



REVIT PURE PRESENTS
PAMPHLETS



ISSUE #29 / SUMMER 2023

AUTO-NUMBERING



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by: Nicolas Catellier, Architect

PAMPHLETS COLLECTION



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WHAT IS THIS “PAMPHLET”?

Revit Pure Pamphlets are published 4 times a year by email. Each edition covers a particular Revit theme. We like to pick themes that are complex and confusing. Our job is to make these topics simple for you.

ABOUT AUTO-NUMBERING

This pamphlet uses Dynamo and plugins to renumber elements. The first example will be renumbering door mark values by using the “To Room” information.

The second example will teach you how to renumber furniture families by using both the level and the room.

You have no Dynamo experience? No worries, just read [Pamphlet #22](#). You can further expand your Dynamo knowledge by following our [MANAGE](#) course for Revit.

We include all steps to create the scripts by yourself. However, [MANAGE](#) course customers get access to all scripts.

Also, there is a video tutorial along with this pamphlet. [Watch here](#).

May the BIM be with you.

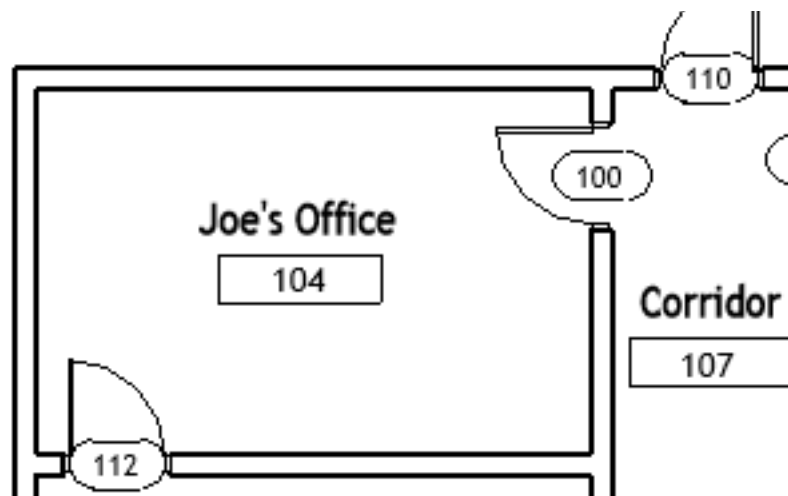


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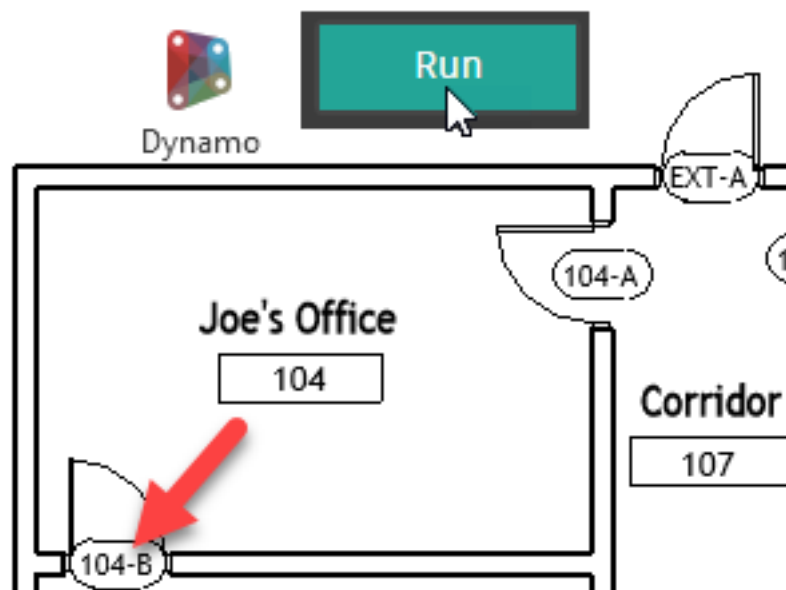
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SCRIPT #1 - RENUMBER DOORS BASED ON ROOMS

I have spent countless hours manually renumbering door mark values based on the room they are placed in. By using Dynamo, you can automate the process. In this example, we have doors with random mark values unrelated to the rooms.



After running the Dynamo script, the doors automatically acquire the "To Room" value and add a unique letter suffix.





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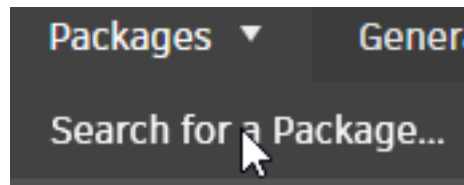
STEP #1- GET ALL DOORS

Use the following nodes to get all doors in the project:

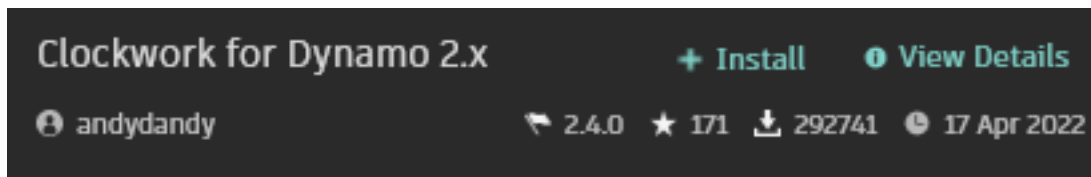


STEP #2- USE "DOOR.ROOMS" NODE FROM CLOCKWORK PACKAGE

You will need to install a custom package called Clockwork. In Dynamo, go to the Packages menu and **Search for a Package**.



Search for **Clockwork** and click on Install.



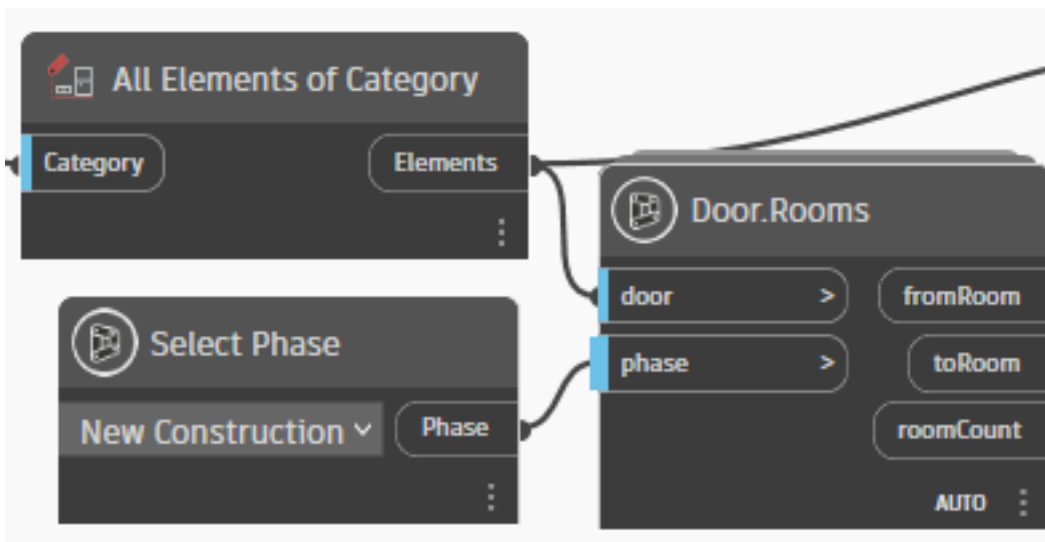


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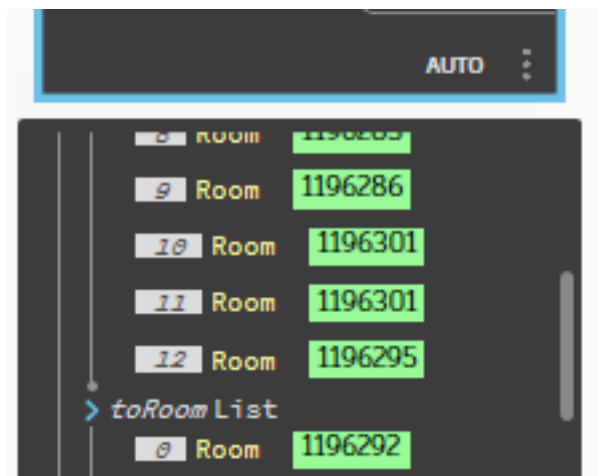
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The “toRoom” and “fromRoom” are not considered as parameters but as attributes. Regular “GetParameter” nodes don’t work to get the toRoom values. That’s why you must use the clockwork node.

Now, place the **Door.Rooms** node from that package. This node gives you the fromRoom and toRoom attributes for each doors. Plug in the node called **Select Phase** and pick a phase in the dropdown menu.



You can try to run the script. You will see a list of rooms.



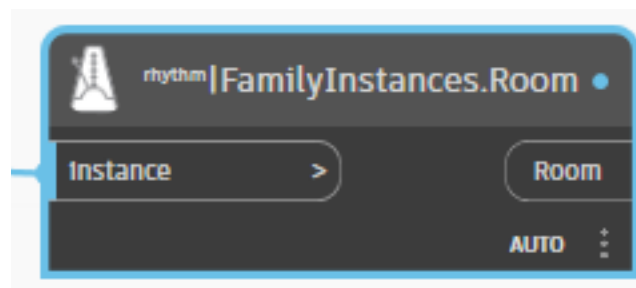


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ALTERNATIVE: USE RHYTHM PACKAGE NODE

An alternative to the Clockwork node is the **FamilyInstances.Room** node from the Rhythm package. When used with Doors as input, it will always return the toRoom value.



The Rhythm nodes are typically more stable than Clockwork because they are considered “no-touch nodes” coded with C# and don't rely on “dependencies”. This jargon means you are less likely to get errors on various versions of Revit and Dynamo.

STEP #4- USE THE LIST.GROUPBYKEY NODE

The List.GroupByKey node is one of the most powerful and helpful. It will group the doors based on the “toRoom” attribute.

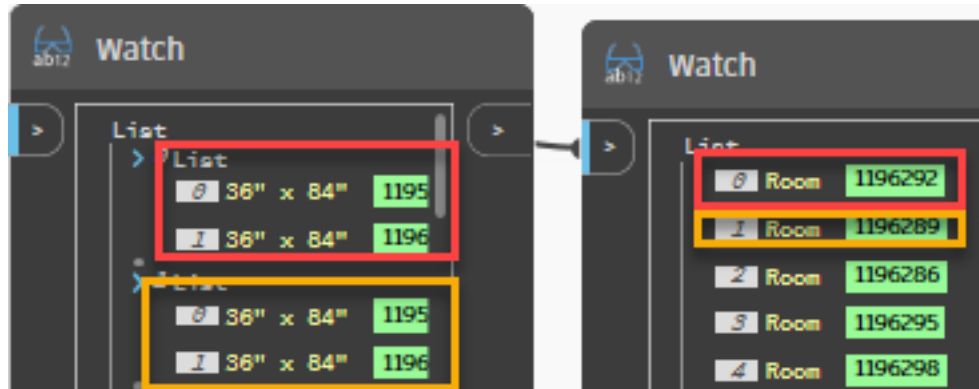




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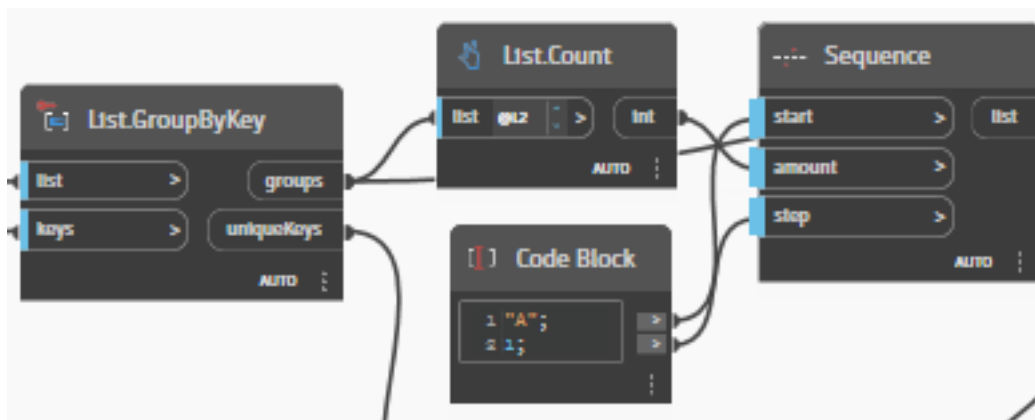
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You can see the output. On the left, the list of all doors. On the right, the list of all unique rooms. You know the first sublist contains all doors in unique room ID=1196292.



STEP #5- CREATE A UNIQUE SEQUENCE

Now, we need to generate numbers or letters that we'll assign to the door suffix. First, use the List.Count node set at @L2 to count the number of doors per room. Then, use the Sequence node and fill in the input. In the example below, we use letter A for the start, but you could also use a number.



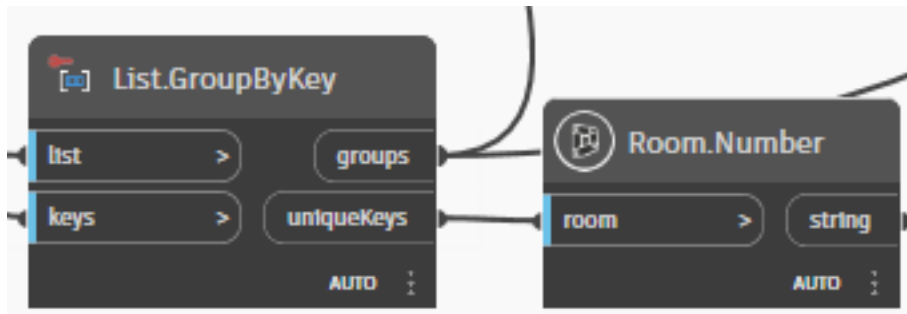


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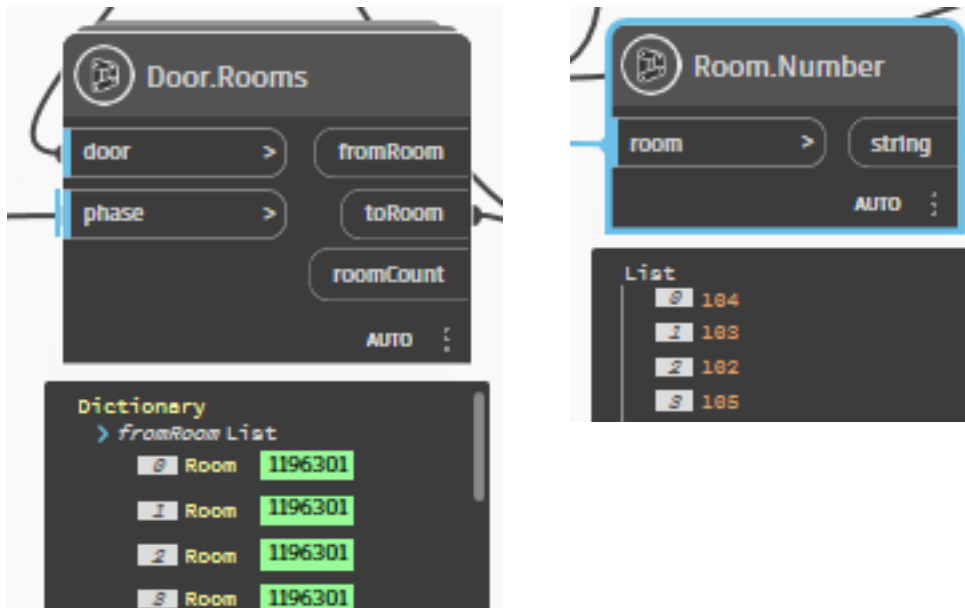
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STEP #6: CONVERT ROOM NUMBER TO STRINGS

The “Unique Keys” output of the Group node returns the room element. But we just need the number. Use the Room.Number node to extract the number in a string type. String means text in Dynamo.



On the left, you can see the original Room list (in yellow text). On the right, the room number in strings (orange).





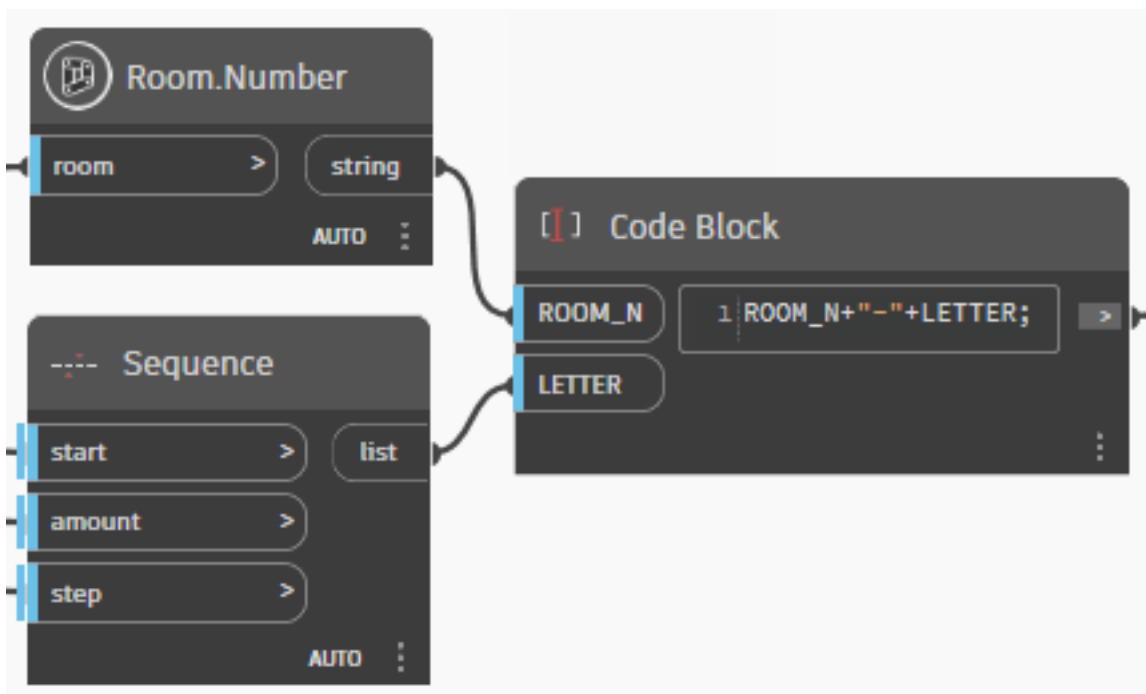
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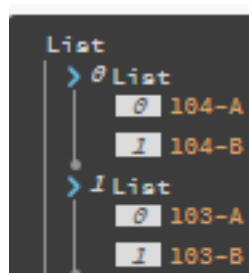
STEP #7: PUT TOGETHER THE UNIQUE MARK

There are multiple nodes to pad and concatenate a string value. But the easiest way is to use the **Code Block** node. You can create one by double-clicking on the screen.

You can create a variable by typing a text. Then, you can create a separator by putting text in between quotation marks. Here is the Code Block formula:



You get a list of these unique strings:



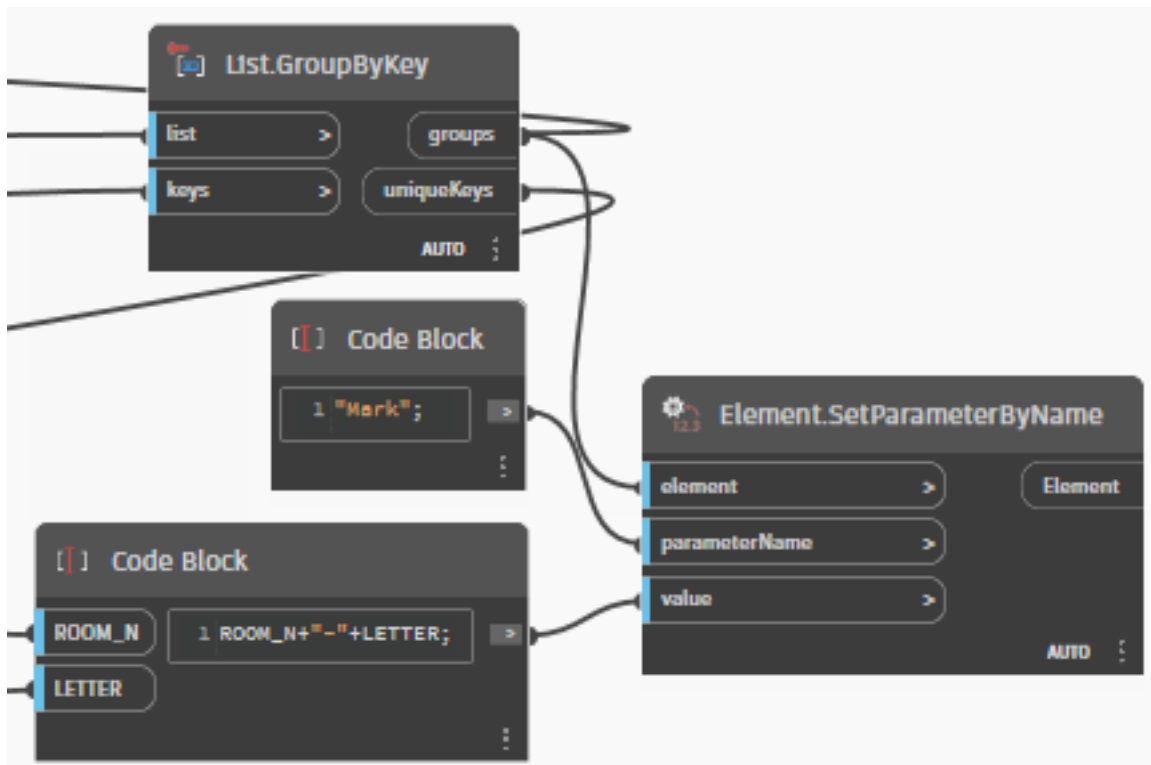


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STEP #8: SET PARAMETER VALUE BY NAME

Use the **Element.SetParameterByName** node. For the elements, plug in the “Groups” output from the **List.GroupByKey** node you’ve previously used. In this case, we set it to the Mark parameter, but you could use any instance parameter you want.



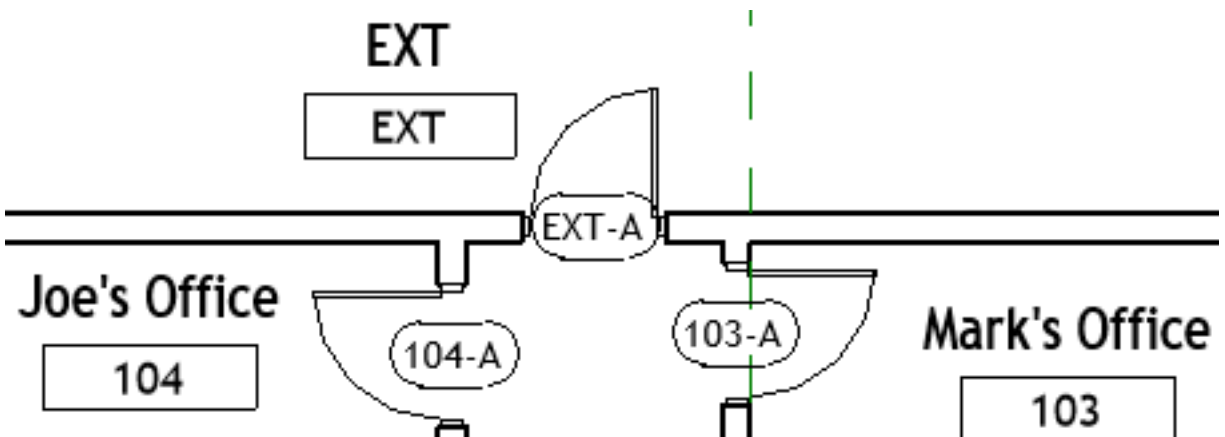


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STEP #9: RUN THE SCRIPT

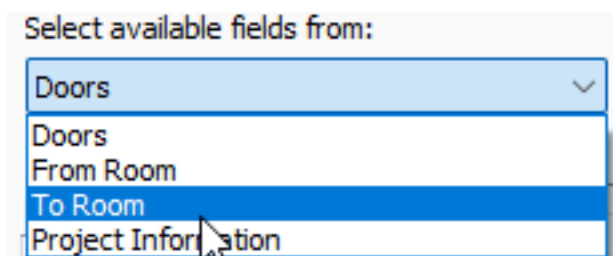
Try running the script! The doors should be renumbered with the unique number you've generated.



ADDENDUM #1: ADJUST FROM ROOM / TO ROOM VALUES

By default, the “To Room” value is always the direction where the door is swinging when the door is created. However, the attributes are not changed if the door is flipped after being created. That means you might need to adjust the values manually to get the room number you want for the door mark.

The best way to verify and change these values is to create a door schedule. When picking fields, use this dropdown menu.





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Pick the Mark parameter, the **From Room** number and the **To Room** number. Your schedule should look like this:

Mark	From Room:	To Room: N
104-A	107	104
103-A	107	103
102-A	107	102
105-A	107	105

When clicking on one of the From Room or To Room number, a dropdown menu appears. You can swap the numbers.

101-A	107	101
102-B	107	102
103-B	101	103

Adjust all values to fit what you need.

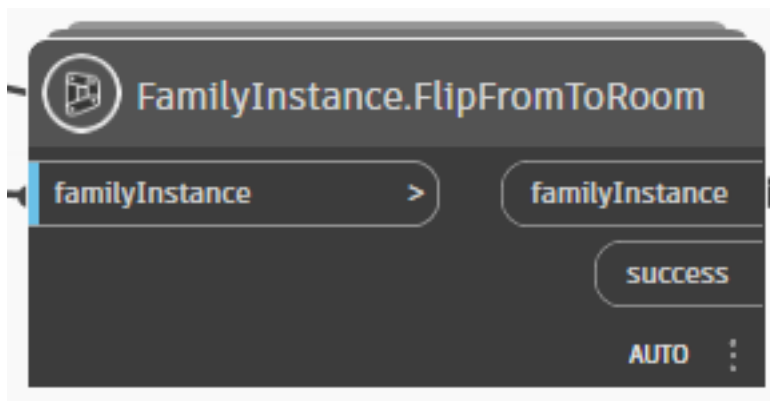


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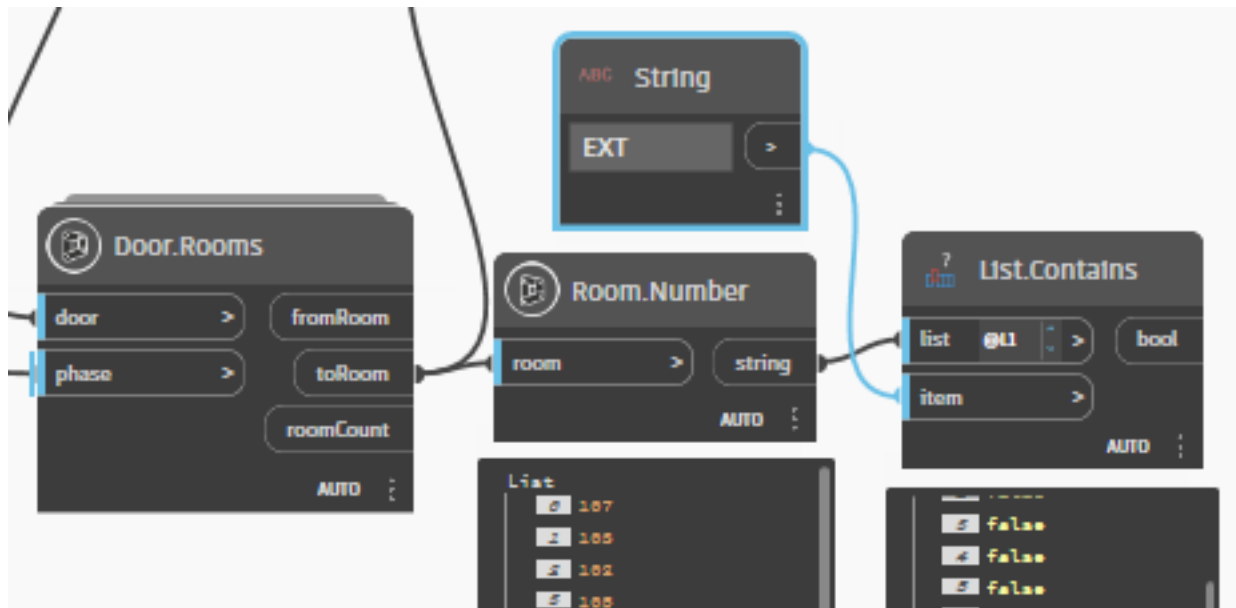
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ADDENDUM #2: AUTOMATE FROM ROOM / TO ROOM VALUES

Do you find it too boring to adjust these values manually? You could automate it with Dynamo. Clockwork has a node for that:



For example, you could ensure that the room EXT is never used to number doors. In this example, we use the String.Contains node to verify if this value is used for the room number.





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You can then use a `Filter.ByBoolMask` to only keep the doors who have EXT for the **To Room** number value. Then, plug the result of the `FilterByBoolMask` to the **FamilyInstance.FlipFromToRoom**. The values are switched only for these doors.



Meanwhile, get all doors once again. You will have to use the **Passthrough** node from Clockwork. This ensure that the second part of the script waits for the first part to be done before proceeding.



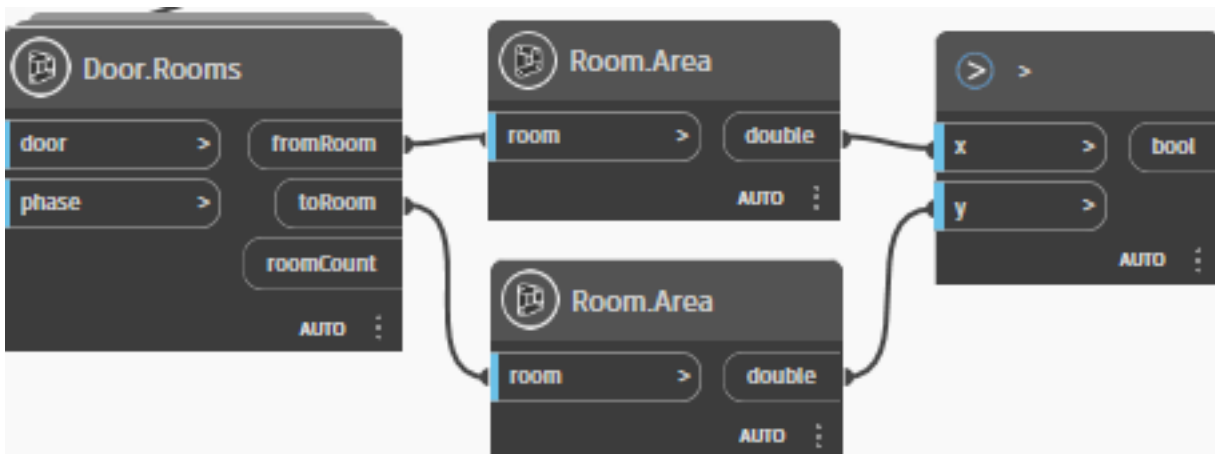


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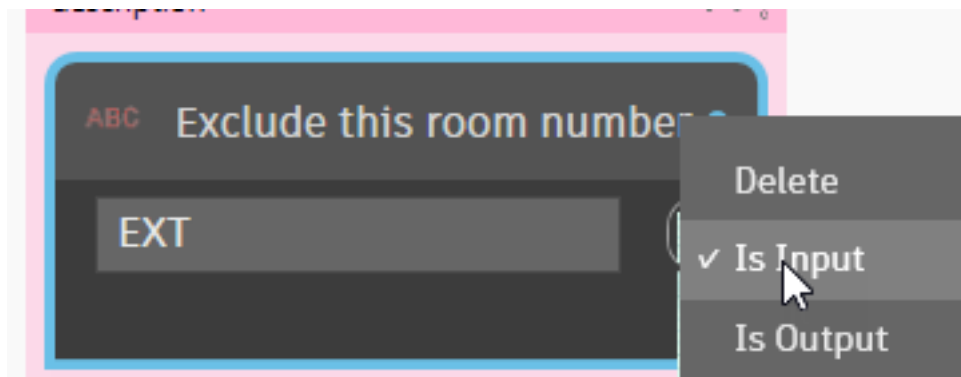
The rest of the script is the same as the first part of this pamphlet. There are alternative ways you could use to flip the From/To room.

For example, you could make a script where the **ToRoom** is always the smallest room. You would have to compare the area values:



ADDENDUM #3: PREPARING THE SCRIPT FOR THE DYNAMO PLAYER

Let's use the version of the script where we exclude room number = "EXT". For it to be used in the Dynamo player, you will need to determine all nodes that can be modified by the user. Right-click these nodes and select "Is Input". You can't do this on a **Code Block** node. You might need to replace some of them with **String** nodes instead.

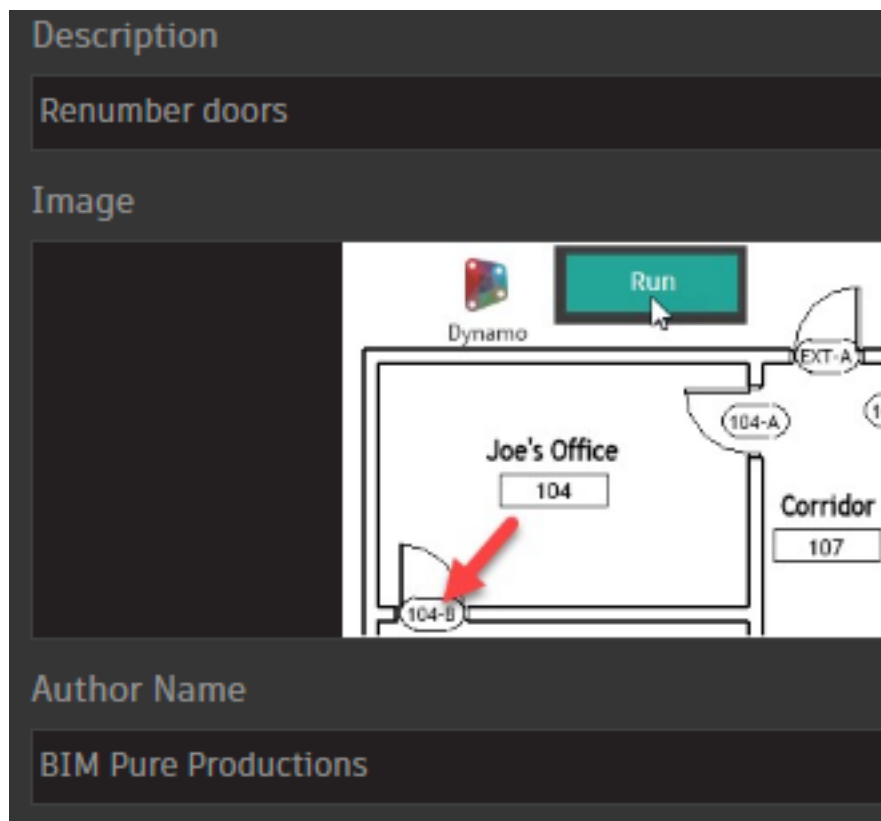
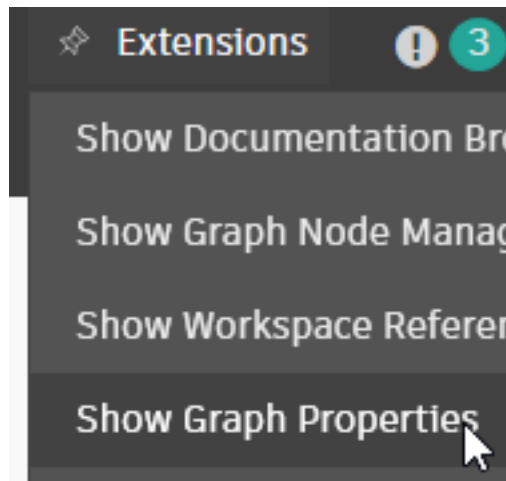




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In the menu, select **Graph Properties** to set a description, image and custom URL.





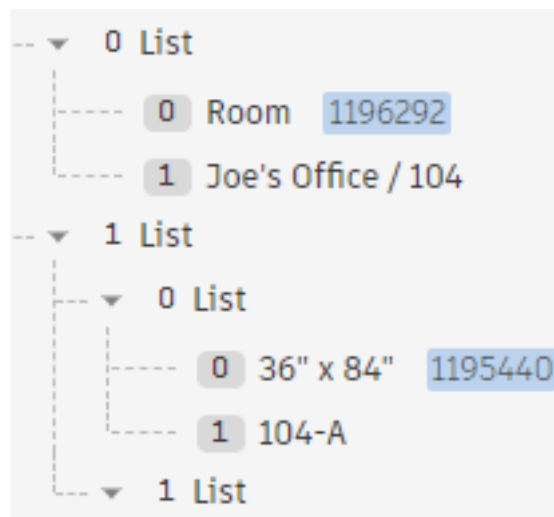
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Open the Dynamo Player and open the script. Fill out all the info:

Inputs	
Exclude this room number	<input type="text" value="EXT"/>
Numbering Letter or Number	<input type="text" value="A"/>
Select Phase	<input checked="" type="checkbox"/> <input type="text" value="New Construction"/>
Separator	<input type="text" value="-"/>

When running the script, you will also see a list of all “ToRoom”, along with the list of each doors renumbered per room.





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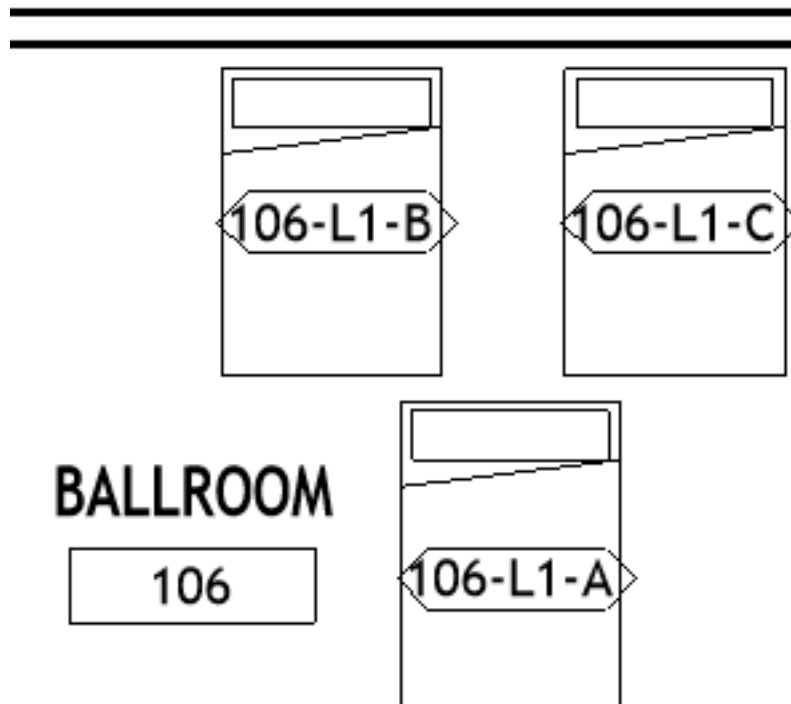
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SCRIPT #2 - RENUMBER FURNITURE BASED ON ROOMS & LEVELS

This script is quite similar to the previous, except we are using the Furniture category and we are adding a level acronym to the mark.

For example, a furniture placed in Room 202 on level 2 will be numbered 202-L2-A.

You can see the automatic numbering for the furniture after the script runs:





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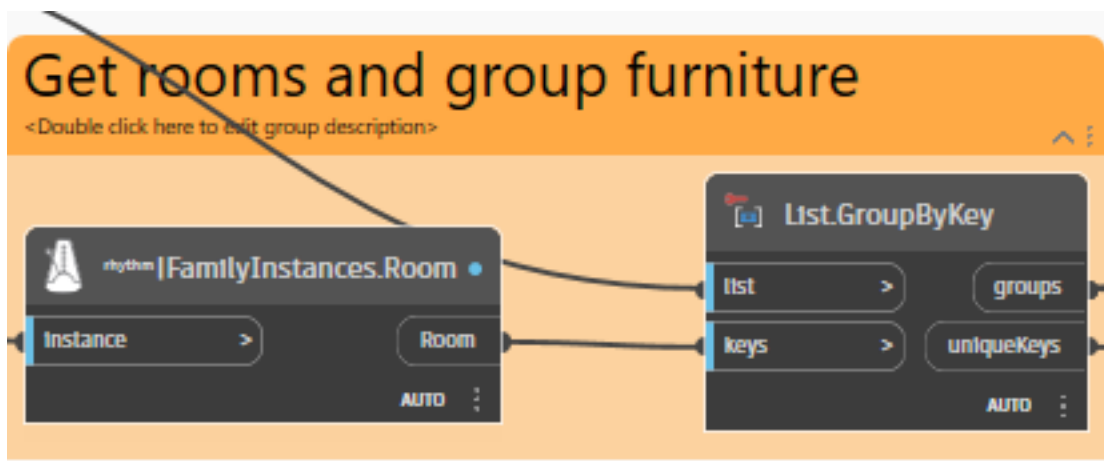
STEP #1: GET ALL FURNITURE

First, get all furniture.



STEP #2: GET THE ROOMS

Use the **FamilyInstances.Room** node to get all the rooms for all furniture. Use the **List.GroupByKey** node to group them together and get all the unique rooms with furniture.



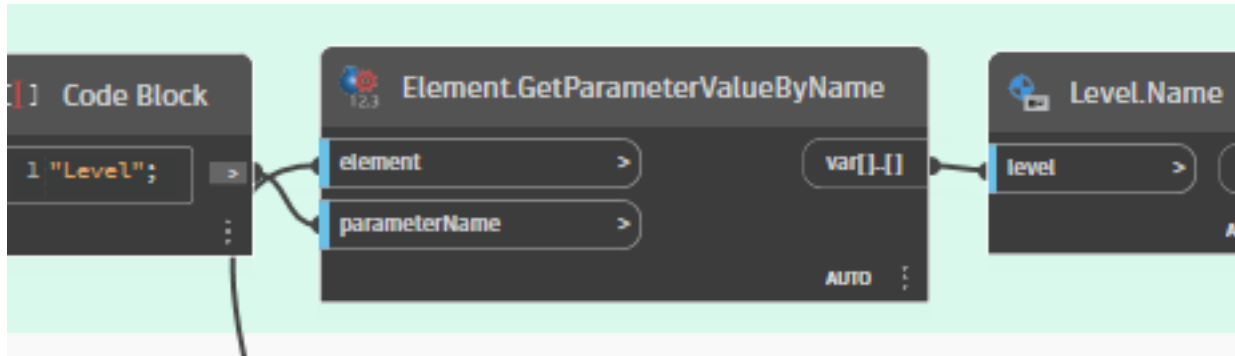


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STEP #3: GET THE LEVEL OF EACH FURNITURE

Take the grouped furniture elements and extract the Level from each.



STEP #4: GET ABBREVIATION FOR EACH LEVEL

The level name might be too long for the mark. You probably want an abbreviation. For example, “Level 1” might become L1. There are a few techniques to accomplish this.

First, you could create a project parameter with an abbreviation for each level:

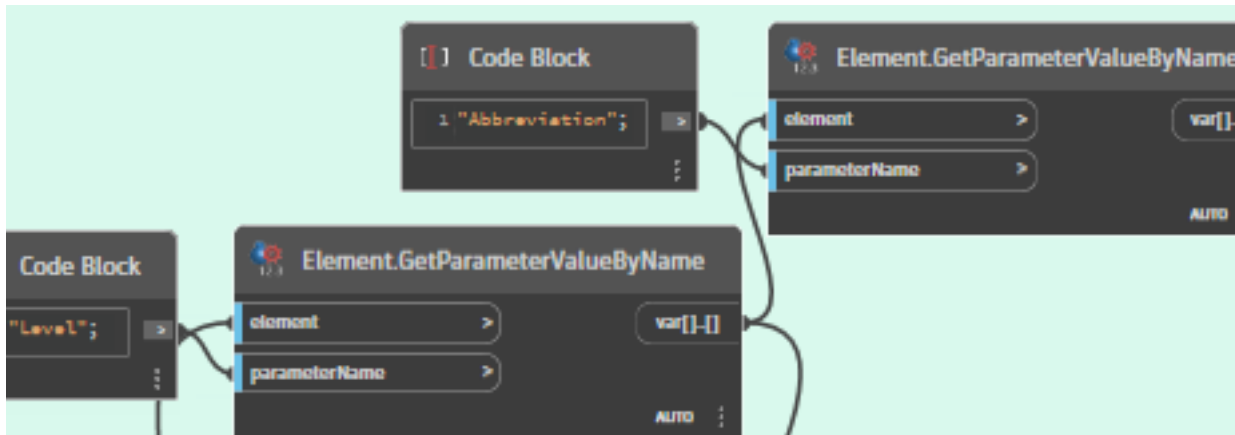




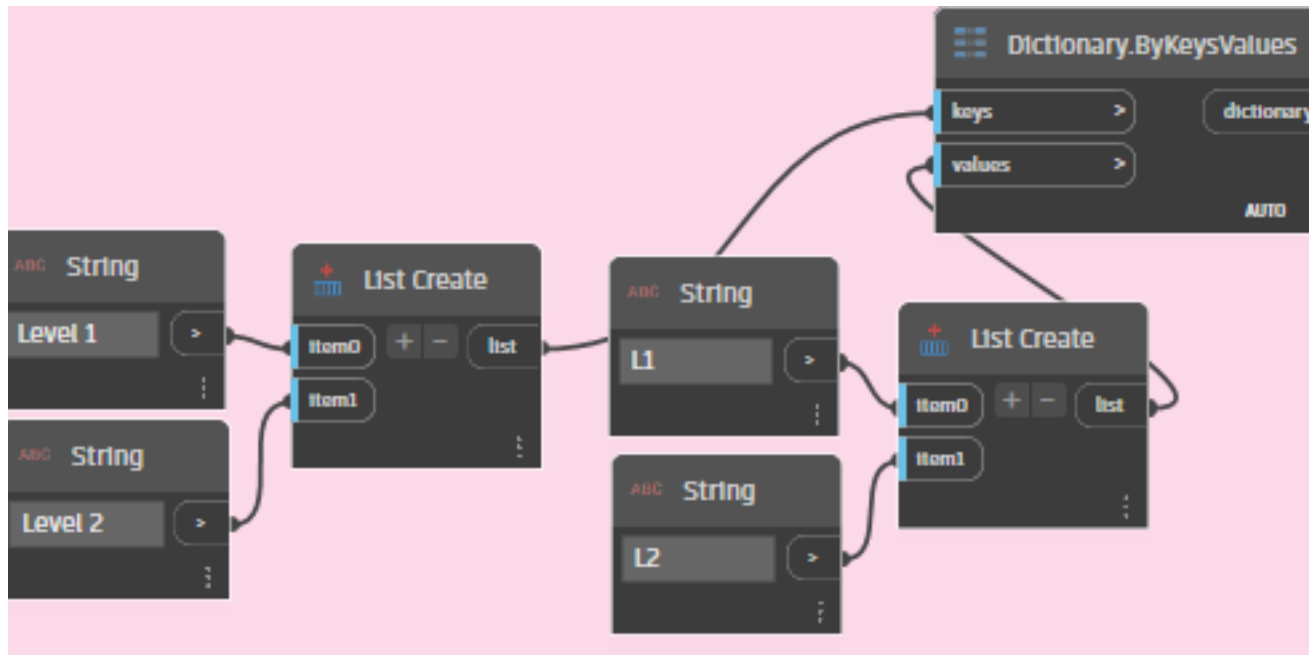
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If you pick this method, you only need to get the Abbreviation parameter from the level:



An alternative is to use the **Dictionary** nodes. This is used when you know the name of the levels and the abbreviation in advance. Create a list of the level names, and a list of the abbreviation. Plug them in the **Dictionary.ByKeyValues** node.

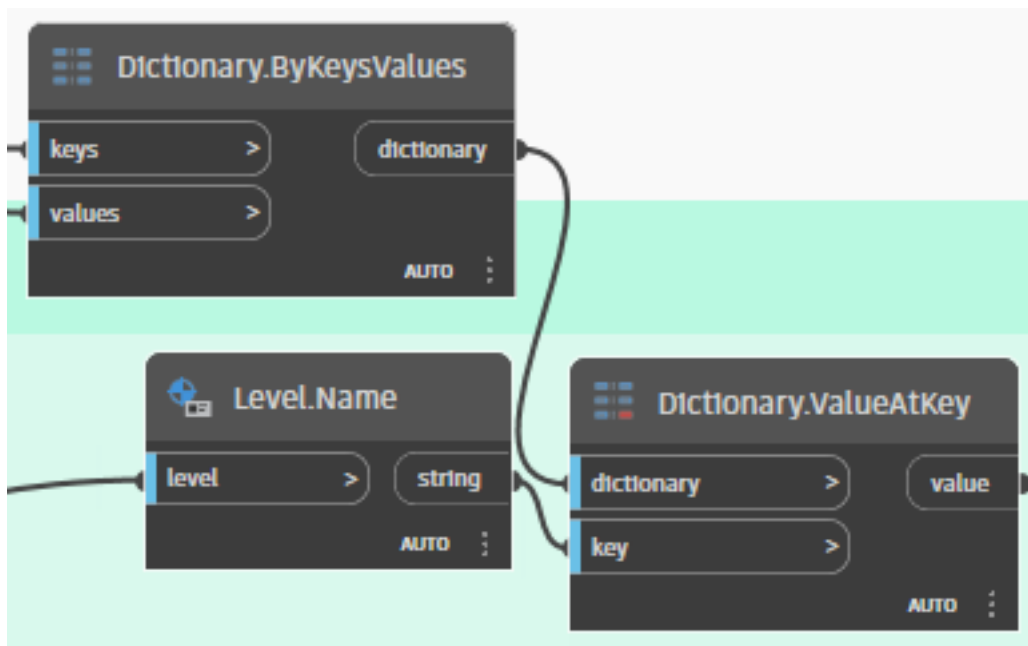




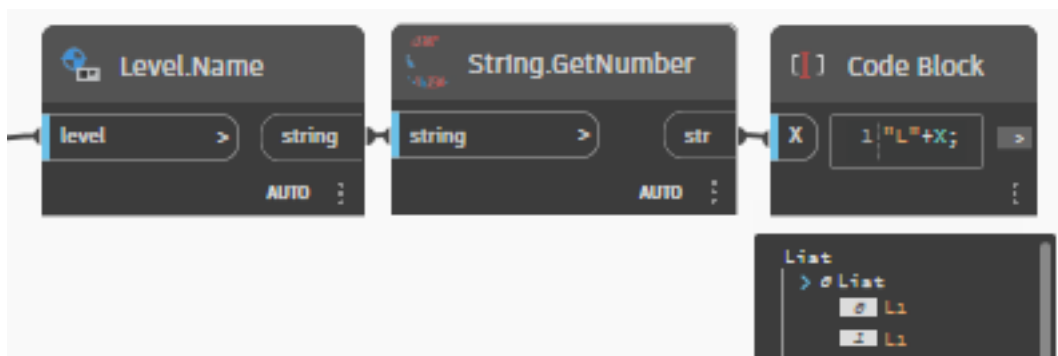
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Now, plug the dictionary output to another node called **Dictionary.ValueAtKey**. Use the level name as the key. This will convert the level name to the values used in the dictionary. For example, Level 1 will become L1.



A final alternative is to use the **String.GetNumber** node. This returns all the numbers in a string. This works great, except if there are multiple numbers in the level name. Combine the number with a letter using a Code Block node.





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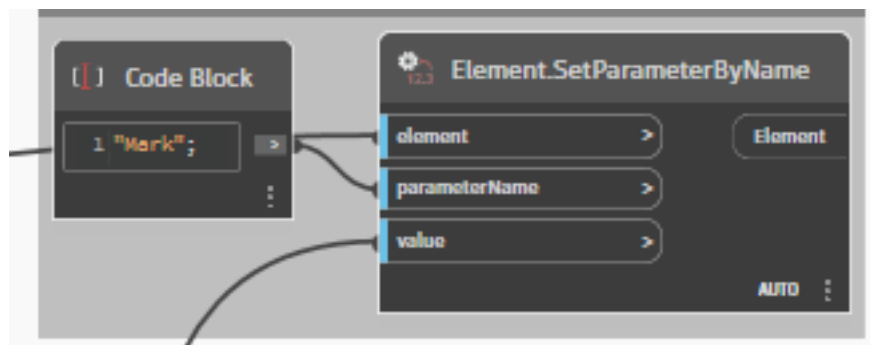
STEP #5: GENERATE UNIQUE NUMBERS

Then, you can combine the room number, the level abbreviation and the unique letter by using the Code Block.



STEP #6: SET MARK PARAMETER

Finally, use the **Element.SetParameterByName** node. That's it.





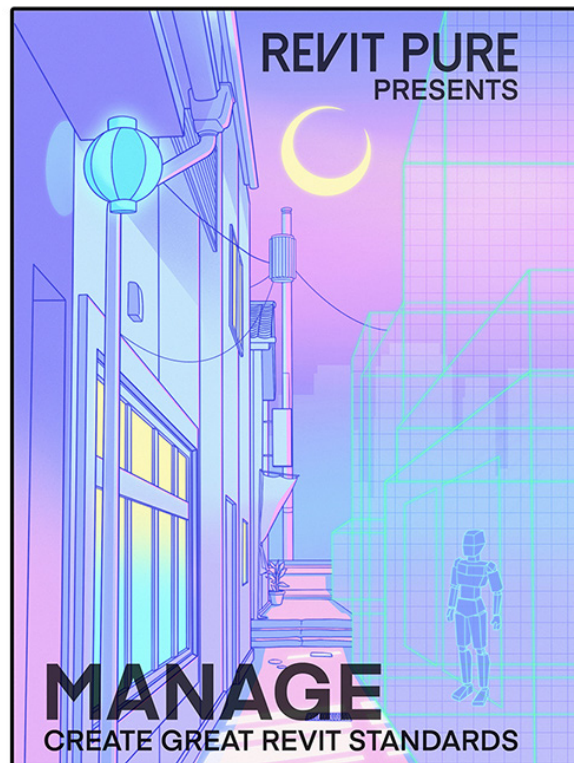
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GET THE SCRIPTS, UNLEASH YOUR BIM MANAGER SKILLS

We have created a course called MANAGE for users who want to become a BIM superstar in their organization. You will learn everything you need to know to manage your BIM models, including more Dynamo fun.

The course includes **all scripts described in this pamphlet**. Get the MANAGE package now:





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THANKS FOR READING!

As always, send your thoughts to nick@revitpure.com. I read and answer all emails. Let me know what theme you want explored for the next edition.