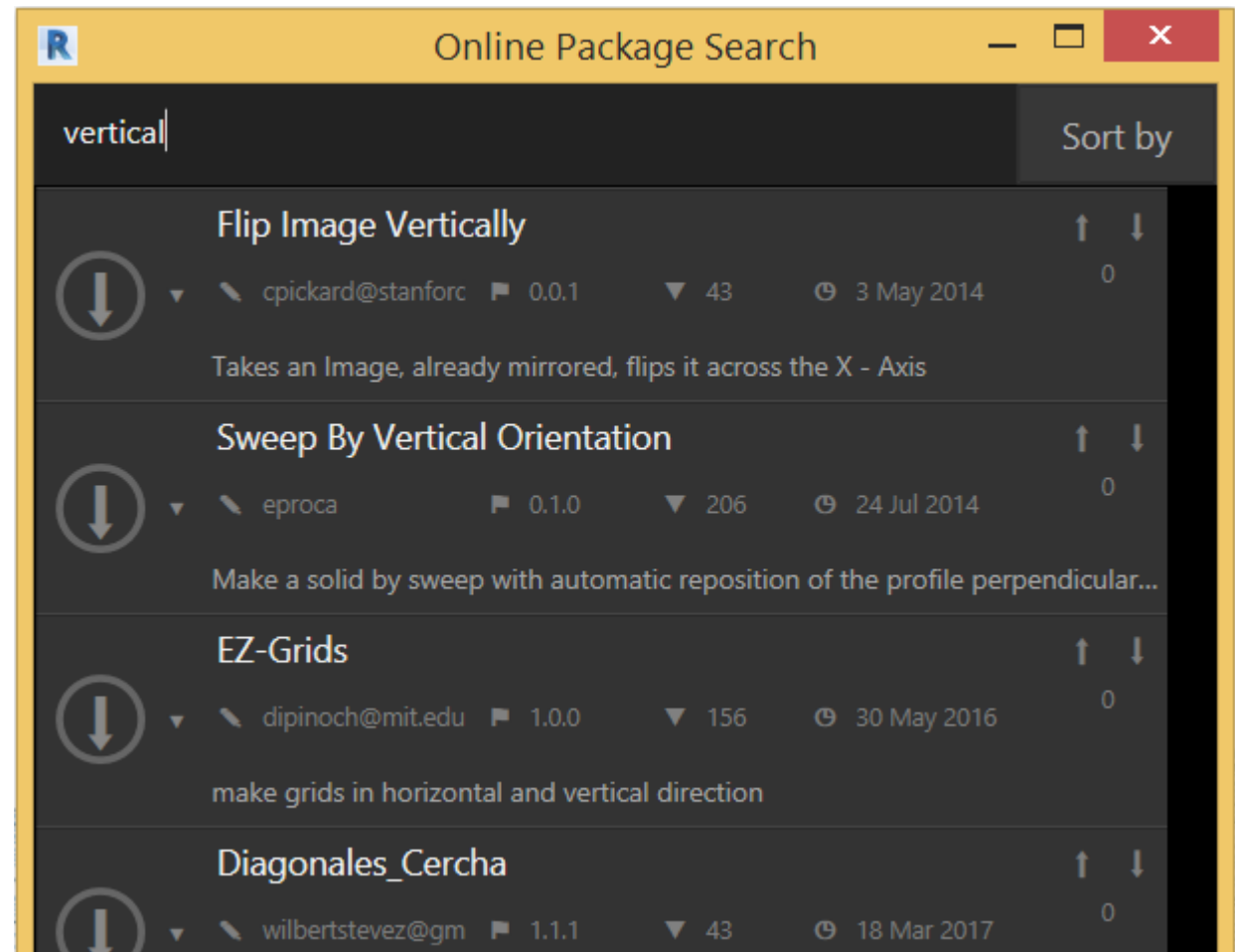There's now an even better solution!

Remedy #2: Upgrade – the issue is now fixed for many nodes!
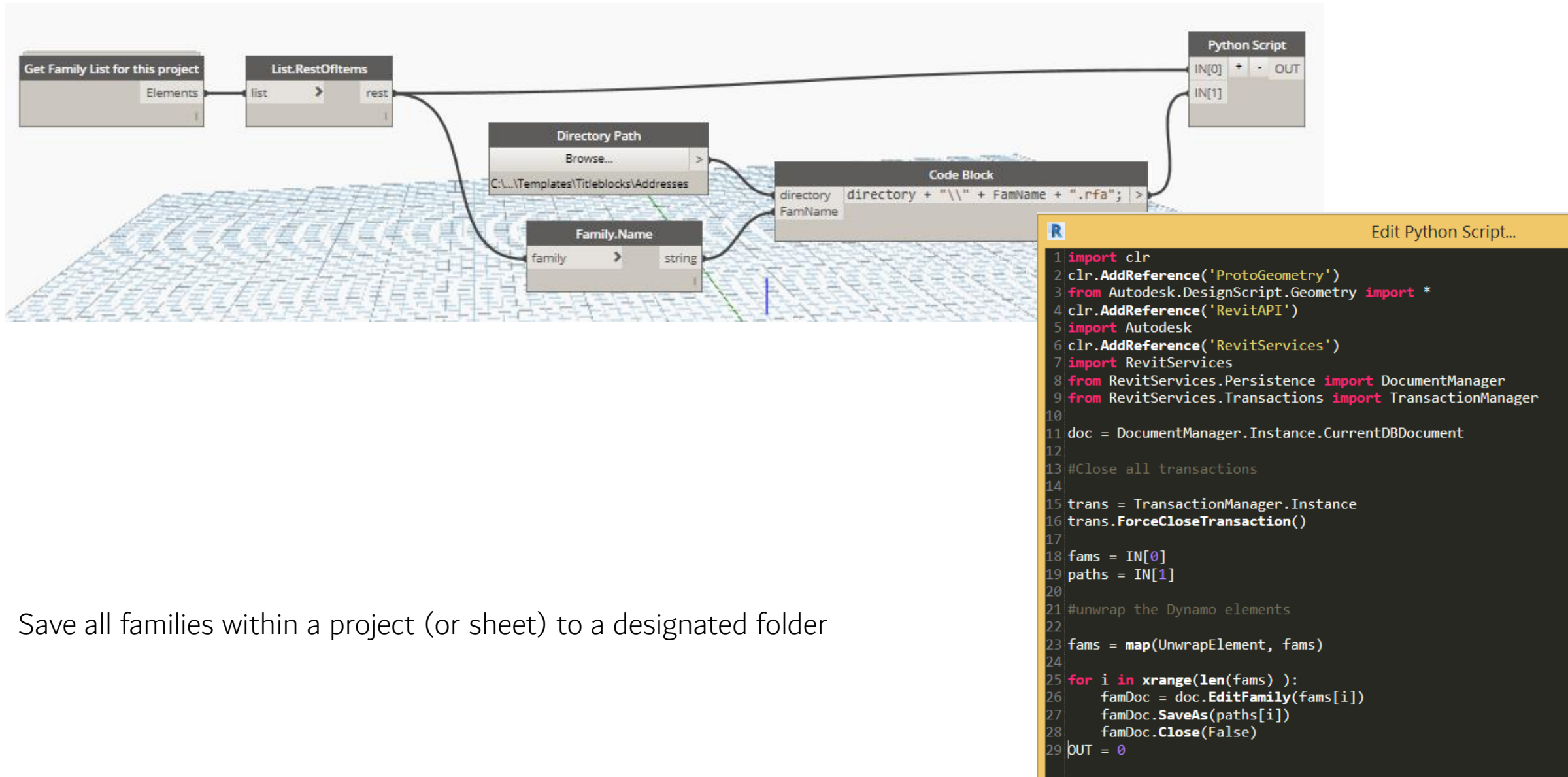
Speed up searches

Right click anywhere in window to search rather than using search bar on right.

Searching for Packages

Don't just search by package name, can also search for what you are trying to do.

Save all families

Save all families within a project (or sheet) to a designated folder

```python
import clr
clr.AddReference('ProtoGeometry')
from Autodesk.DesignScript.Geometry import *
clr.AddReference('RevitAPI')
import Autodesk
clr.AddReference('RevitServices')
import RevitServices
from RevitServices.Persistence import DocumentManager
from RevitServices.Transactions import TransactionManager

doc = DocumentManager.Instance.CurrentDBDocument

#Close all transactions

trans = TransactionManager.Instance
trans.ForceCloseTransaction()

fams = IN[0]
paths = IN[1]

#unwrap the Dynamo elements

fams = map(UnwrapElement, fams)

for i in xrange(len(fams) ):
    famDoc = doc.EditFamily(fams[i])
    famDoc.SaveAs(paths[i])
    famDoc.Close(False)
OUT = 0
```

Ask the community!

There's a whole group of UKDUG users, make use of it!

Command-line interface

Dynamo includes a command-line interface that you can use to :

> Automate many Dynamo runs
> Test Dynamo Graphs
> Run a sequence of Dynamo graphs in a specific order
> Write batch files that run multiple command line executions
> Write another program to control and automate the running of Dynamo graphs and do cool things with the results of those computations

Command-line interface

How ?

Run the following command in your terminal (Mac) or CMD window (Windows) :

C:\Program Files\Dynamo\Dynamo Core\1.3\DynamoCLI.exe -o "T:\ RandomRange.Dyn"

```
C:\Program Files\Dynamo\Dynamo Core\1.3>DynamoCLI.exe -o "T:\RandomRange.Dyn"
loaded file
```

Command-line interface

Options

You can specify the output of the graph to be routed to an XML file :

C:\Program Files\Dynamo\Dynamo Core\1.3\DynamoCLI.exe -o "T:\RandomRange.Dyn" -v "T:\output.xml"

```
C:\Program Files\Dynamo\Dynamo Core\1.3>DynamoCLI.exe -o "T:\RandomRange.Dyn" -v "T:\output.xml"
loaded file
```

Command-line interface

Options

Output contains each
Dynamo evaluation and
each node output value

Nothing is output to
screen, but you can write
to files as part of the
Dynamo of graph.

```xml
output.xml

1  <evaluations>
2    <evaluation0>
3      <Node guid="c330e031-812d-4eb1-b71d-d70b45b650d2">
4        <output0 value="15" />
5      </Node>
6      <Node guid="d44f7d7f-3598-438d-9960-01f42e841aaa">
7        <output0 value="65" />
8      </Node>
9      <Node guid="71916e00-e32a-4b49-8a8c-3b0cf3374f9c">
10       <output0 value="null" />
11     </Node>
12     <Node guid="8d4fb397-8df8-416e-9497-cc71e2fa046d">
13       <output0 value="T:\test.csv" />
14     </Node>
15     <Node guid="922978f5-2845-4278-bea2-c19118c37379">
16       <output0 value="98" />
17     </Node>
18     <Node guid="f22ced33-2e43-4483-aeb0-cdb70ace65de">
19       <output0 value="05/24/2017 15:51:33" />
20     </Node>
21     <Node guid="6106f02d-26c0-4d05-a7e5-f2574c0f3cac">
22       <output0 value="{05/24/2017 15:51:33,22.4855471226439,18.887286023295,19.8823040556301,24.8982295883903,35.4653776454706,20.1349864674982,44.09
         90146553871,60.5470269443164,20.0459370225551,52.0808711410223,43.342156613993,63.644562797702,54.5089298018887,23.7208247833465,29.68261323644
         78,32.7275489215068,23.1037016069,15.0267691614578,60.4163071215861,60.0638390872909,43.4294251267307,35.1042785449696,49.795204875507,40.56740
         18507329,36.53092564179,17.1769600981175,64.9730830934289,33.1587290813062,33.3757389169681,27.955141376016,28.3210898934048,25.471480066036,43
         .1605413122117,65,58.2463667491141,45.959469605033,50.8852663666566,36.982429307564,39.9461435216919,15.1147690198375,22.0874739644629,18.11124
         87063573,48.7994513677046,54.0857451794891,58.9124268166049,60.5717387440746,55.396339736073,15,36.3770980532477,42.6523578460092,58.3624286486
         59,34.454986643678,29.9775132401822,56.5577995541911,64.2323034396508,54.5081669327277,36.2189795028415,46.4418005599507,55.4942023016537,32.93
         76091896808,22.2888017291228,25.5894772164086,41.8204796696759,59.2176940015925,38.4089728899452,32.5198681902846,35.1332131278179,56.635828156
         9422,32.6013563892859,50.8500419864683,48.9691809099037,53.2481706543895,42.2075239948193,59.9507297440762,52.6255567651556,39.9673680627011,53
         .4317255323185,62.8363580510714,48.7818733891815,43.0860852527689,28.907518717098,64.6222747357565,63.9085293831119,57.8502794260124,36.7196110
         824105,60.9930016047803,62.6208651809072,53.7296401130741,15.4168882026769,18.387391458714,24.3896817445191,19.0926574490336,48.
         6151253609638,21.6577259743388,59.9528656457682,63.6248951031078,43.4176673917348,56.7086557211655}" />
23     </Node>
24   </evaluation0>
25 </evaluations>
```

Future Speakers….

Dave Sewell – Perkins & Will – Datashapes

Deyan Marzev – AKTII – Dynamo for Structures

Davide Roth – Adamson Associates – Grouping & Scheduling

Tiago Costa Jorge – Maccreanor Lavington – Dynamo Workflows

YOU?!?

Sign up at www.ukdug.co.uk/speakers soon.

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