SYNCHRO 4D Pro

Synchro Scripts

Script is a functionality to automate calculating and updating certain properties and values in a batch. In this session we will introduce examples of Synchro script to perform the following:

- Rename Tasks by Concatenation
- Set Appearance Profile
- User Fields
- Resource Planned Units assigned to Tasks
- Rules

Getting Started

To get started, we can explore the model by moving Focus Time through the schedule.

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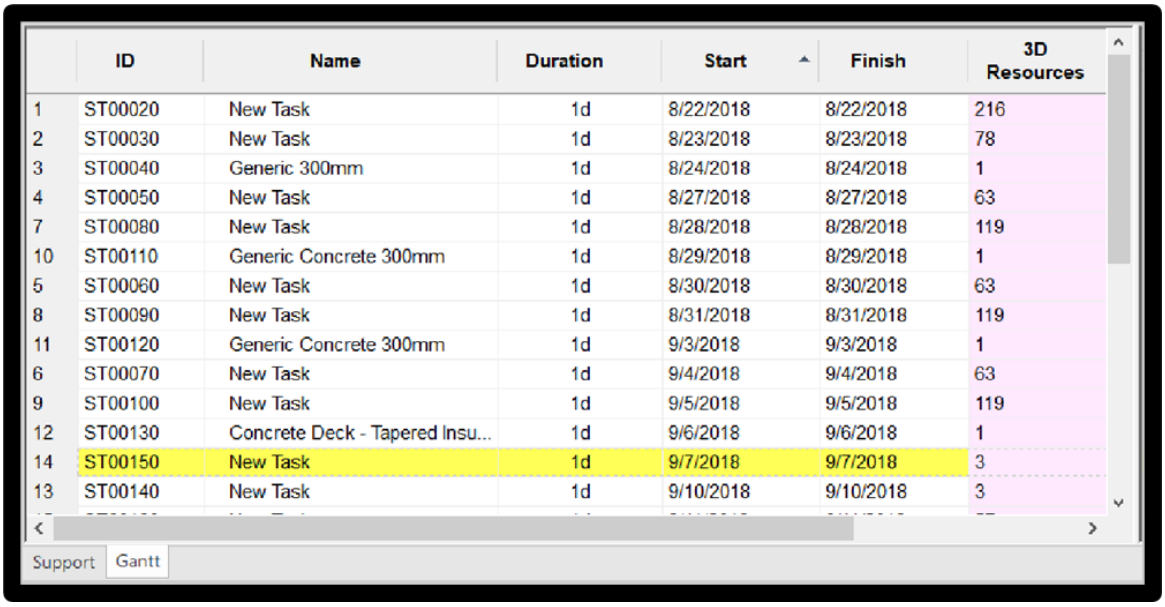
You will see **3D Resources** to be highlighted based on the on-going activities that they are assigned to. You can also find out:

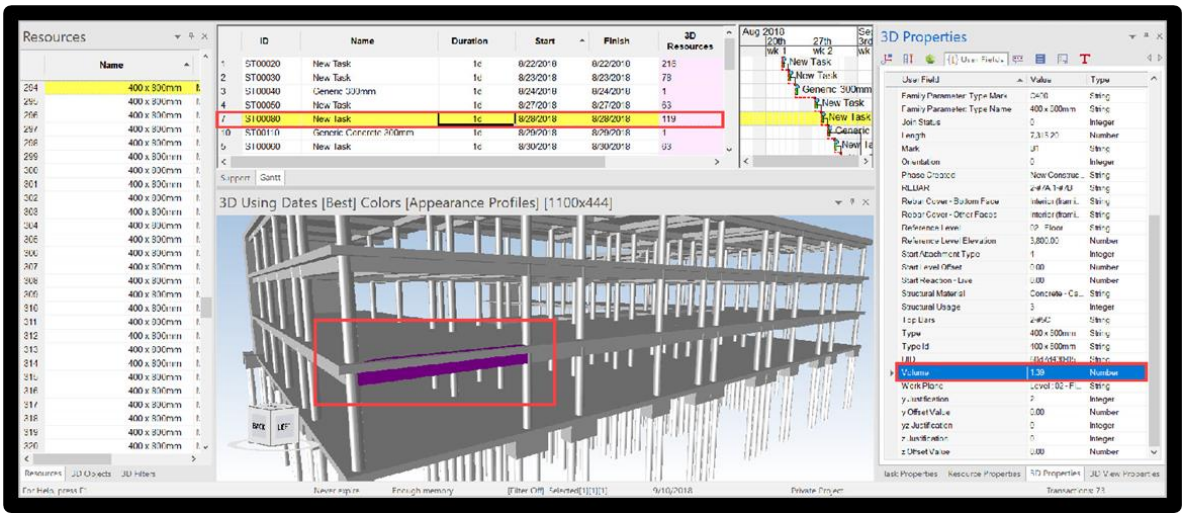
1. The schedule is only a draft which needs improvements for Task Names



	ID	Name	Duration	Start	Finish	3D Resources
1	ST00020	New Task	1d	8/22/2018	8/22/2018	216
2	ST00030	New Task	1d	8/23/2018	8/23/2018	78
3	ST00040	Generic 300mm	1d	8/24/2018	8/24/2018	1
4	ST00050	New Task	1d	8/27/2018	8/27/2018	63
7	ST00080	New Task	1d	8/28/2018	8/28/2018	119
10	ST00110	Generic Concrete 300mm	1d	8/29/2018	8/29/2018	1
5	ST00060	New Task	1d	8/30/2018	8/30/2018	63
8	ST00090	New Task	1d	8/31/2018	8/31/2018	119
11	ST00120	Generic Concrete 300mm	1d	9/3/2018	9/3/2018	1
6	ST00070	New Task	1d	9/4/2018	9/4/2018	63
9	ST00100	New Task	1d	9/5/2018	9/5/2018	119
12	ST00130	Concrete Deck - Tapered Insu...	1d	9/6/2018	9/6/2018	1
14	ST00150	New Task	1d	9/7/2018	9/7/2018	3
13	ST00140	New Task	1d	9/10/2018	9/10/2018	3

Support | Gantt

2. For all concrete tasks, Task UF ~Volume can be created and calculated as the sum of total volume of all assigned Resources. This is because the 3D-Resource-Task relationships are already established, i.e., this is a linked 4D model.



3. There are two main types of materials used in this model: steel and concrete.

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Rename Tasks by Concatenation

1. Create a TXT file > Save your script in it;

   Script can be saved as a TXT file and then opened to be run later.

   TASK SET_PROPERTY (NAME, "Install " + UFV("Category") + " - " + "Level " + UFV("Level"))

   This script renames all the tasks to the concatenated string.

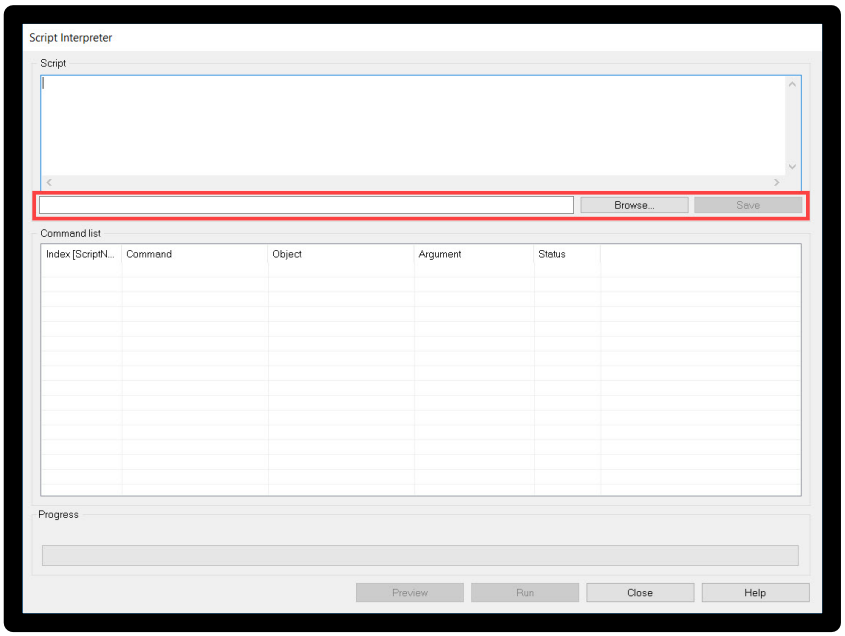
   Here are some explanations:

   The basic format of one line of script is <Object> (Condition) <Command>.

   In this script:

   - Object: TASK - all tasks in the project;
   - Command: SET_PROPERTY (PROPERTY NAME, Value) - Changes all Task Names to the string concatenated with the strings "Install ", " - ", "Level " and task UFV Category, Level.

2. Select All Tasks > "Project Control" Ribbon >Script>Browse to open the script file;



Our usual practice is to select open a saved script. You can **edit** it in the script window and click "Save" to save your changes.

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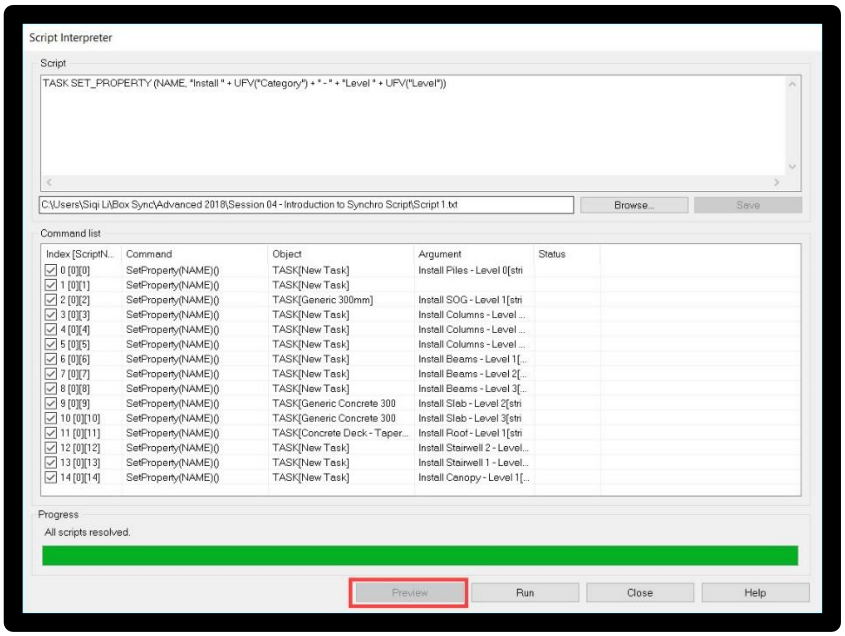
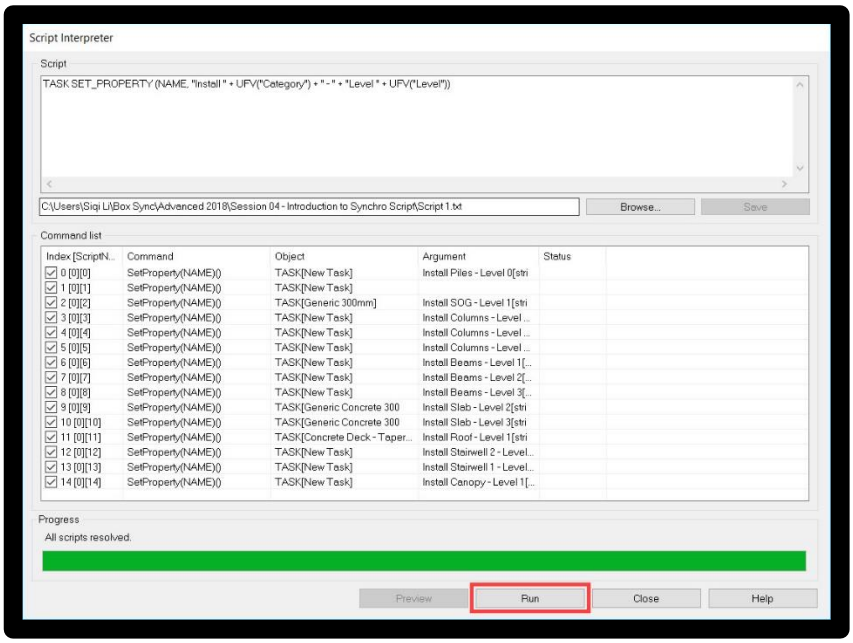
3. Preview to Check > Run





When we go back to the Gantt Chart we can see all the task names have been modified.

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Assign Task UFVs

In this part we would like to calculate the total concrete volume of each task, summarizing the "Volume" User Field of all assigned resources.

1. Create a newTXT file> Save your script in it;

TASK(SELECTED) ASSIGN_UF("Total Volume", FLOAT,
SUM(RESOURCE(TYPE==ENUM:MATERIAL).UFV("Volume"))

This script sums the values of Resource User Field "Volume" for all Resources assigned to the task and assigns it to the Task UF "Total Volume".

Here are some explanations:

The basic format of one line of script is <Object> (Condition) <Command>.

In this script:

- Object:

TASK/RESOURCE/3D OBJECT - Perform the operation for all tasks that satisfy the conditions;

- Condition:

SELECTED - Returns True if the Task or Resource is selected;

TYPE==ENUM:MATERIAL - TYPE returns the Resource Type as a number: UNKNOWN = 0, EQUIPMENT=1, HUMAN=2, LOCATION=3, MATERIAL=4; ENUM:MATERIAL returns the Material Resource Type as an integer;

- Command:

TASK/RESOURCE/3D OBJECT.UFV("UserField Name") - Return the value of the specified user field as the appropriate data type (Time, Duration, String, Number, Boolean);

SUM() - Return the sum of all valid elements from the argument;

ASSIGN_UF("UF Name", UF_TYPE, Value) - Assign value for UF if it does not exist when the command is 'running' or change the existing current UFV;

2. Select All Tasks>Project Control>Script>Browse to open:

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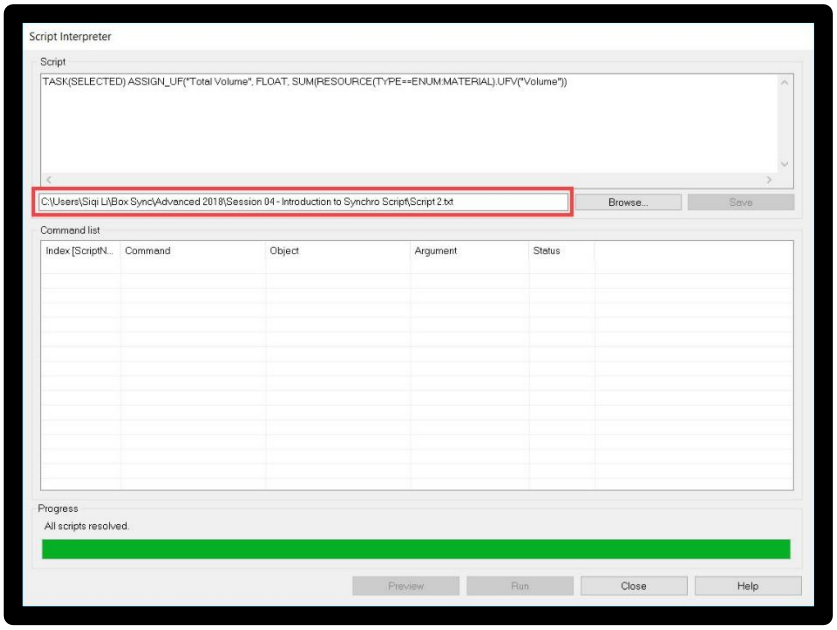
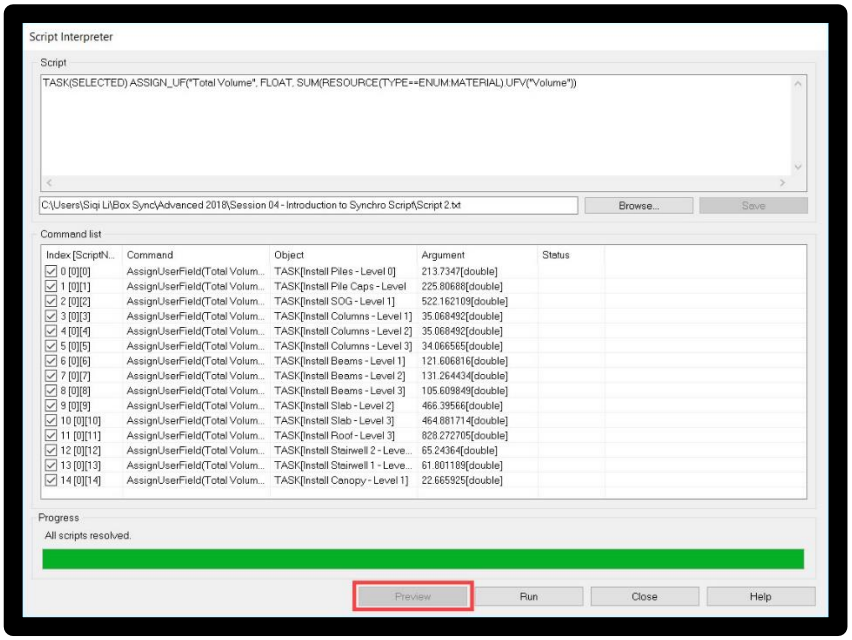


3. Preview to Check > Run;



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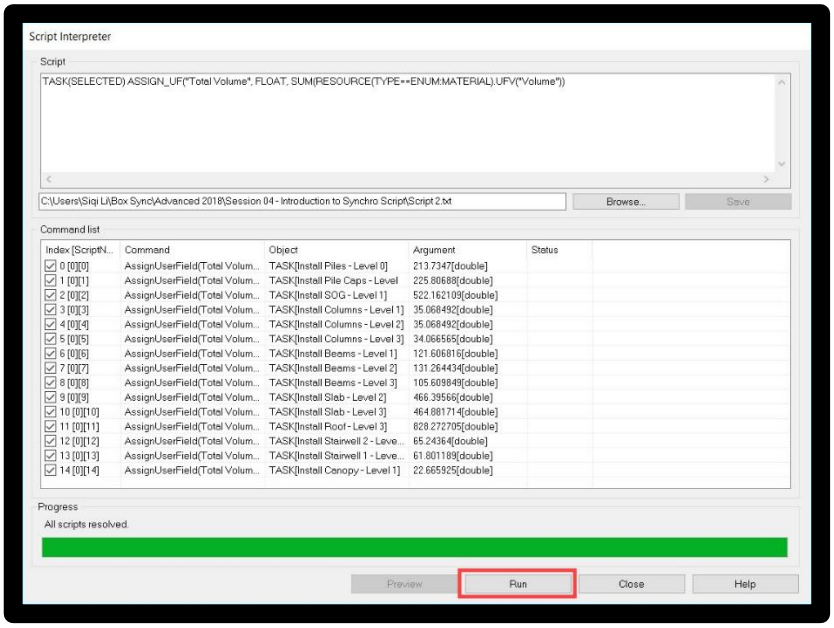
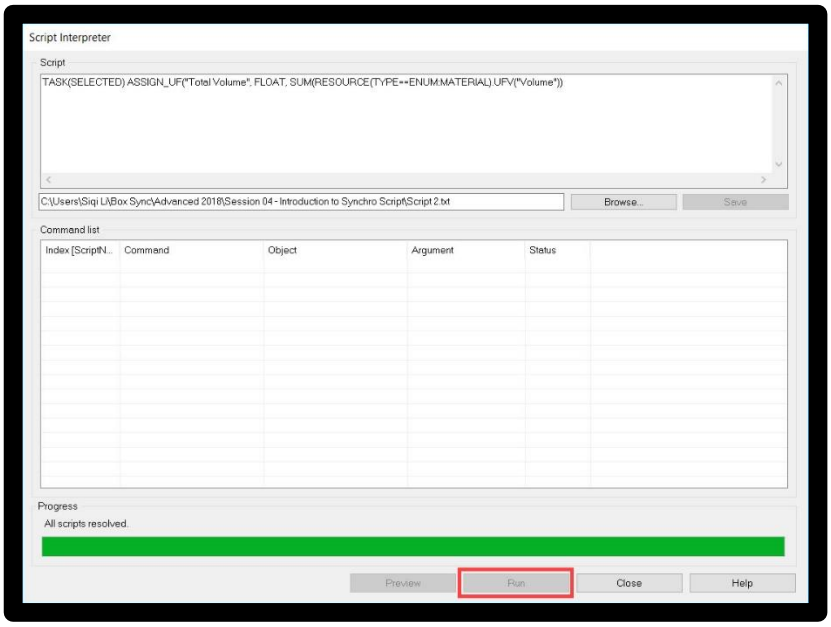


When we go back to the User Field panel we can see a new User Field "Total Volume" is created under Task UF. We can customize columns to check.

If you see the following window after you click "Preview" where the "Run" button is greyed out, please go back to the Gantt chart to make sure the tasks that you need are selected.



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Setting Resource Appearance Profiles

1. Create a TXT file save your scriptin it ;

TASK.ASSIGNMENT (RESOURCE.UFV("Structural Material")>="Concrete" OR RESOURCE.UFV("Type")>="Concrete" OR RESOURCE.UFV("Material")>="Concrete") SET_PROPERTY (PROPERTY("Appearance Profile"), ALL_USE_PROFILE(NAME == "Concrete"))

The basic format of one line of script is <Object> (Condition) <Command>.

In this script:

- Object:

TASK.ASSIGNMENT - When applied to a Task, returns all the assigned Resources with access to the assignment properties.

- Condition:

RESOURCE.UFV("Structural Material")>="Concrete" OR RESOURCE.UFV("Type")>="Concrete" OR RESOURCE.UFV("Material")>="Concrete";

>= - returns TRUE if the second string is contained inside of first (Case-senstive);

OR - Returns TRUE if any (at least one) arguments are true, or FALSE if all arguments are false.

NAME == "Concrete": == - Returns TRUE if two statements are equal.

- Command:

TASK/RESOURCE/3D OBJECT.UFV("UserField Name") - Return the value of the specified user field as the appropriate data type (Time, Duration, String, Number, Boolean);

SET_PROPERTY (PROPERTY NAME, Value) - Changes all (Appearance Profile in this case) properties to the appearance profile that satisfies the conditions you set.

2. Create Appearance Profile "Concrete"

Be aware that if you do not create an appearance profile here, the script will not be run.

3. Preview to Check > Run;

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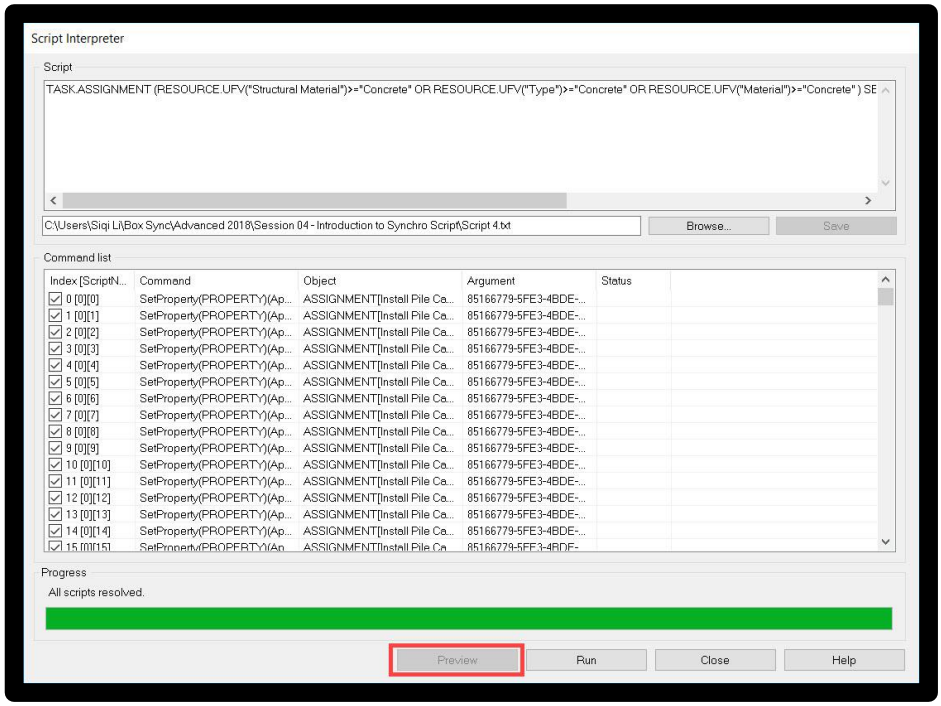

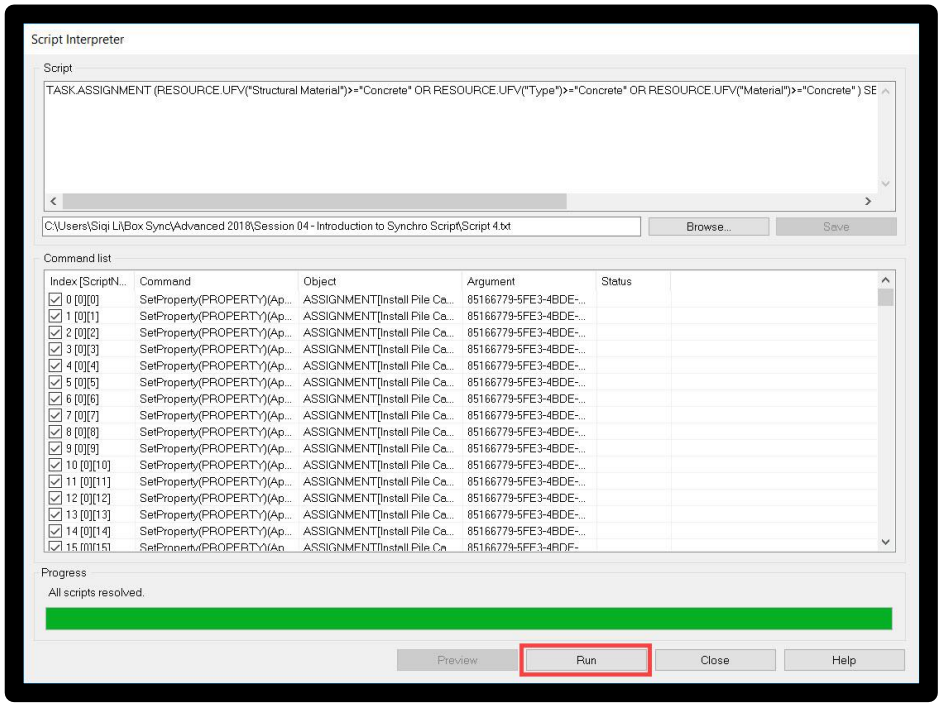

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Synchro Scripts (Video)

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