

Revit 插件: Dynamo 应用范例详解

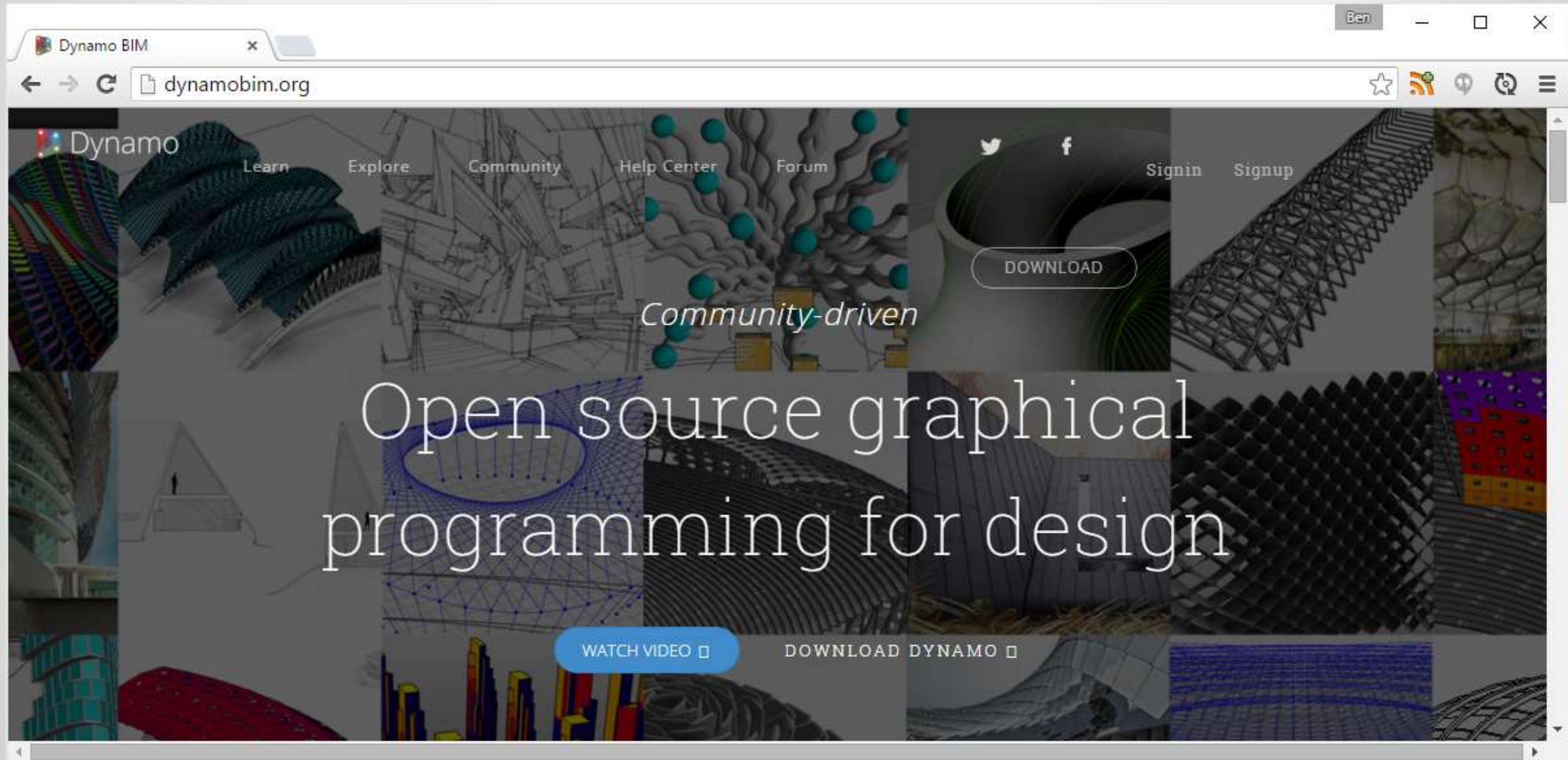
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首席工程师

Dynamo 工作室流程

- **Dynamo 简介**
 - Dynamo 基本操作
 - 几何概念，参数和向量
- **结构框架**
 - 处理列表
 - 自定义节点
 - 参考和放置 Revit 元素
- **自适应构件**
 - 放置自适应构件
 - 列表映射
- **处理表格式数据**
 - 从 **Excel** 读取数据
 - 高级数据管理技巧和工具
 - **Code Block** 与范围表达式
- **实例：讲堂座位放置**

Dynamo 官方网站

- www.dynamobim.org



学习资料 Dynamo Primer

- www.dynamoprimer.com

range

- 8.2. Selecting
- 8.3. Editing
- 8.4. Creating
- 8.5. Customizing
- 8.6. Documenting**

9. Custom Nodes

- 9.1. Custom Node Introduction
- 9.2. Creating a Custom Node
- 9.4. Python Nodes
- 9.5. Python and Revit

10. Packages

1. Code Block

2. Color By ARGB

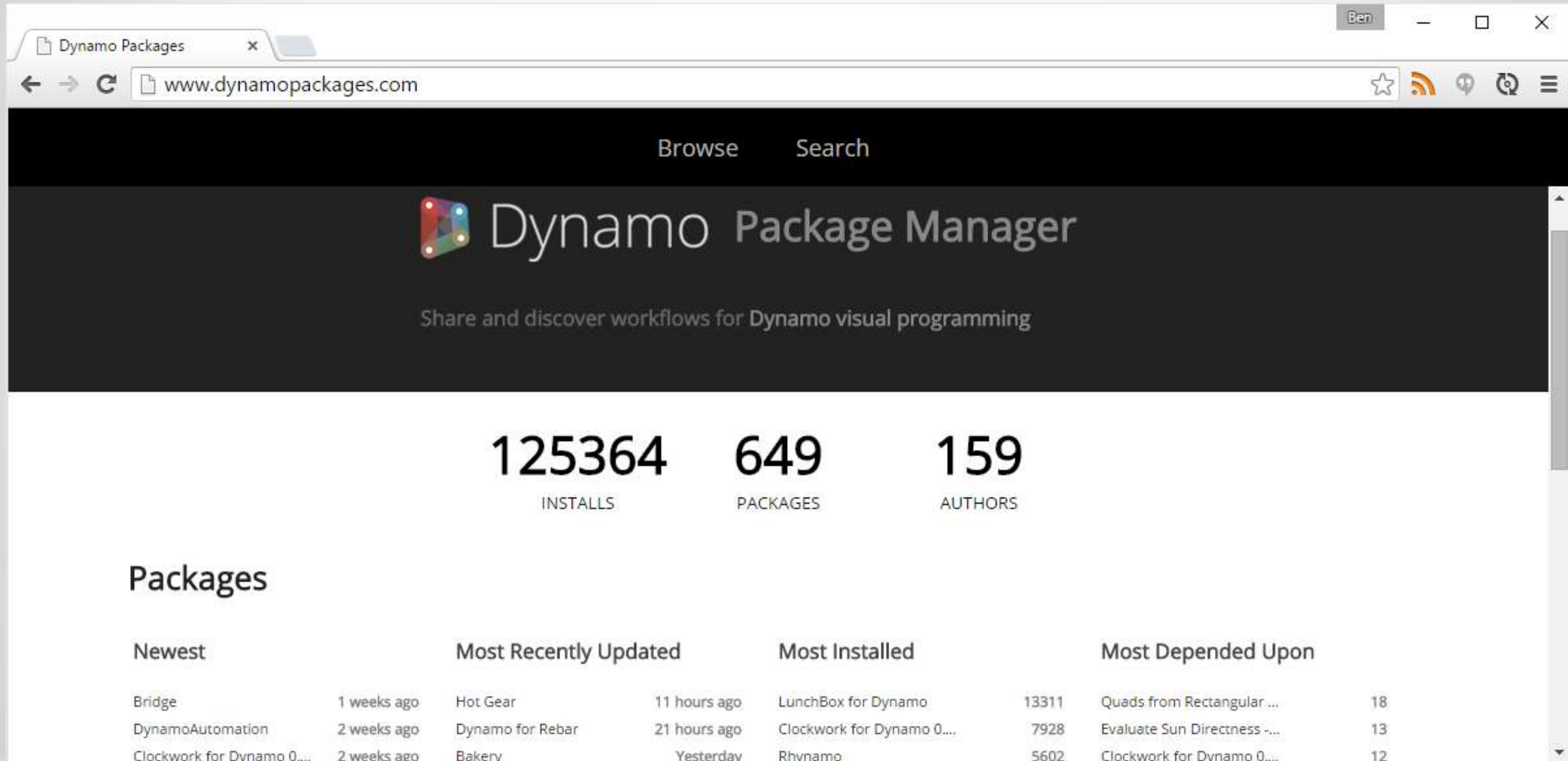
3. List Create

4. Color Range

Element.OverrideColorInView

Dynamo 软件包

- www.dynamopackages.com



The screenshot shows the website www.dynamopackages.com in a browser window. The page features a dark header with navigation links for "Browse" and "Search". Below the header is the site's logo and the text "Dynamo Package Manager" and "Share and discover workflows for Dynamo visual programming".

Key statistics displayed on the page are:

- 125364 INSTALLS
- 649 PACKAGES
- 159 AUTHORS

The "Packages" section is organized into four columns based on sorting criteria:

Package Name	Update Time	Package Name	Update Time	Package Name	Install Count	Package Name	Install Count
Bridge	1 weeks ago	Hot Gear	11 hours ago	LunchBox for Dynamo	13311	Quads from Rectangular ...	18
DynamoAutomation	2 weeks ago	Dynamo for Rebar	21 hours ago	Clockwork for Dynamo 0...	7928	Evaluate Sun Directness ...	13
Clockwork for Dynamo 0...	2 weeks ago	Bakery	Yesterday	Rhynamo	5602	Clockwork for Dynamo 0...	12

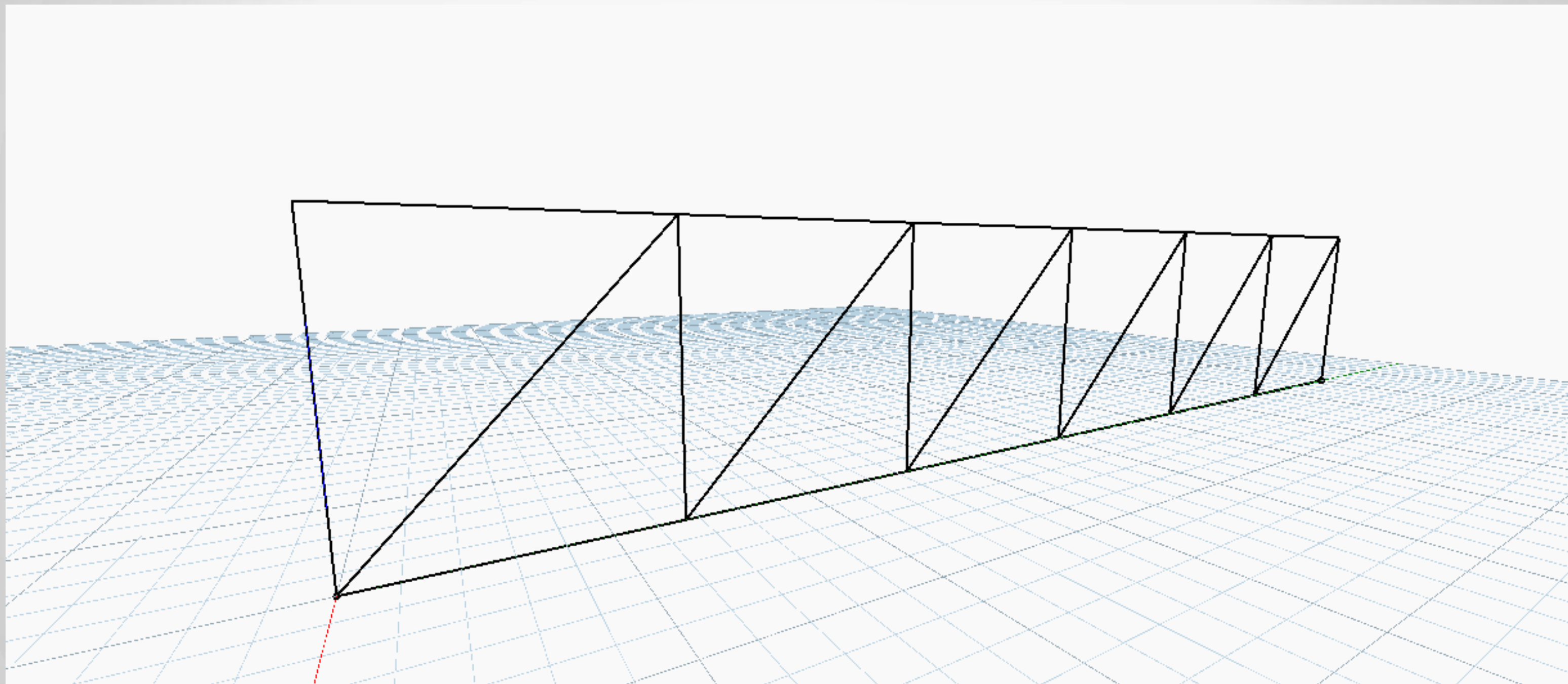
Dynamo 开源项目

- [www.github.com/DynamoDS/Dynamo](https://github.com/DynamoDS/Dynamo)

The screenshot shows the GitHub repository page for `DynamoDS / Dynamo`. The repository is described as "Visual Programming" with a link to `http://dynamobim.org`. It has 24,381 commits, 99 branches, 0 releases, and 47 contributors. The current branch is `master`. The repository is active, with a "Dynamo / +" button. The commit history shows several recent updates, including a merge pull request #5650 from `aosyatnik/SearchUIUpdates` 15 hours ago, and updates to `doc`, `extern`, `src`, `test`, and `tools` folders. The `.gitattributes` file was updated 3 years ago. The right sidebar shows options to view the code, issues (771), pull requests (19), wiki, pulse, and graphs. The HTTPS clone URL is `https://github.com`.

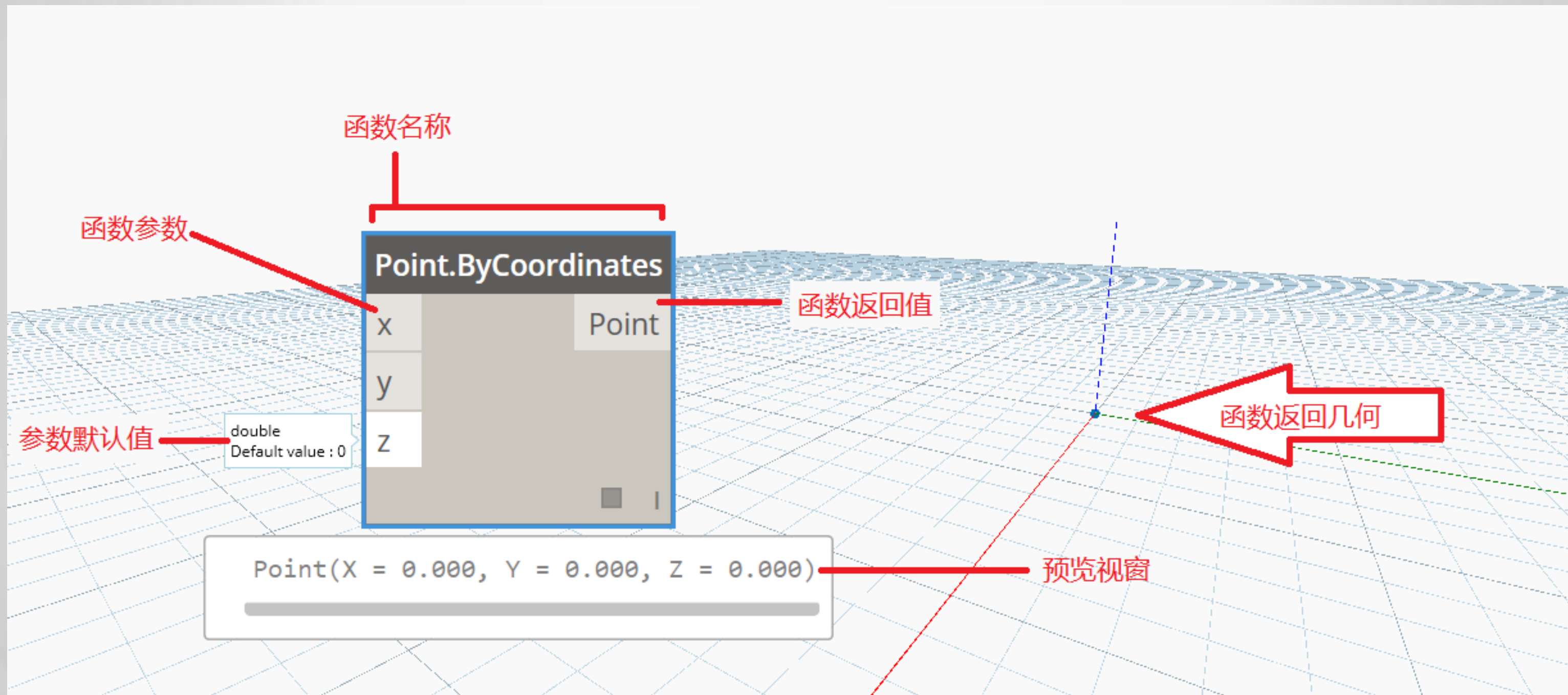
案例一：创建桁架结构

- Dynamo 基本操作，桁架结构的建造过程



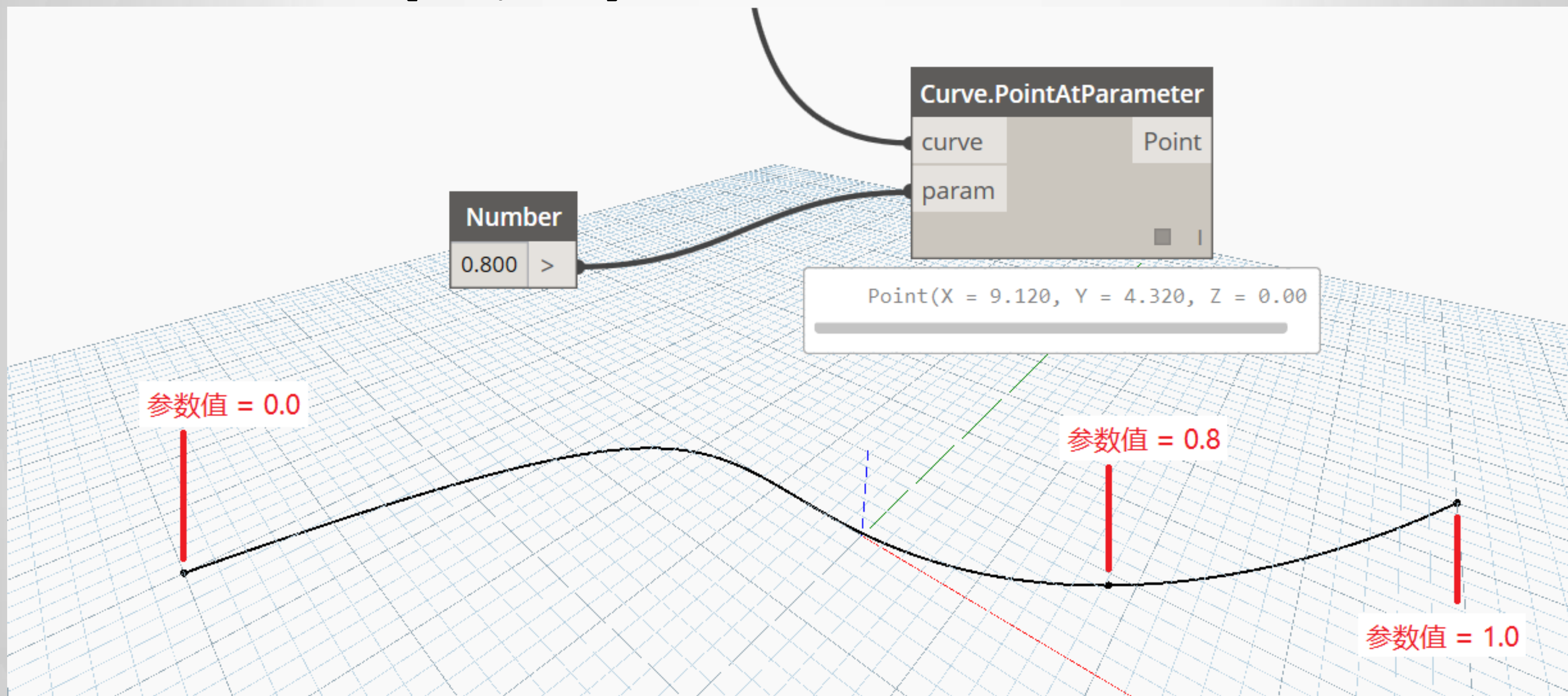
节点与函数对比

- 节点参数，默认值，返回值，几何图形



曲线参数值

- 参数值范围 [0.0, 1.0]

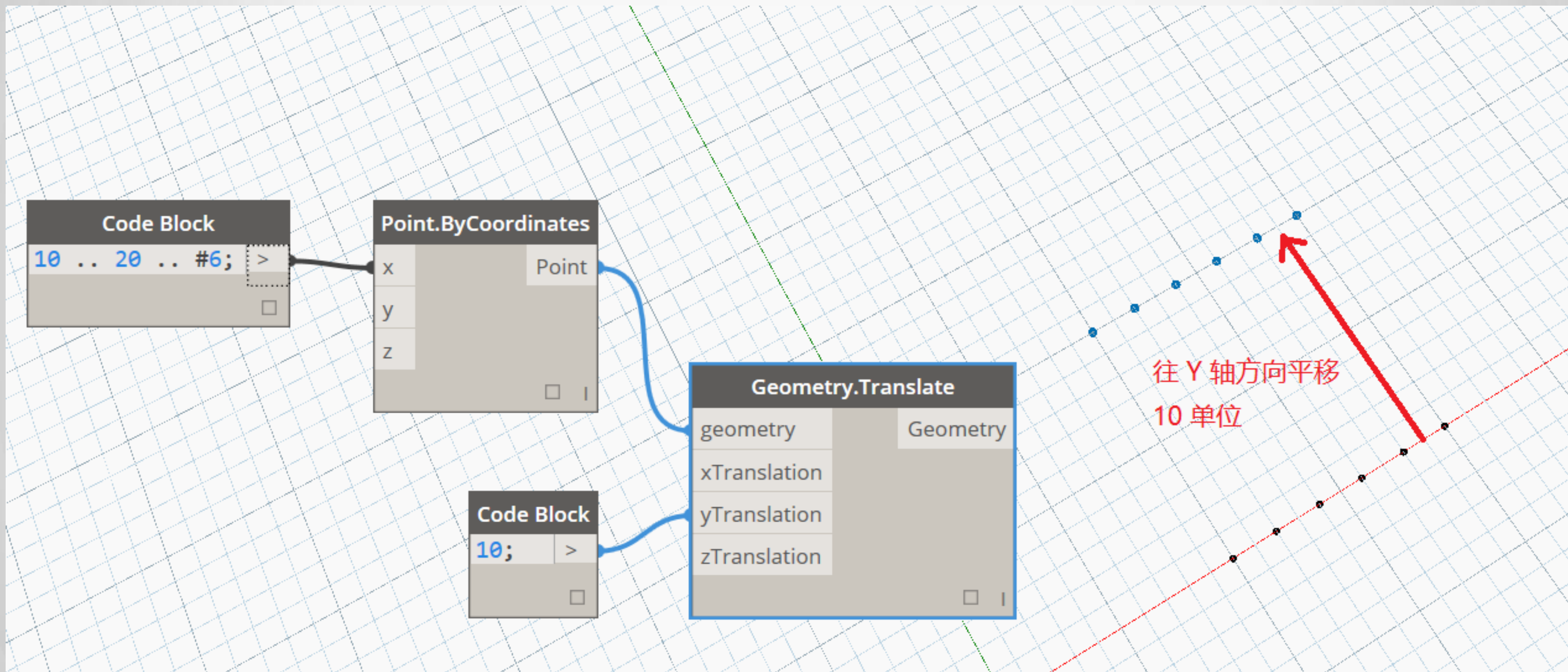


范围表达式

- 表达式一：起始值 .. 最终值
 - $10 .. 15 = \{ 10, 11, 12, 13, 14, 15 \}$
- 表达式二：起始值 .. 最终值 .. 距离
 - $10 .. 20 .. 2 = \{ 10, 12, 14, 16, 18, 20 \}$
 - $10 .. 20 .. 3 = \{ 10, 13, 16, 19 \}$
- 表达式三：起始值 .. 最终值 .. #数目
 - $10 .. 20 .. \#3 = \{ 10.0, 13.33, 16.66, 20.0 \}$
 - $10 .. 20 .. \#5 = \{ 10.0, 12.5, 15.0, 17.5, 20.0 \}$
- 表达式四：起始值 .. #数目 .. 距离
 - $10 .. \#5 .. 3 = \{ 10, 13, 16, 19, 22 \}$

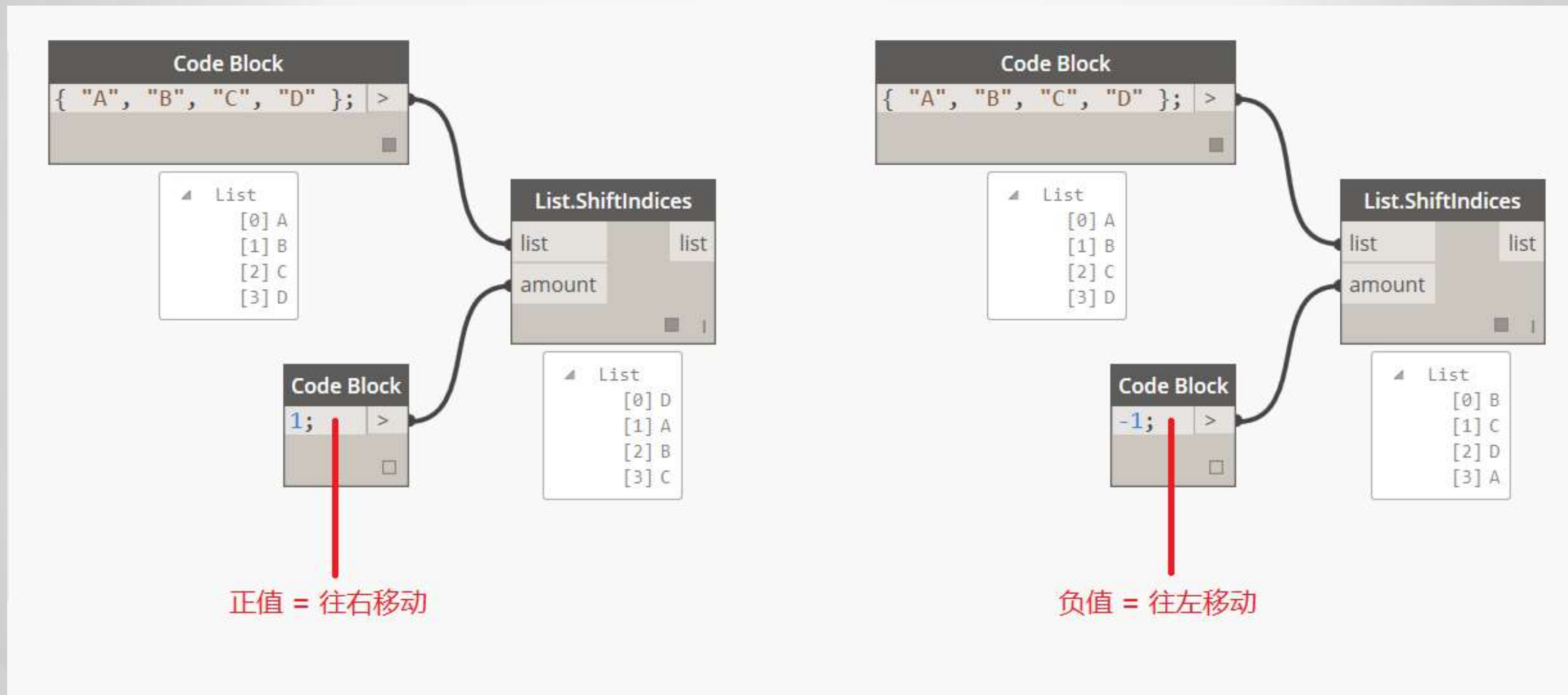
平移几何图形

- 以向量移动并复制几何图形: **Geometry.Translate**

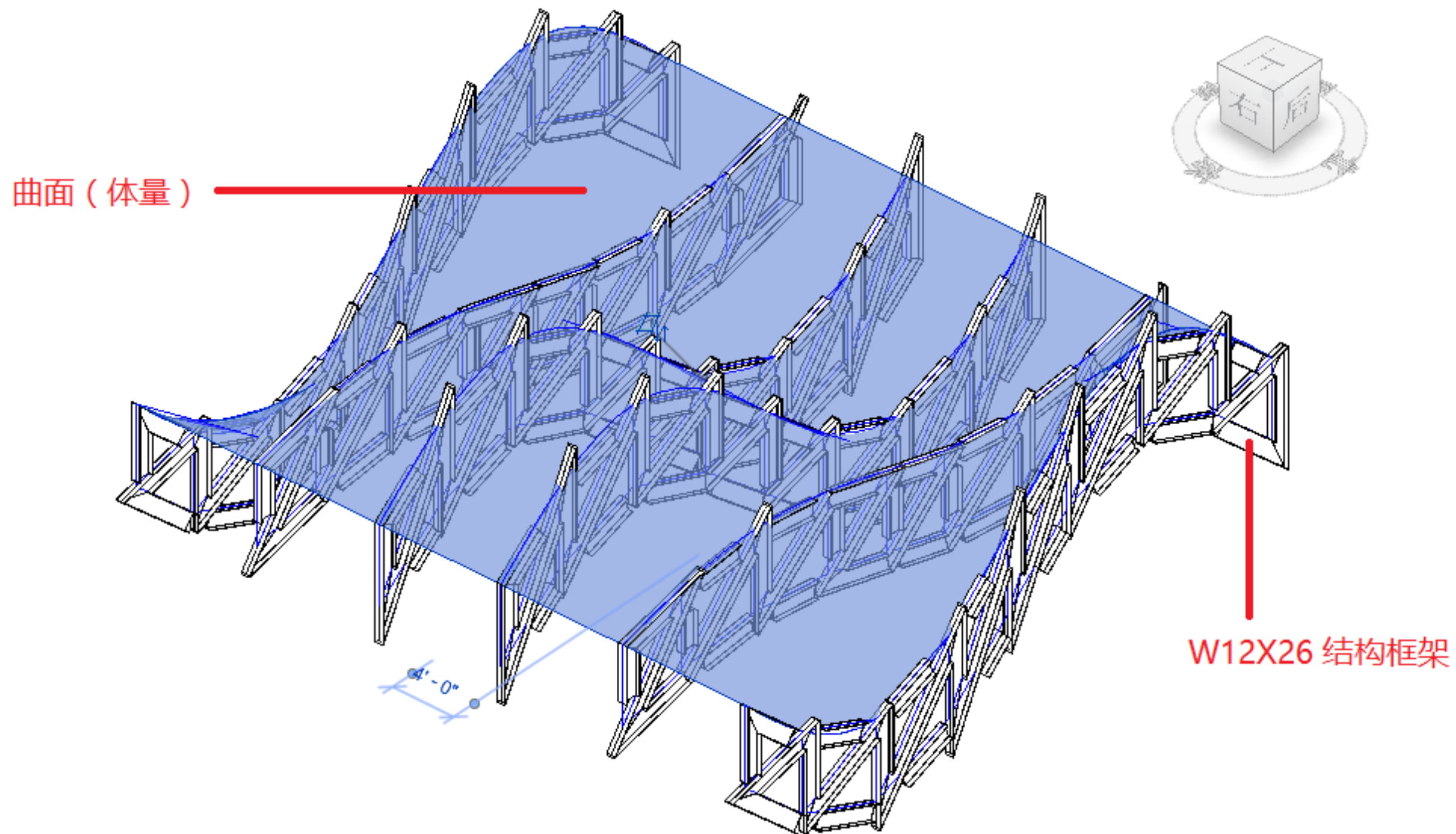


列表元素移动

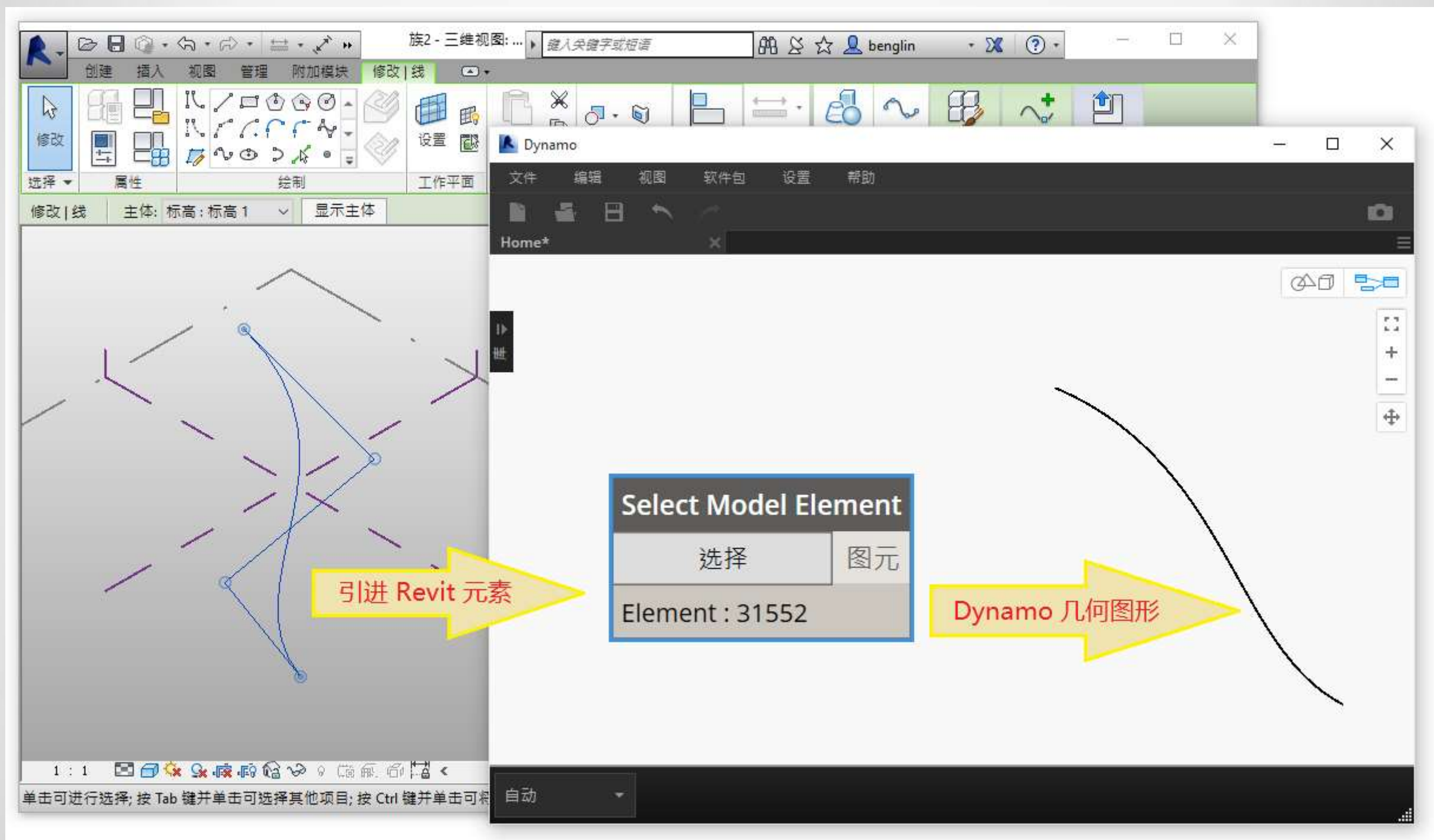
- 将列表索引值往左/右移动: List.ShiftIndices



案例二：放置桁架结构

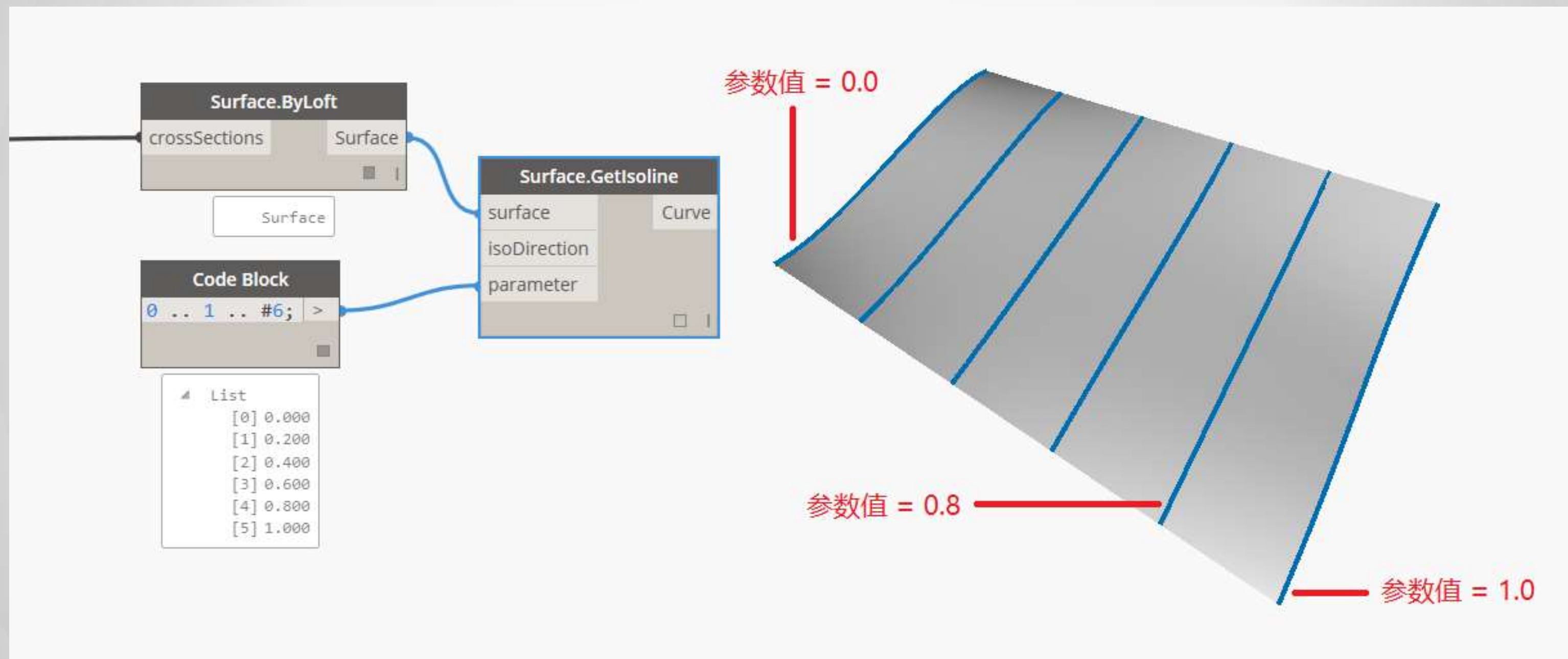


Revit Selection Node (Revit 选择节点)

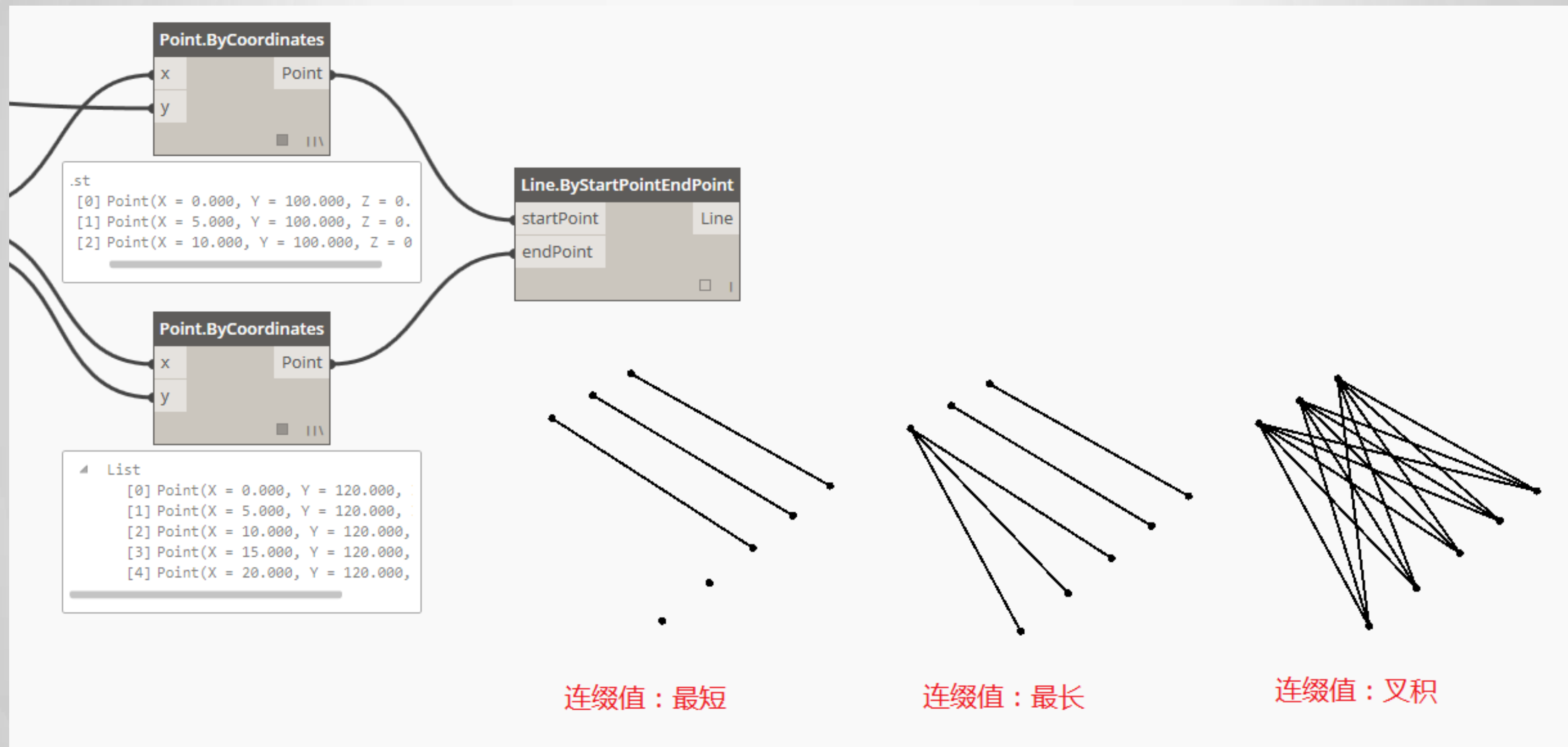


创建参数线 (Isoline)

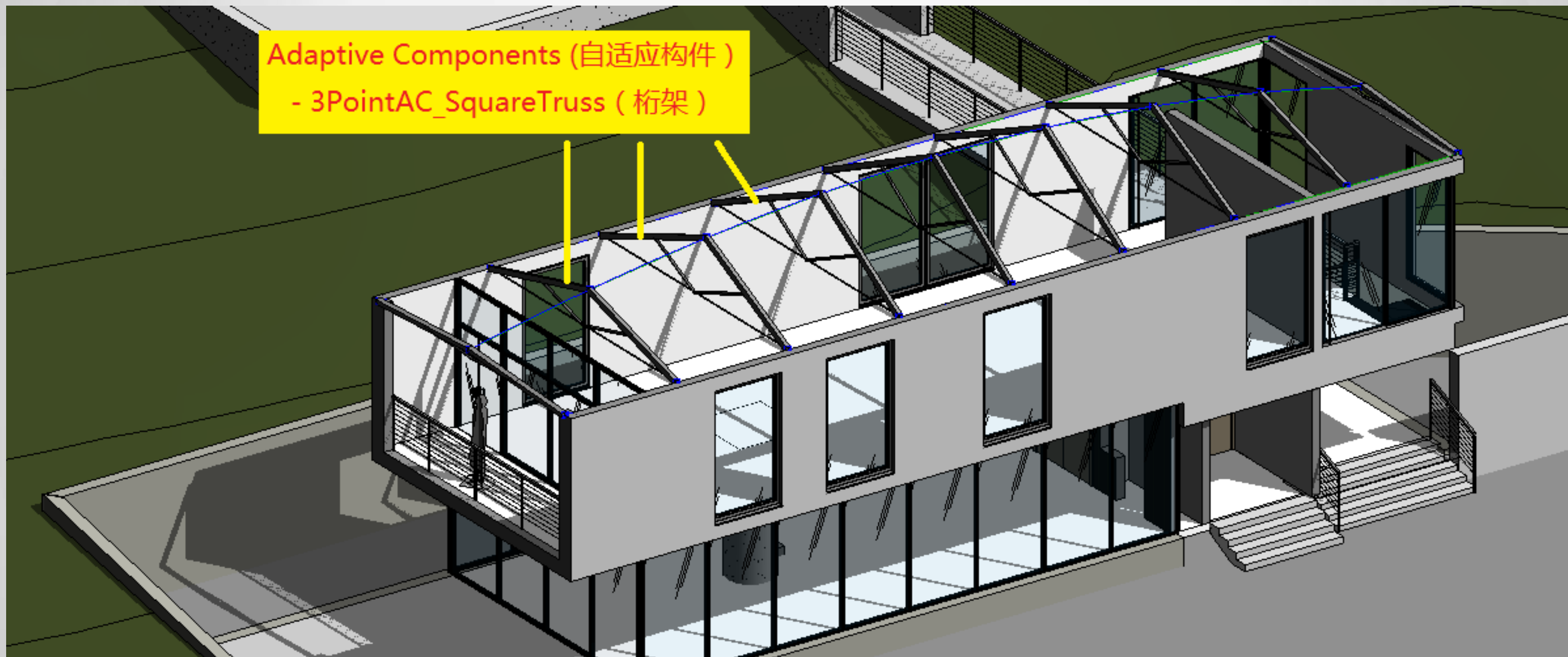
- 在给定曲面上创建参数线: Surface.GetIsoline



连缀设定与列表处理



案例三：放置自适应构件 (Adaptive Component)



转换二维列表的行和列

```
Code Block
array2D =
{
  { "A", "B", "C" },
  { "D", "E" },
  { "F", "G", "H", "I" }
};
```

二维阵列 (3 X 4)

- List
 - [0] List
 - [0] A
 - [1] B
 - [2] C
 - [1] List
 - [0] D
 - [1] E
 - [2] List
 - [0] F
 - [1] G
 - [2] H
 - [3] I

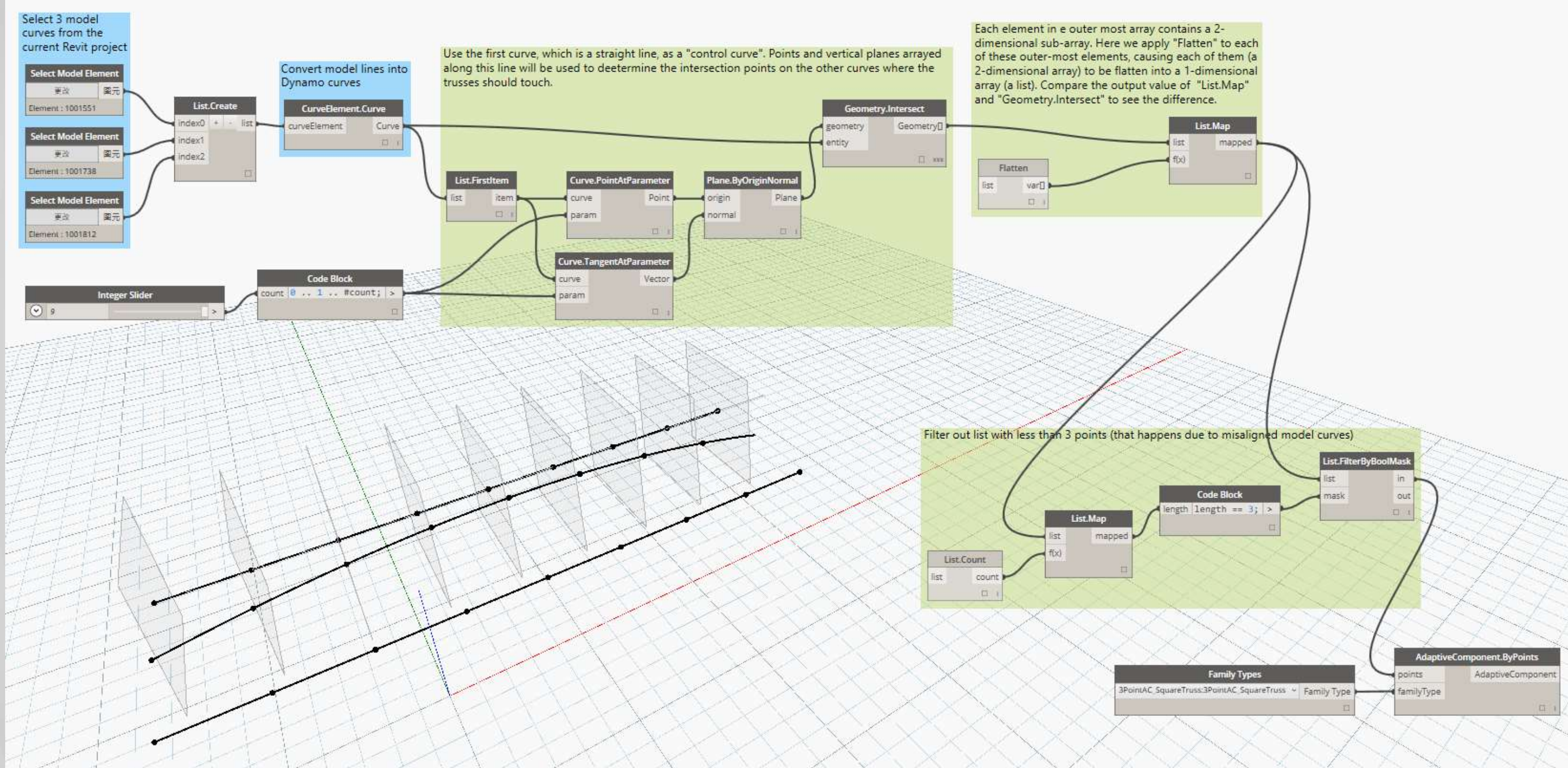
```
List.Transpose
lists
```

- List
 - [0] List
 - [0] A
 - [1] D
 - [2] F
 - [1] List
 - [0] B
 - [1] E
 - [2] G
 - [2] List
 - [0] C
 - [1] null
 - [2] H
 - [3] List
 - [0] null
 - [1] null
 - [2] I

二维阵列 (4 X 3)

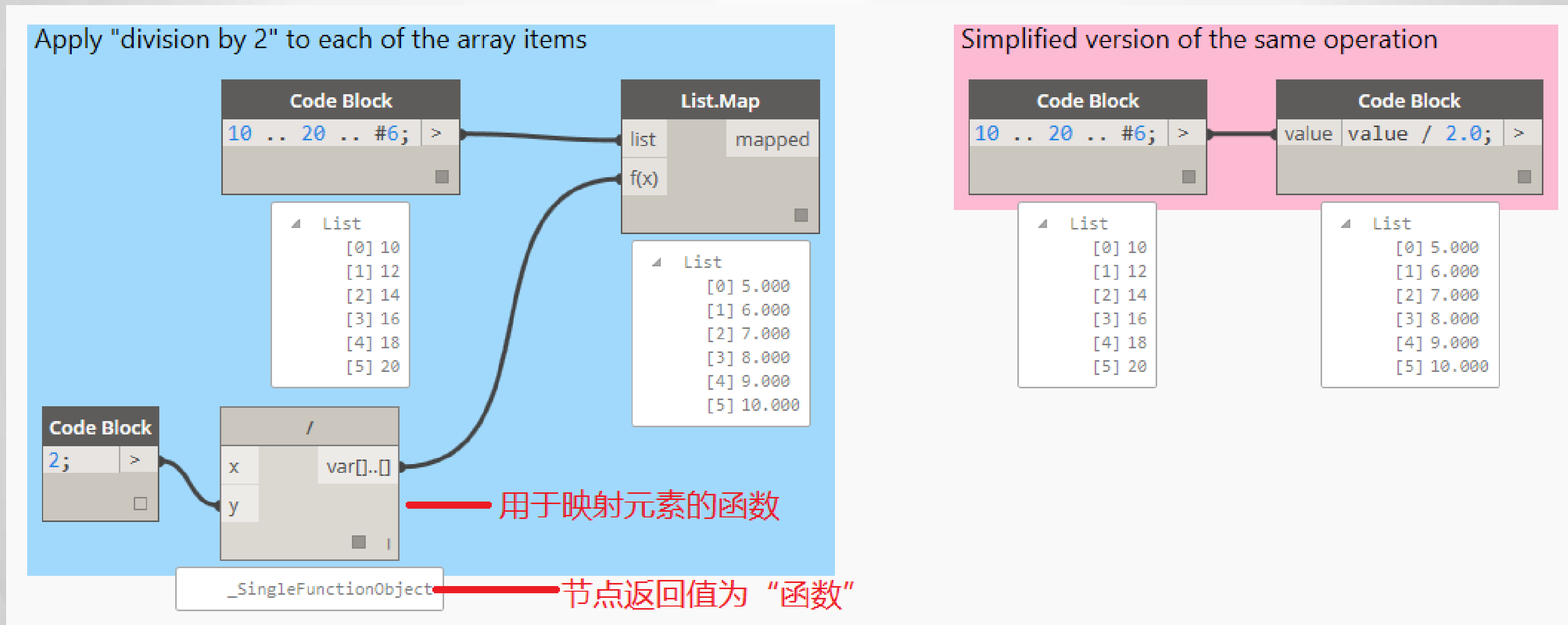
以 null (空值) 填补空缺

案例四：以平面放置自适应构件



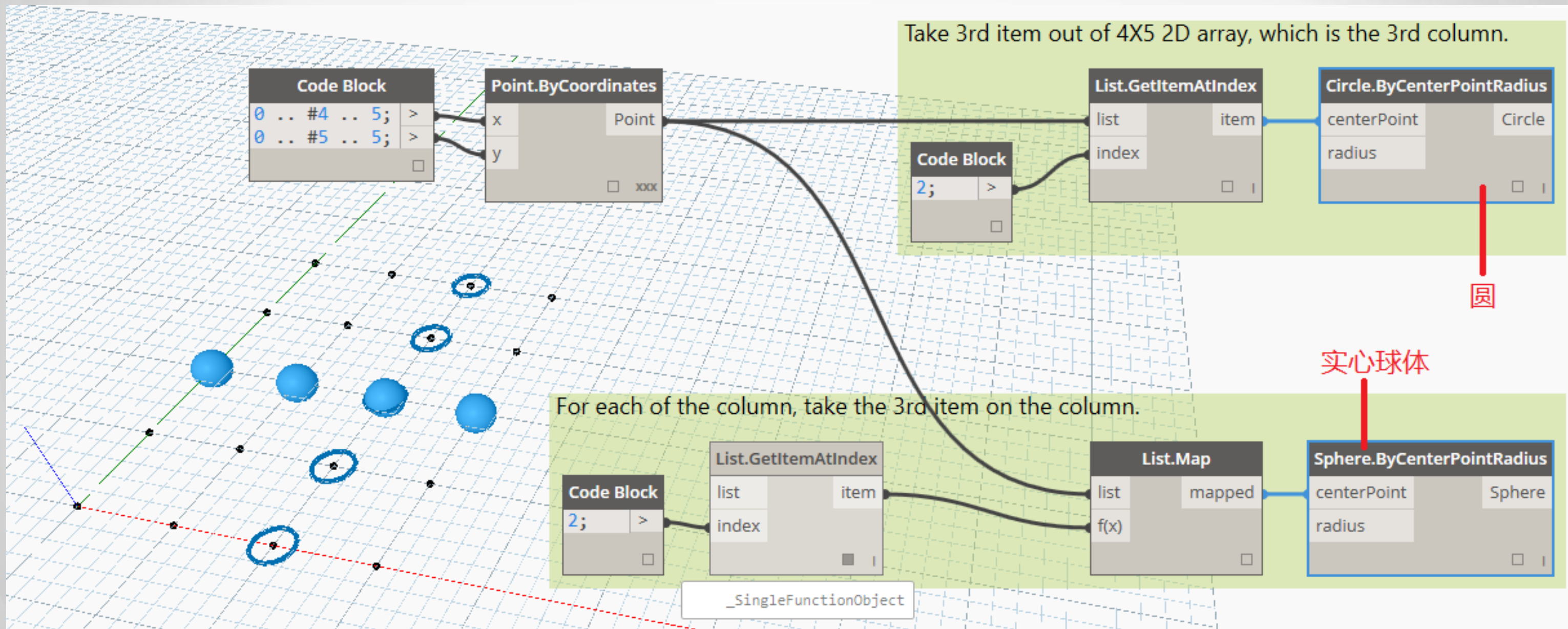
List.Map 把函数应用到列表每个元素上

- 例子：将每个列表元素除以二

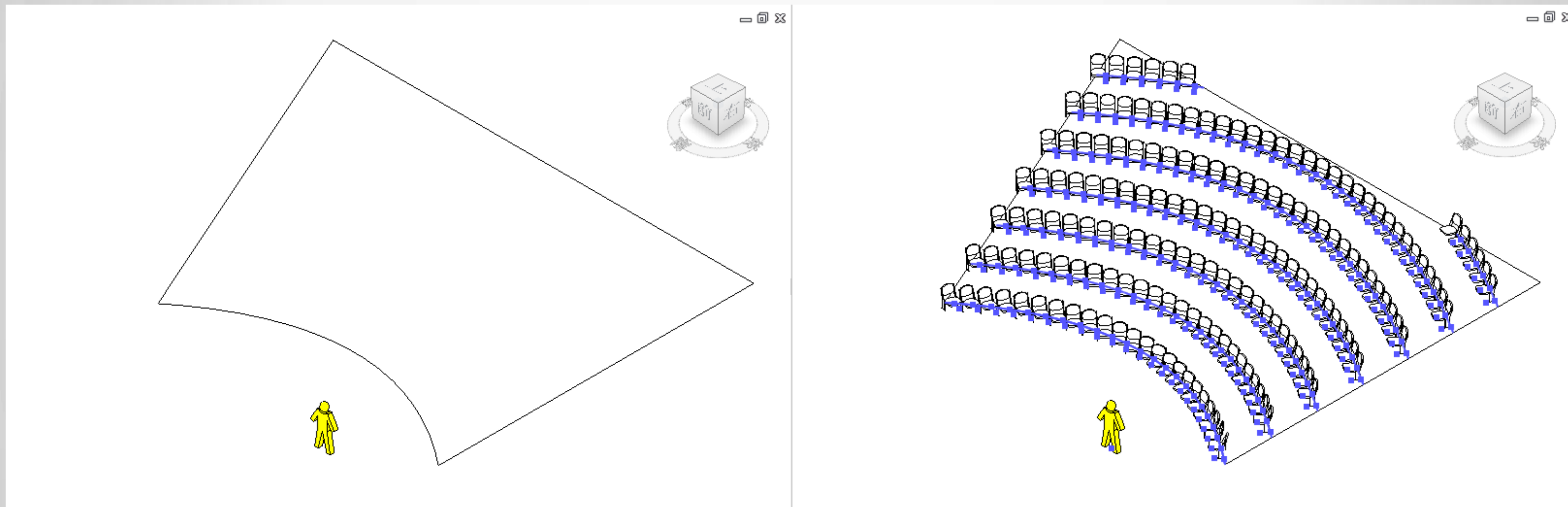


List.Map 较适用于二维或以上列表

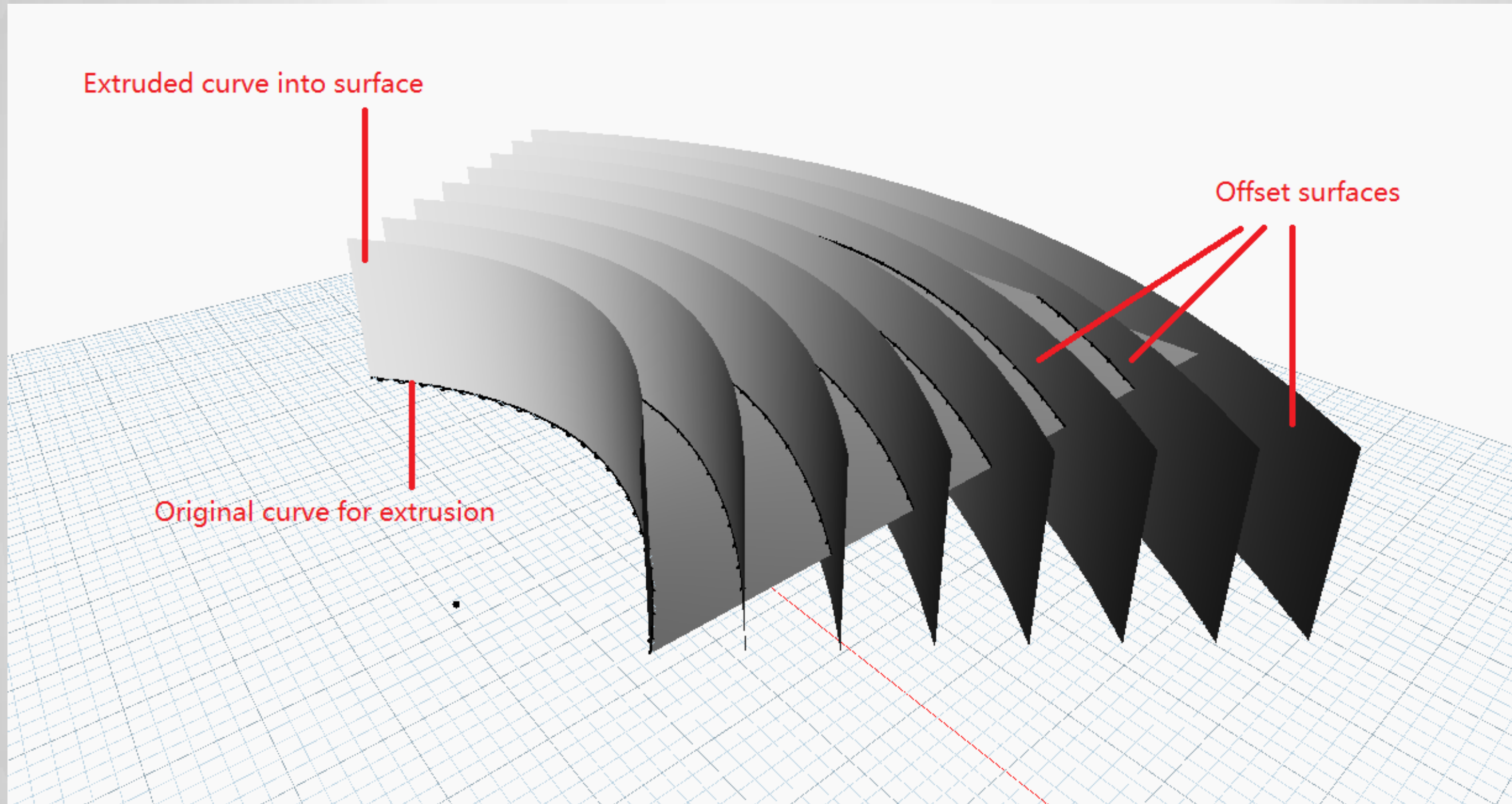
- 例子：把函数映射到二维列表元素上



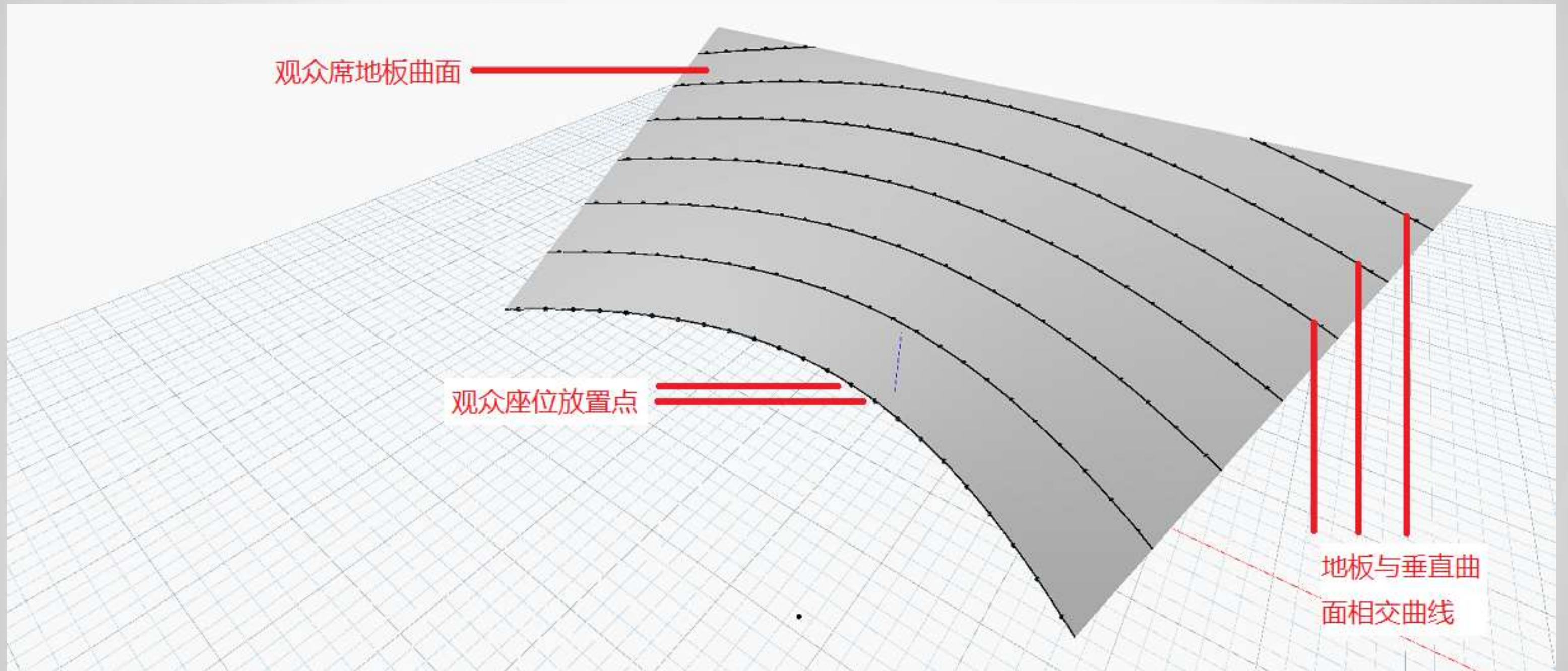
案例五：礼堂座位排列



Curve extrusion and surface offset

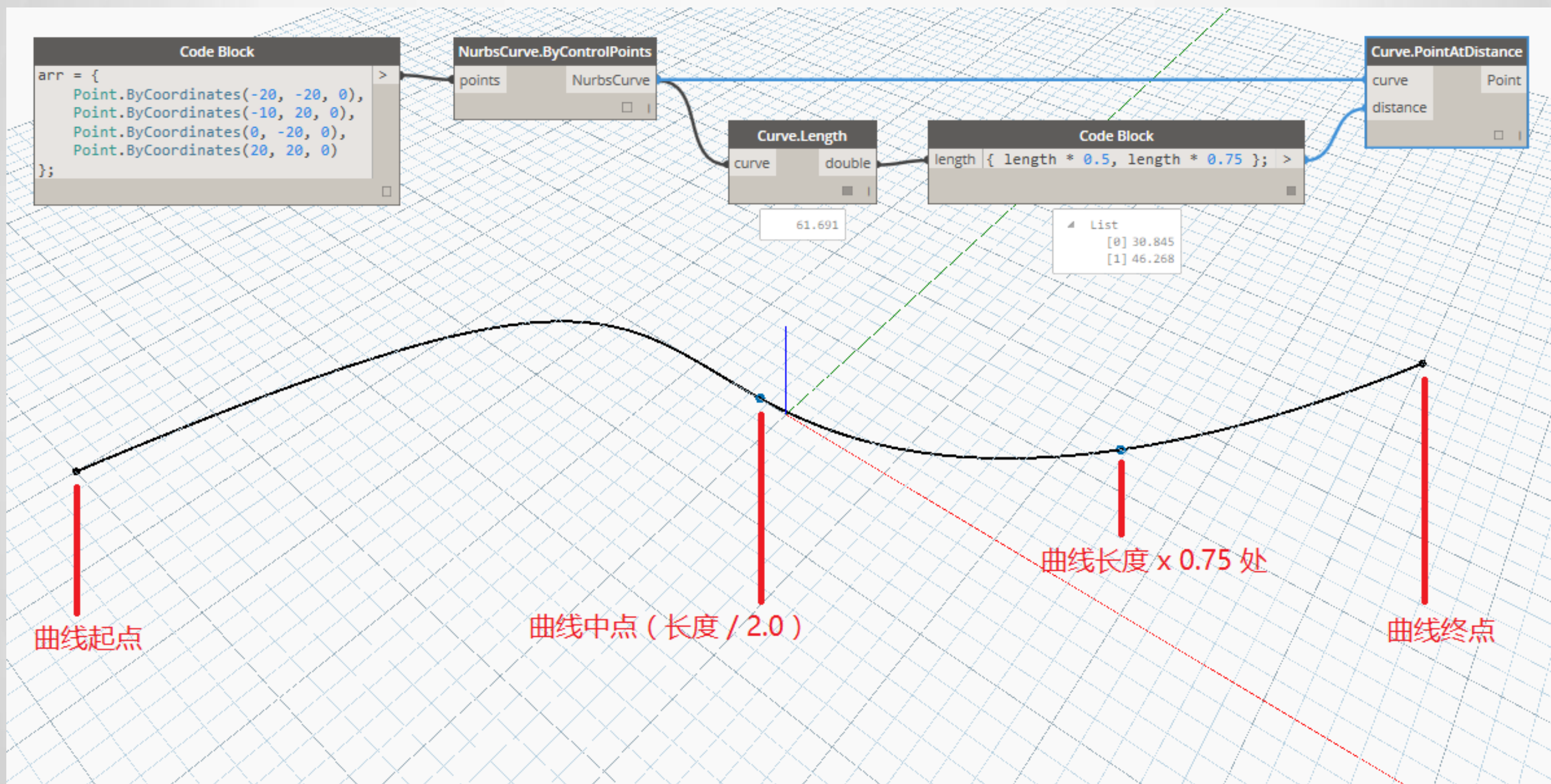


Curve on surface with points placed on them



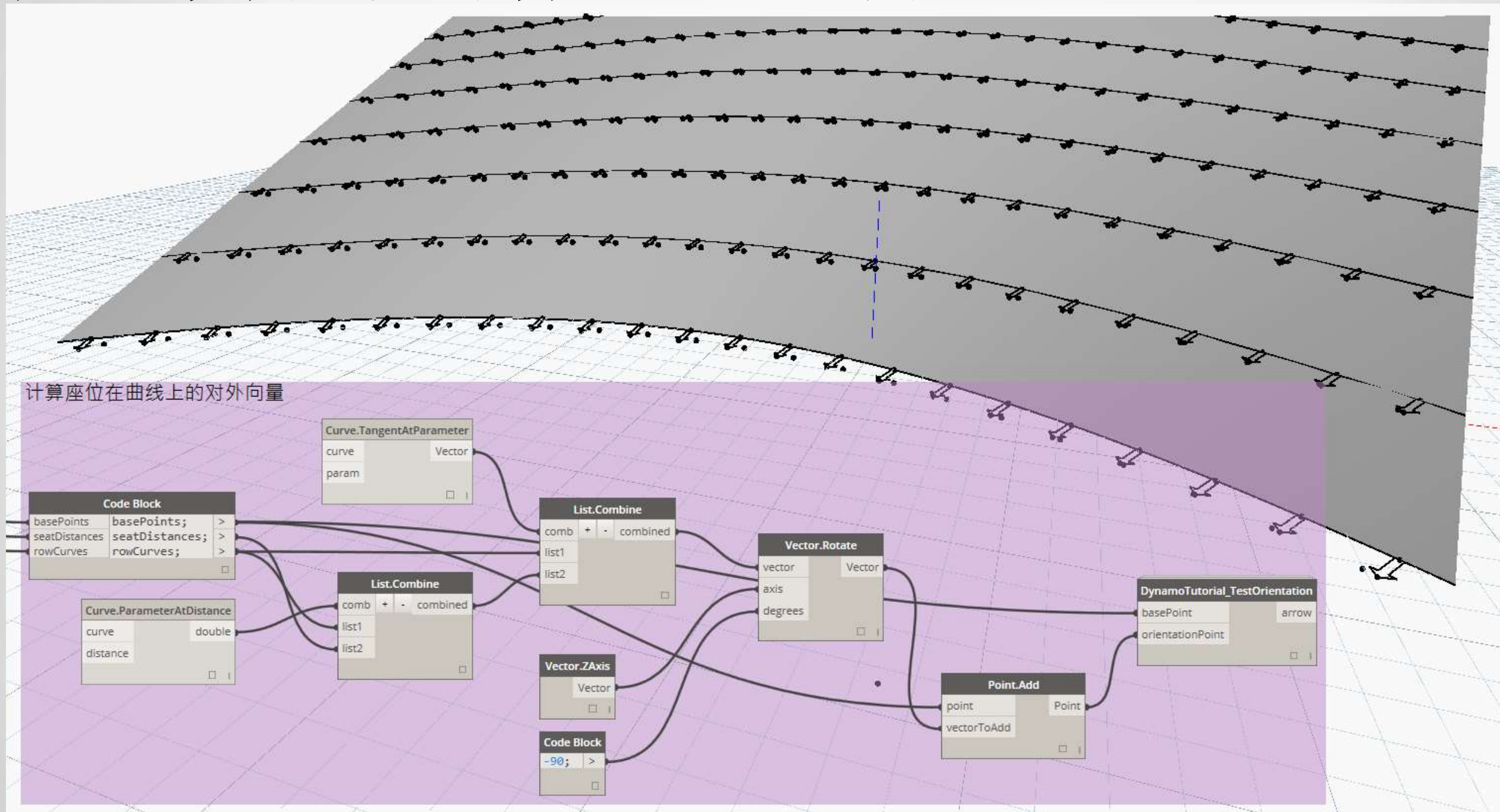
Curve.PointAtDistance

- 沿曲线获取特定弧长处



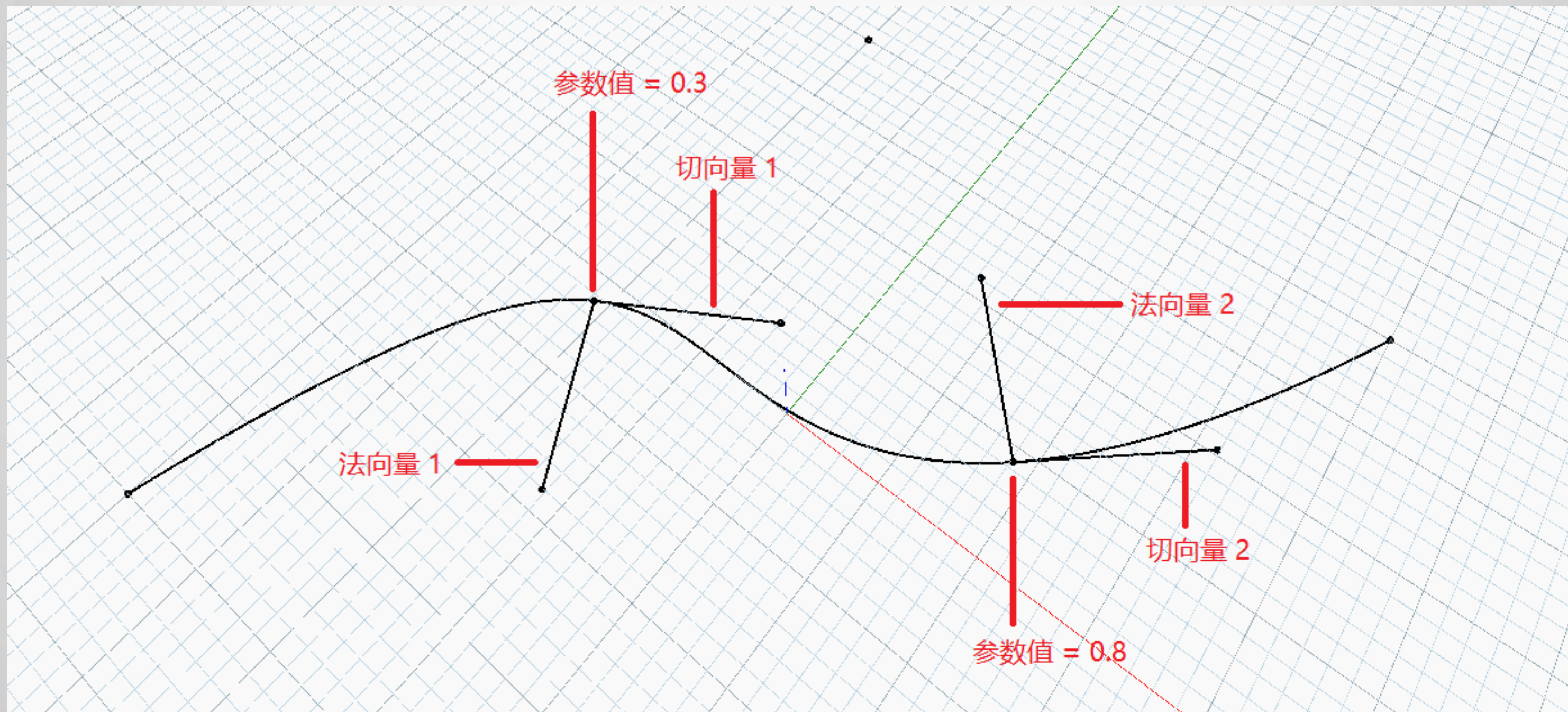
放置礼堂座位

- 找出每个座位与讲台之间的向量 (Revit)

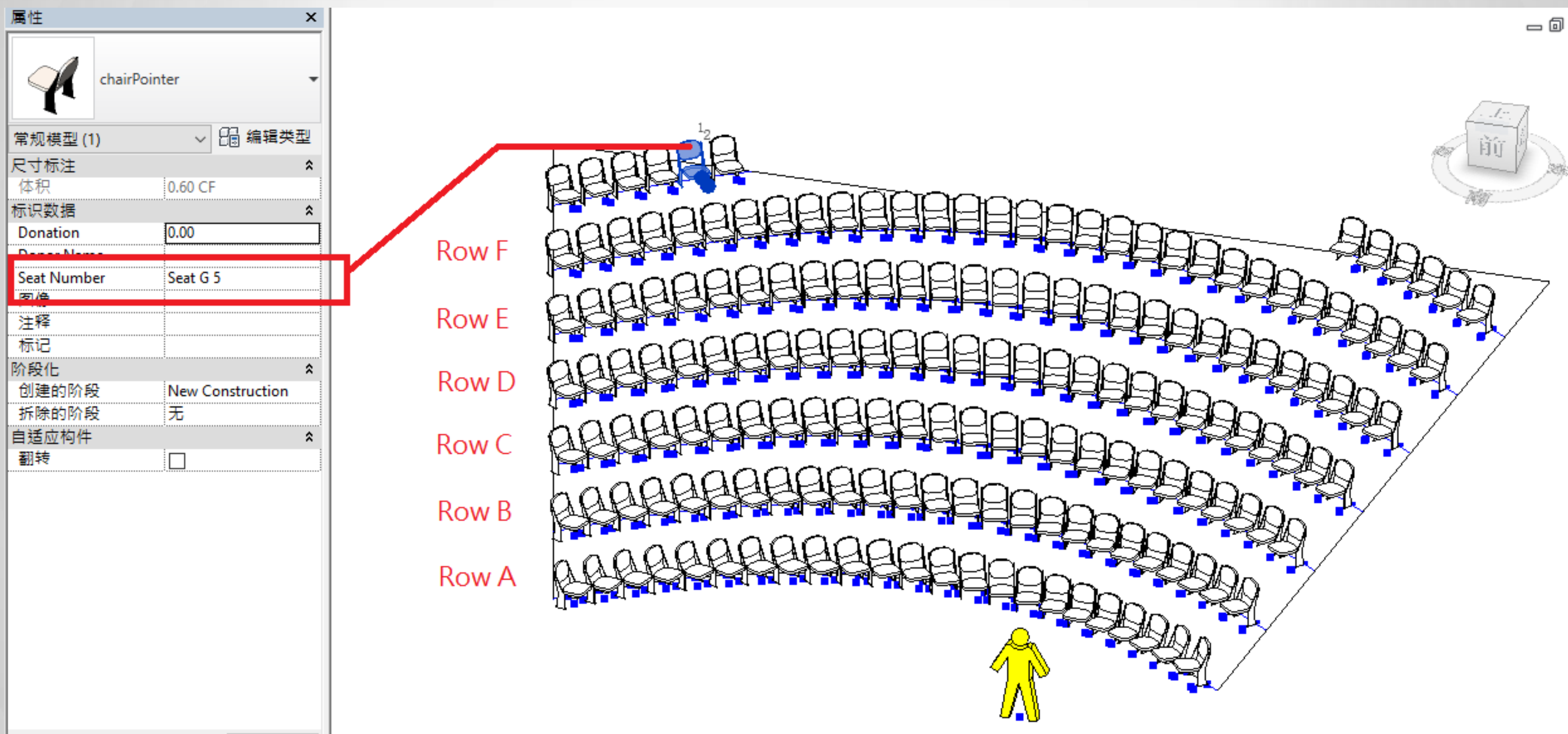


曲线法向量和切向量的差别

- 法向量方向不统一，切向量方向固定



以标签 Seat A 1, Seat A2, ... 标识座位



把表格式数据映射到座位上

- 以 Excel.ReadFile 读取表格式数据
- 以 Element.SetParametersByName 设置参数值

The image shows a software interface with three main components:

- Excel Table:** A table with columns A and B. Row 173 is highlighted with a red box. The data in row 173 is: 173 Arcelia Akridge 100.00.
- Parameter Panel:** A panel titled 'chairPointer' with a red box around the 'Parameters' section. The parameters are: Donation: 100.00, Donor Name: Arcelia Akridge, Seat Number: Seat A 2.
- 3D Model:** A 3D model of a row of chairs. A red arrow points from the 'Seat Number' parameter to a specific chair in the model.

	A	B	C	D	E	F	G	H
165	Geraldine Garabedian	65.00						
166	Norma Nass	50.00						
167	Dayna Duca	30.00						
168	Shyla Spevak	25.00						
169	Ariel Aune	75.00						
170	Denna Ducote	55.00						
171	Josefine Jacques	5.00						
172	Jerilyn Johansen	75.00						
173	Arcelia Akridge	100.00						
174	Earlie Ewen	80.00						
175	Cassandra Corker	80.00						
176	Arla Amore	25.00						
177	Mae Maheux	10.00						
178	Kasie Kellog	5.00						
179	Carmen Chico	40.00						
180	Russell Rega	75.00						
181	Stephan Snedeker	35.00						
182	Laurena Loveridge	80.00						
183	Constance Chisholm	50.00						
184	Fletcher Forst	15.00						
185	Thanh Teed	40.00						
186	Eloisa Eby	70.00						

计算座位能见度

- 在Revit中以座位颜色深浅表示观众扭转角度

