
Lab 4. Flow control, variables, expressions

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Author: Serge Luca, aka “Doctor Flow”

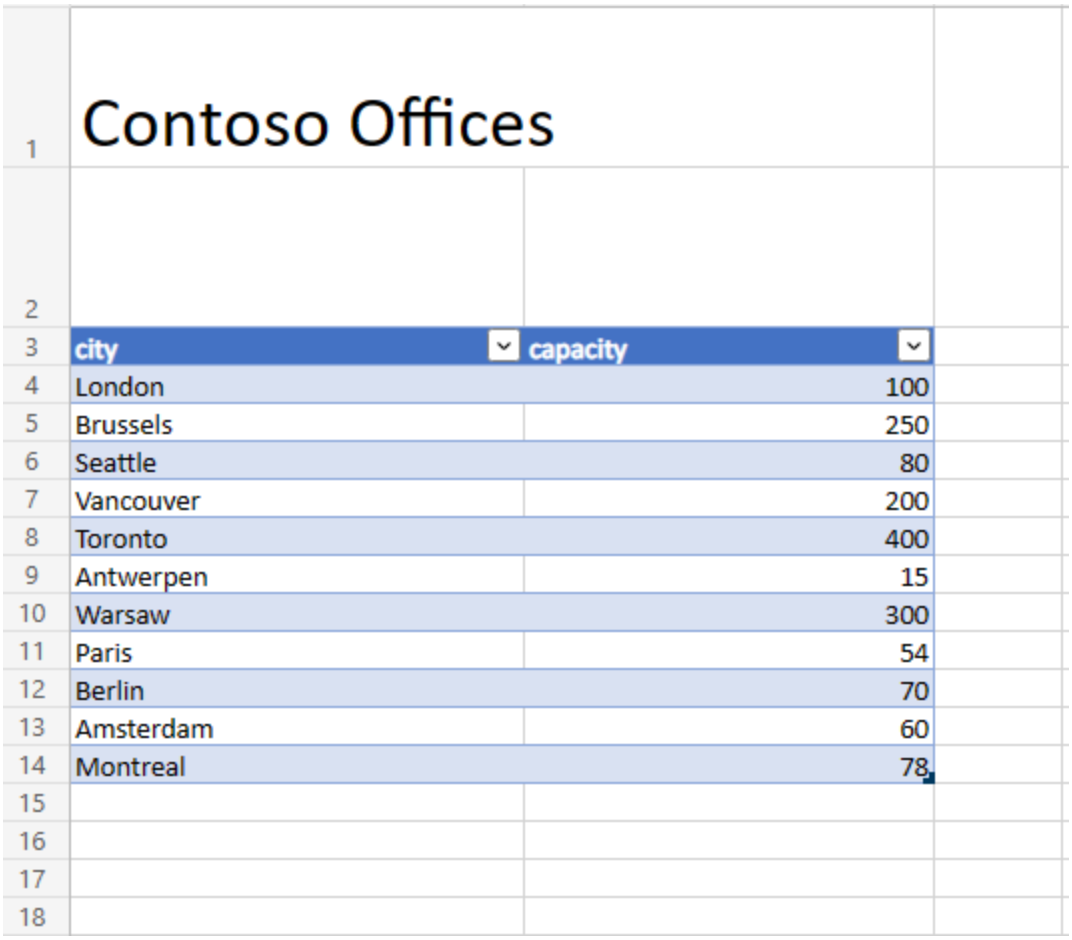
Learning objectives: Flow control, expressions, variables, using Date/Time

Duration: 50 minutes.

Scenario: We have a list of offices in an Excel sheet. Create a Flow that will send a report describing this list of offices, including the biggest office.

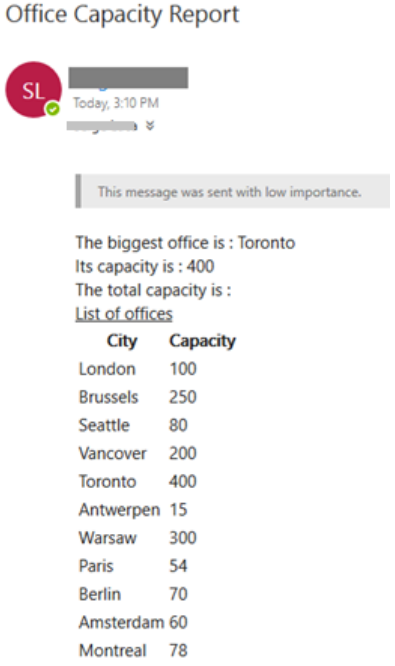
Task 4.1: Create an Excel workbook and a scheduled flow

1. Create an Excel workbook to use in this lab.
    a. In your One Drive (for Business), create an Excel workbook named **Offices.xlsx**.
    b. Add two columns like the screenshot below, with the cities and capacities data, and then format the data as a table with headers:



	Contoso Offices	
1		
2		
3	city	capacity
4	London	100
5	Brussels	250
6	Seattle	80
7	Vancouver	200
8	Toronto	400
9	Antwerpen	15
10	Warsaw	300
11	Paris	54
12	Berlin	70
13	Amsterdam	60
14	Montreal	78
15		
16		
17		
18		

Note: This document contains the list of offices of Contoso Corp. Each office has a limited number of seats.
Every month a report describing the list of offices and the total number of seats is sent to the management (in this case the management is…yourself). The e-mail should look like this:


Office Capacity Report

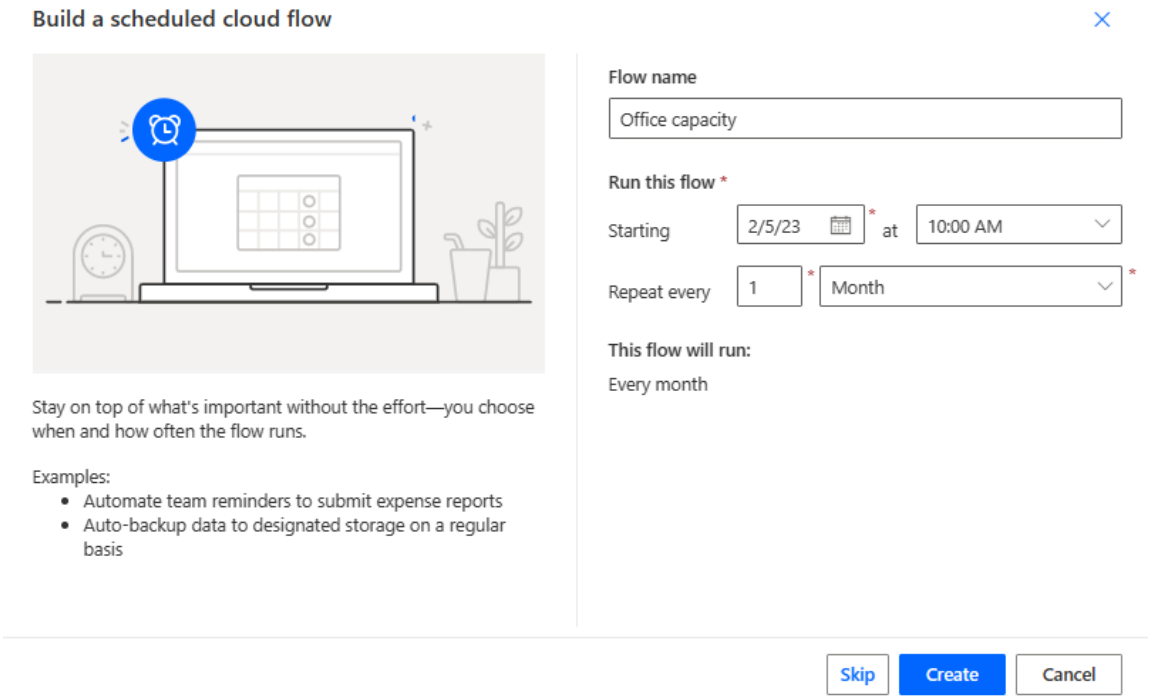
SL [redacted]
Today, 3:10 PM

This message was sent with low importance.

The biggest office is : Toronto
Its capacity is : 400
The total capacity is :
List of offices

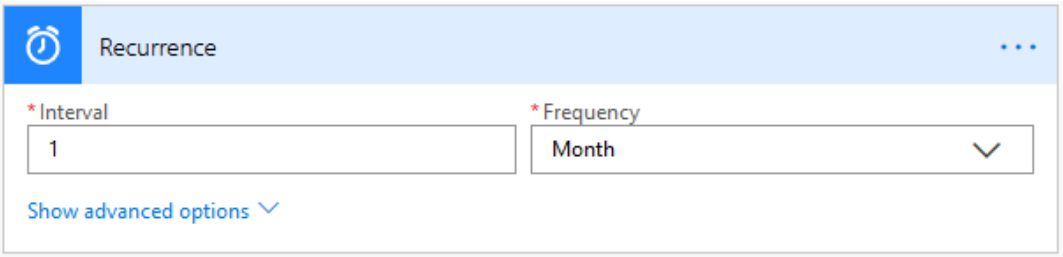
City	Capacity
London	100
Brussels	250
Seattle	80
Vancover	200
Toronto	400
Antwerpen	15
Warsaw	300
Paris	54
Berlin	70
Amsterdam	60
Montreal	78

2. Create a flow to generate this e-mail report.
    a. Create a **New flow** > **Scheduled cloud flow**
    b. Use the following screenshot to name the flow, and set the flow frequency.

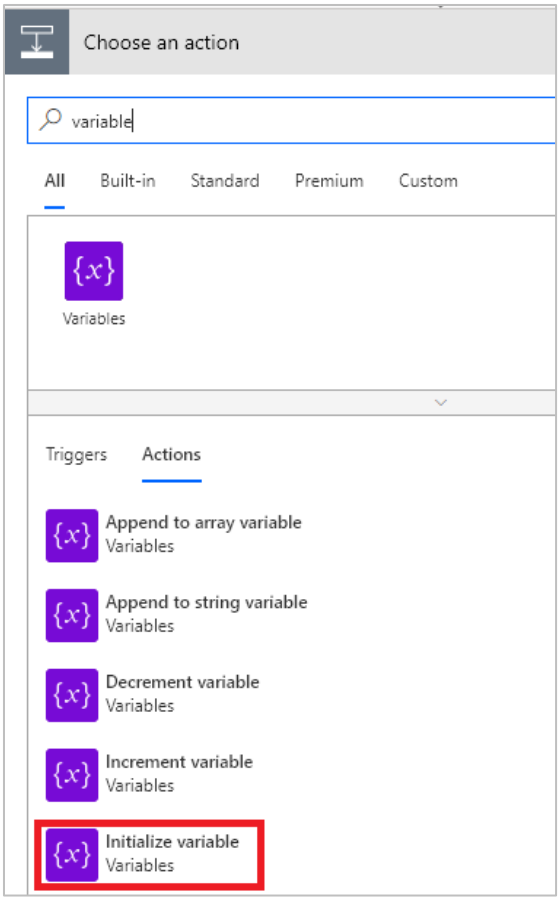


c. Click **Create**.

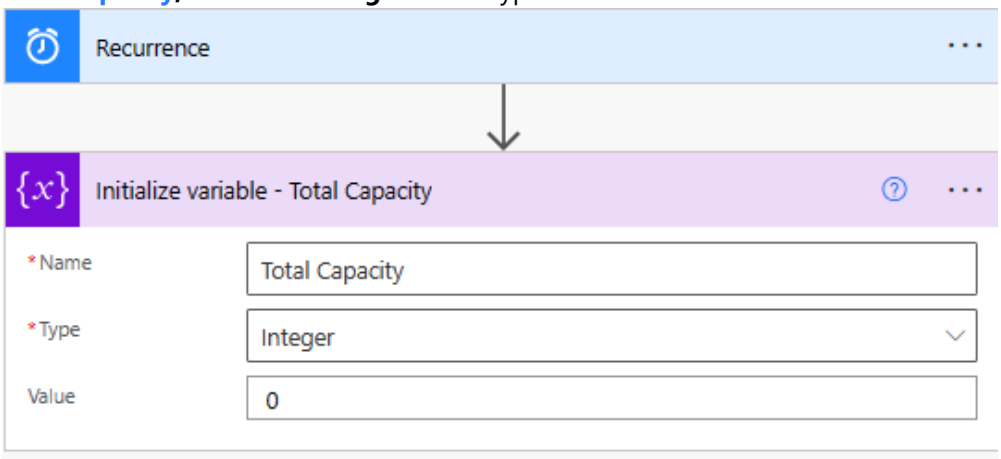
The following flow will be generated:



3. The first challenge will be to define the **Total capacity**. Use the following steps to create a variable that will contain that value.
   a. Select **New Step** and select **Initialize variable**:



b. Rename this action to **Initialize variable Total capacity**, set the variable name **Total Capacity,** and select **Integer** as the type with an initial **Value** of **0**:

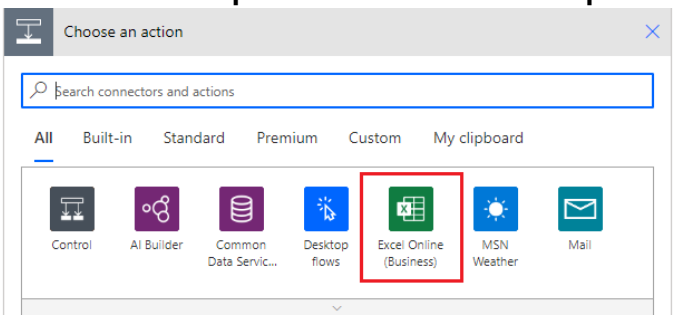


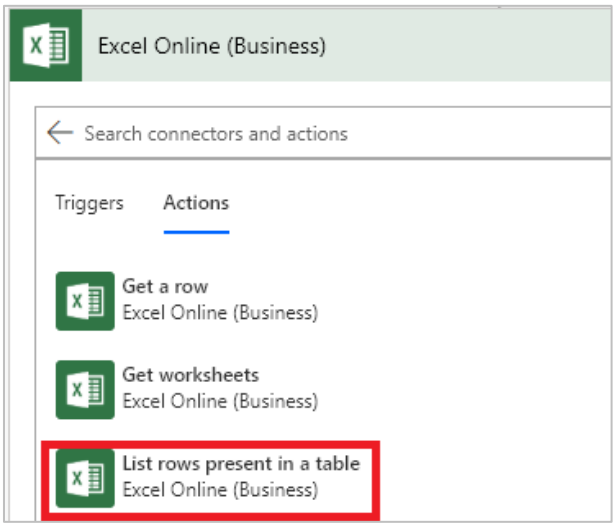
4. Click on **Save** button to **Office Capacity** flow .

Task 4.2: Extend the flow to loop through all offices

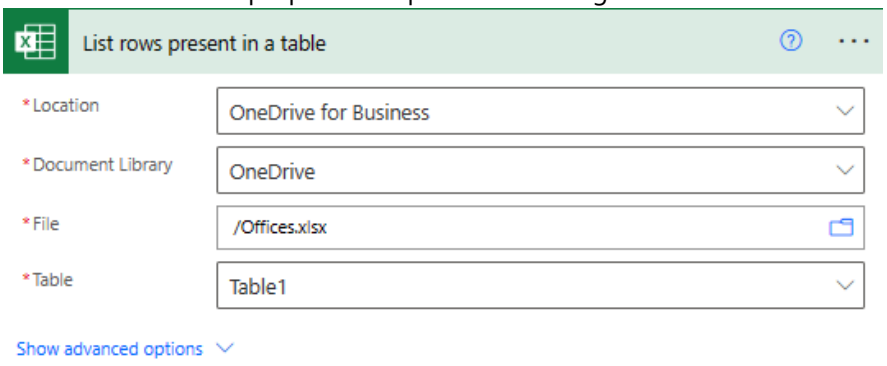
In this task, you will make it loop through all offices, retrieve their capacity, and increment the Global Capacity variable to calculate the total capacity.

1. To retrieve the list of offices.
    a. **Select New step** > **Excel Online** > **List rows present in a table**:

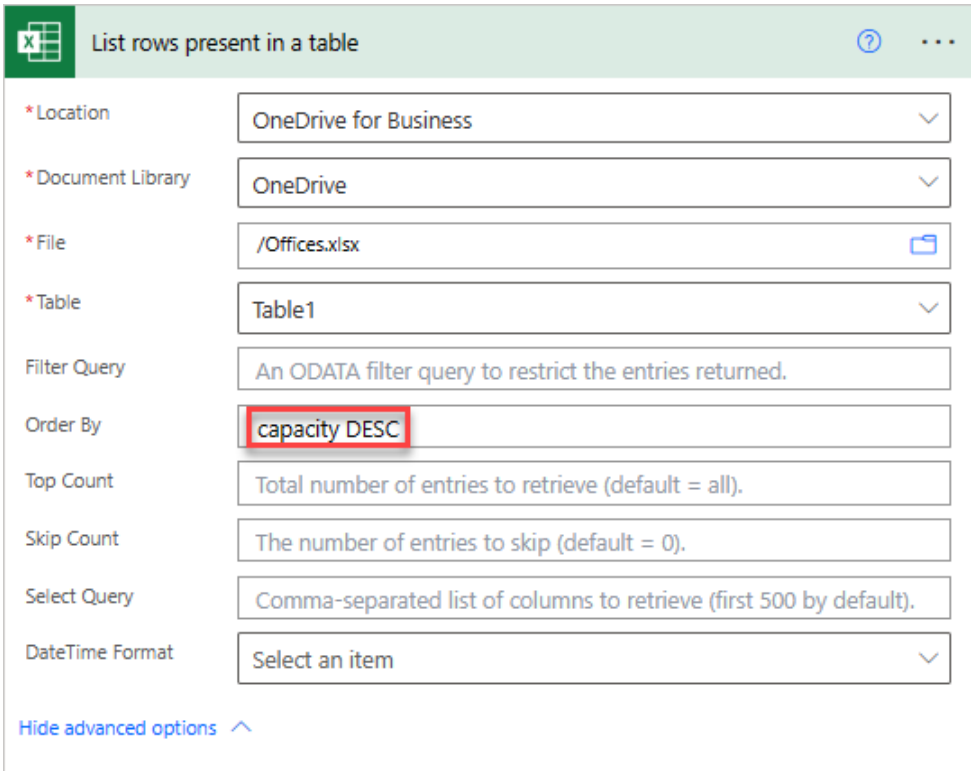




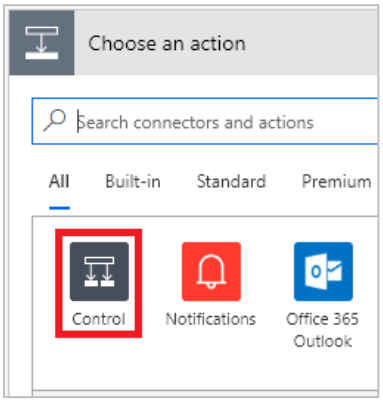
    b. Set the Excel action's properties as per the following screenshot:



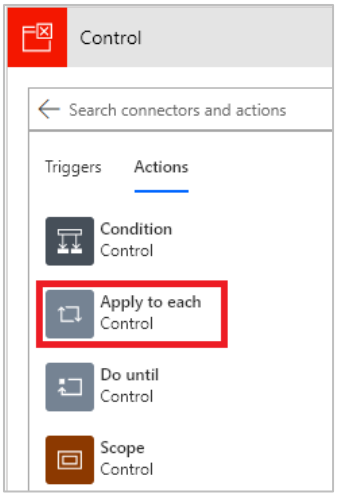
    c. Click **Show Advanced option** and type **capacity DESC** in the **Order By** field:



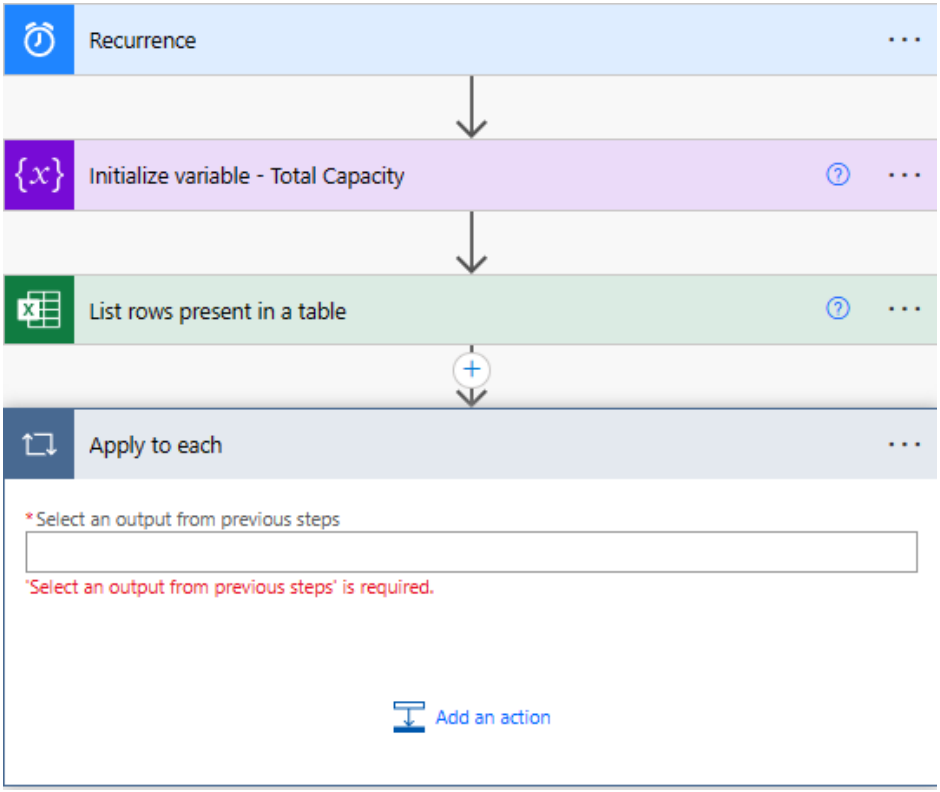
2. Loop through the cities
    a. **Select New step** > **Control**



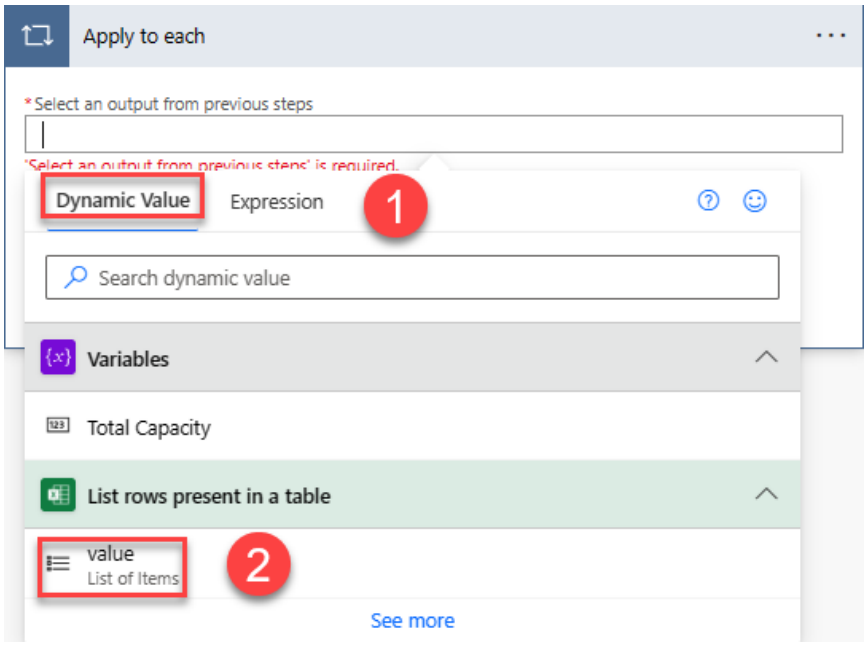
    b. Click **Apply to each:**



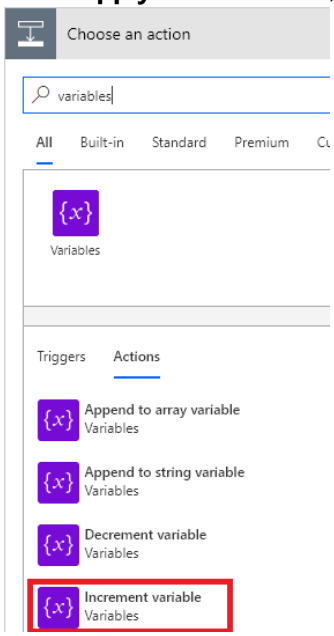
Your flow should now look like this:



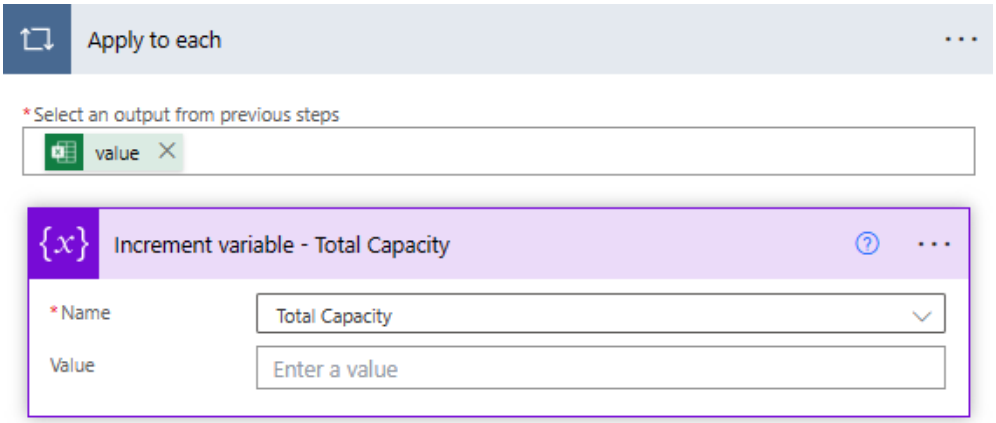
3. Configure the **Apply to each** action (it expects a list of values), using the "Add a dynamic value" to select the **value** property from the **List rows present in a table** action.



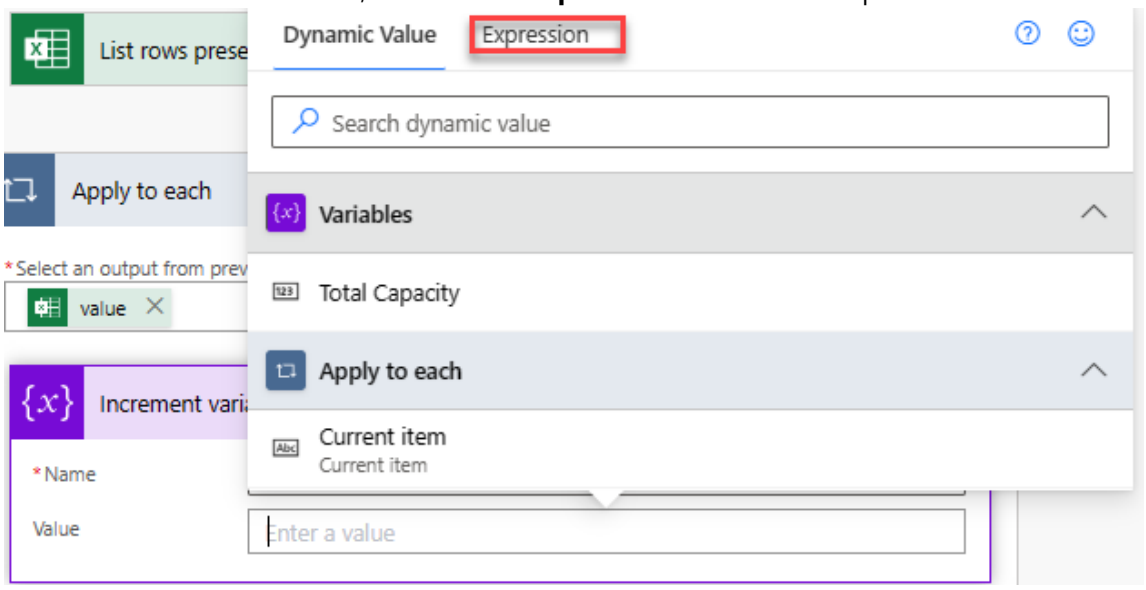
4. Calculate the current office capacity using a variable and an expression.
    a. In the **Apply to each** action, click **Add an action** > **Increment variable**:



    b. In the **Name** drop-down list, select **Total capacity**, and rename the action:

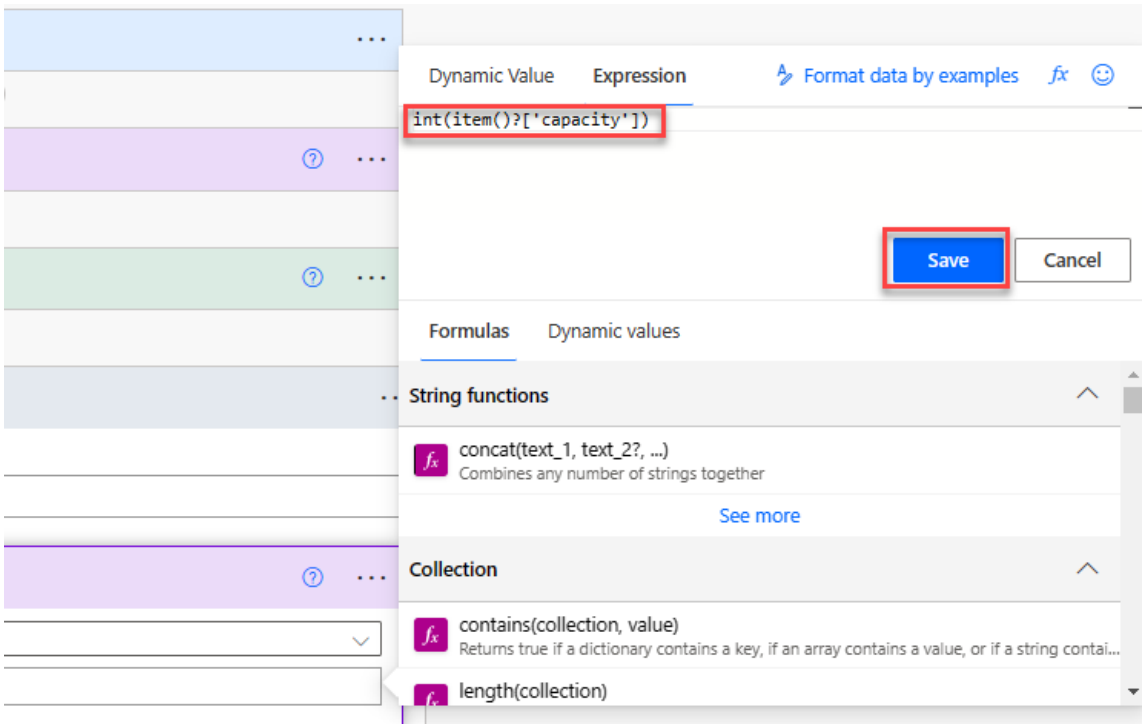


c. Click inside the **Value** text box, and click the **Expression** tab to add an expression



d. Type the following expression: and don't forget the click **Save**:

int(item()?['capacity'])

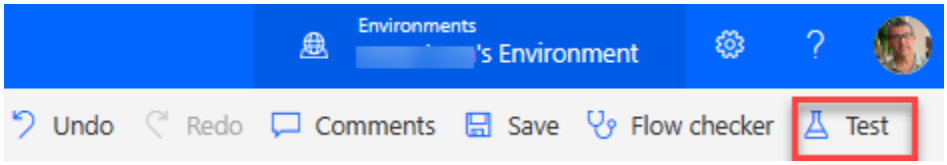


Note:

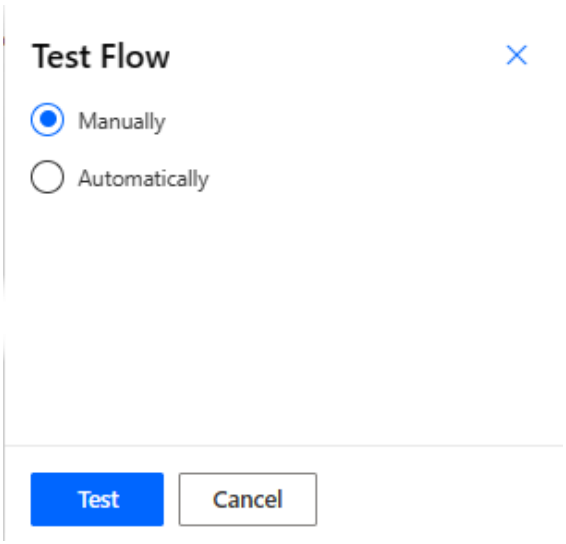
The **item()** expression retrieves the current record information in the current loop, and **['Capacity']** provides the field name to retrieve. **Item()['Capacity']** returns a string. The question mark ? akes your code more robust by avoiding it crashing if there is no such field (here 'capacity') in the record. The information coming from Excel is a string, and we need to transfer it as a number to increment it to the variable **Total capacity**. To transform a string to an integer (), we use the **int()** function.

There are many other expressions available in Power Automate, and we encourage you to read the documentation related to expressions after doing the labs. You can start from the following web page, https://powerautomate.microsoft.com/en-us/blog/use-expressions-in-actions/. The list (reference) of all functions can be found here: https://learn.microsoft.com/en-us/azure/logic-apps/workflow-definition-language-functions-reference

5. To test the flow, without waiting one month before it starts, use the **Test** button to manually start the flow on demand (in test mode). This is convenient for testing and debugging purposes.
    a. Click **Test**.

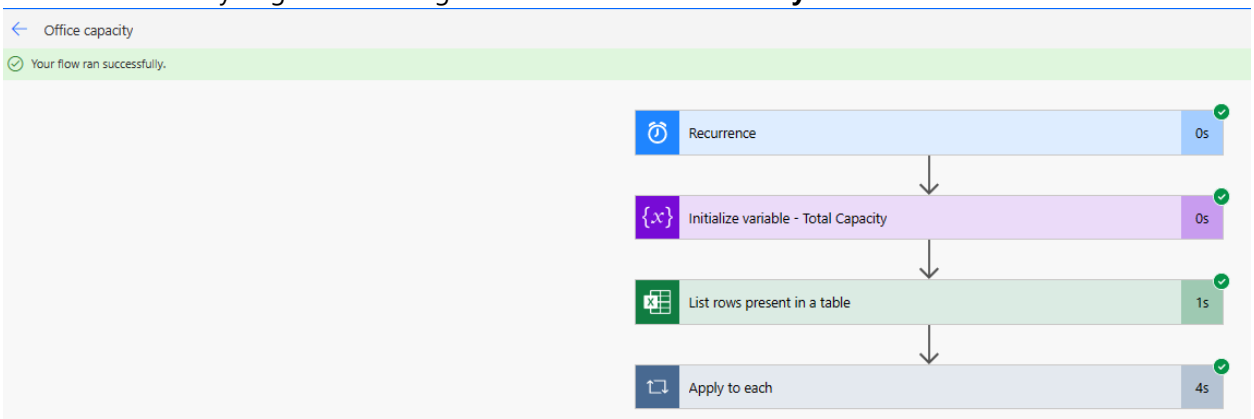


    b. Select **Manually**:

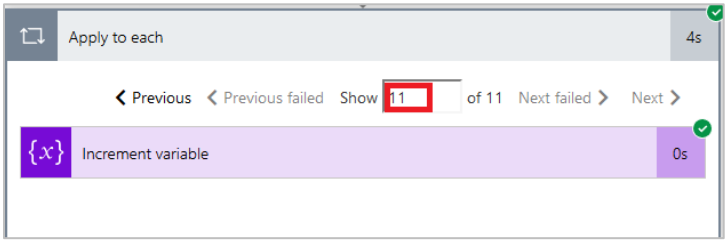


c. Click on **Run Flow**, and **Done**.

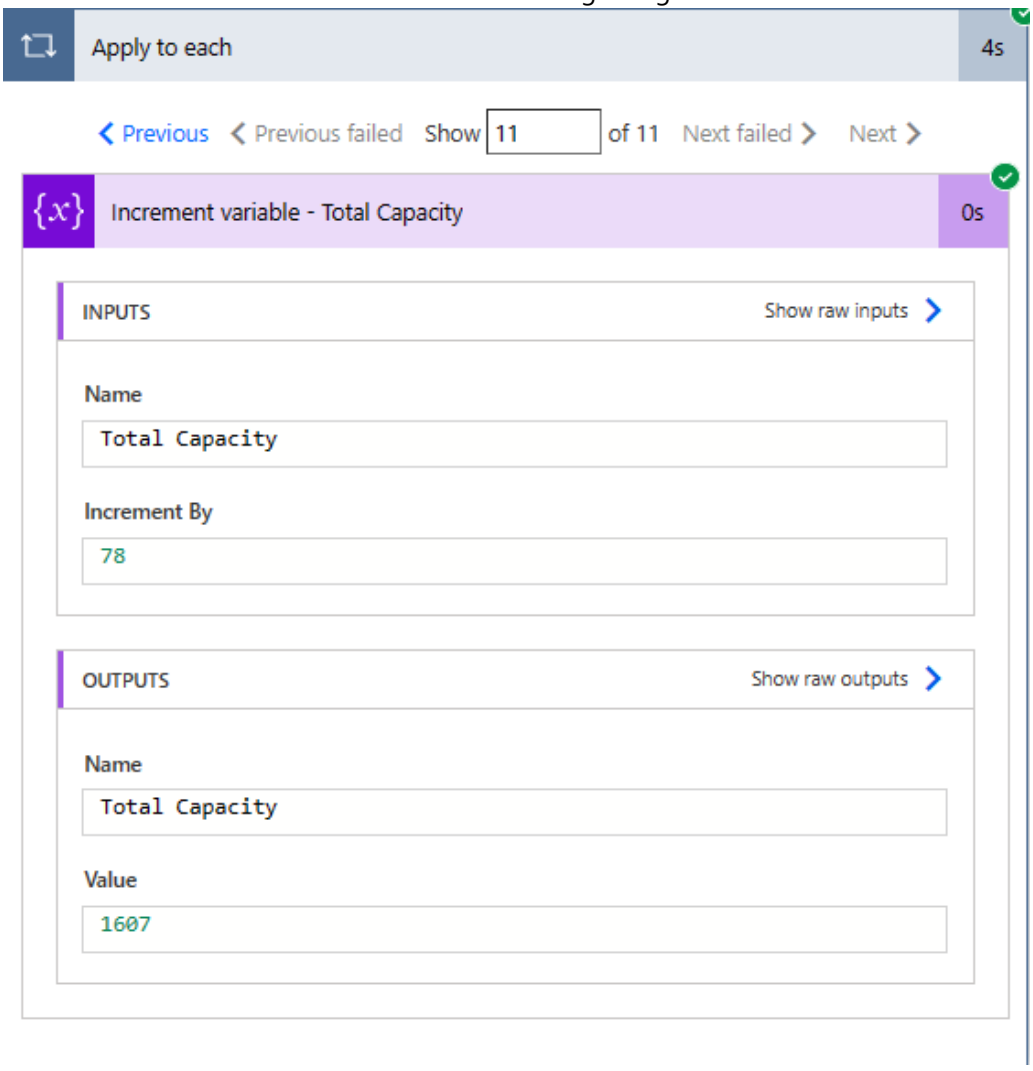
d. Wait until you get the message: **Your Flow ran successfully.**



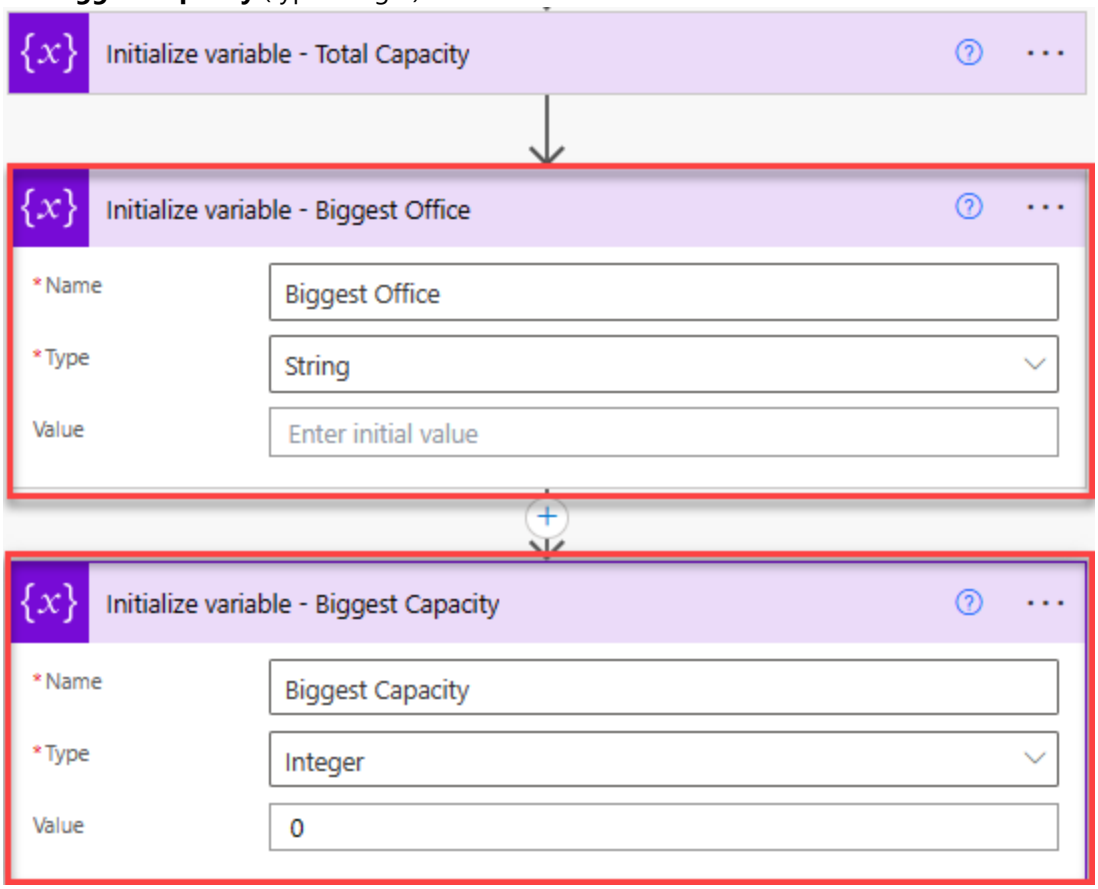
To check the **Total Capacity** value, you can examine the value of **Total capacity** for each step. For example, in our case, we will check its value once it has completed the loop 11 times: so, type **11** In the **Show** textbox:



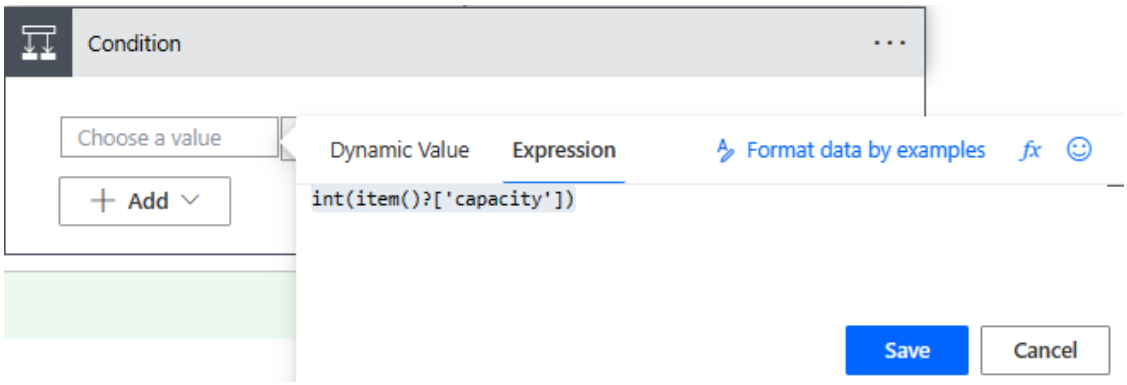
e. Click **Increment variable – Total Capacity** to display a value of **1607** (if you use the values in the Excel workbook as defined at the beginning of the lab.



6. Define 2 new variables
    a. Below the variable, **Total capacity** and before the loop, add two new variables named:
        - **Biggest office** (type string)
        - **Biggest capacity** (type integer)

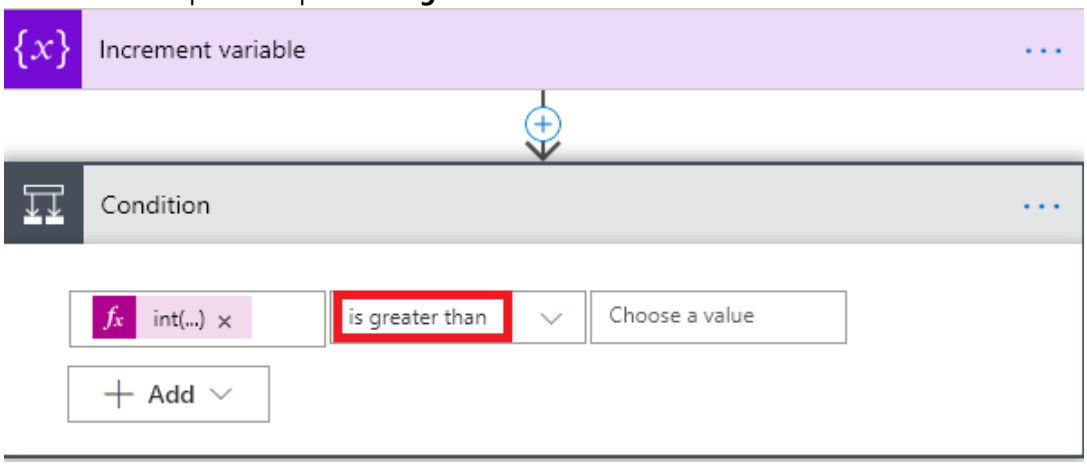


7. **Add a Condition** (from) the Control connector) in the **Apply to each** action:
8. The goal is to compare two numbers and select the larger one. To do so, we need to transform our capacity values into integers. On the left side of the condition, click **Choose a value** and click on **expression**. As we already did it before, type **int(items()?['Capacity'])** as illustrated below:

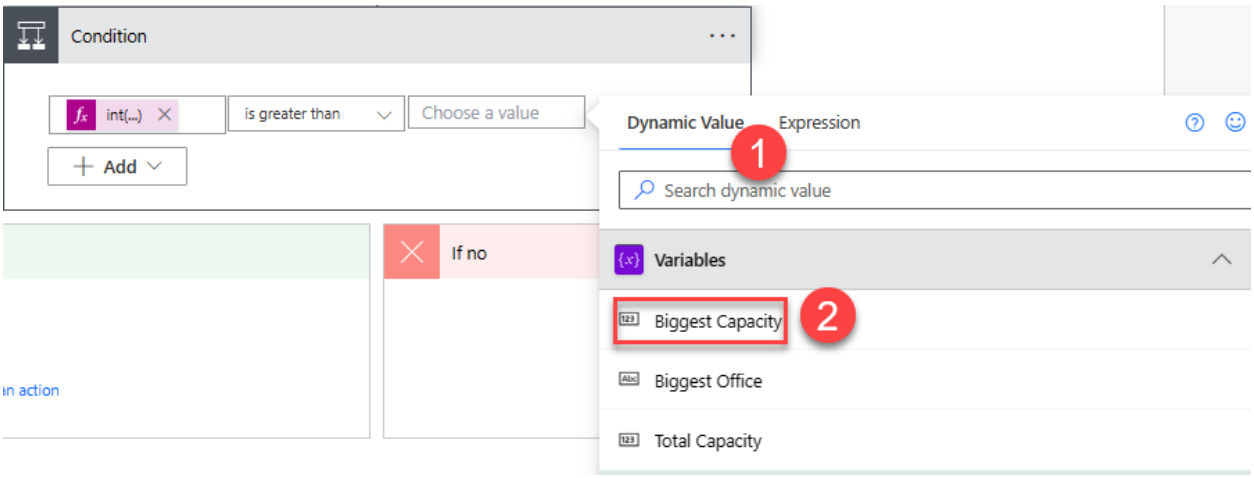


9. Click **Save.**

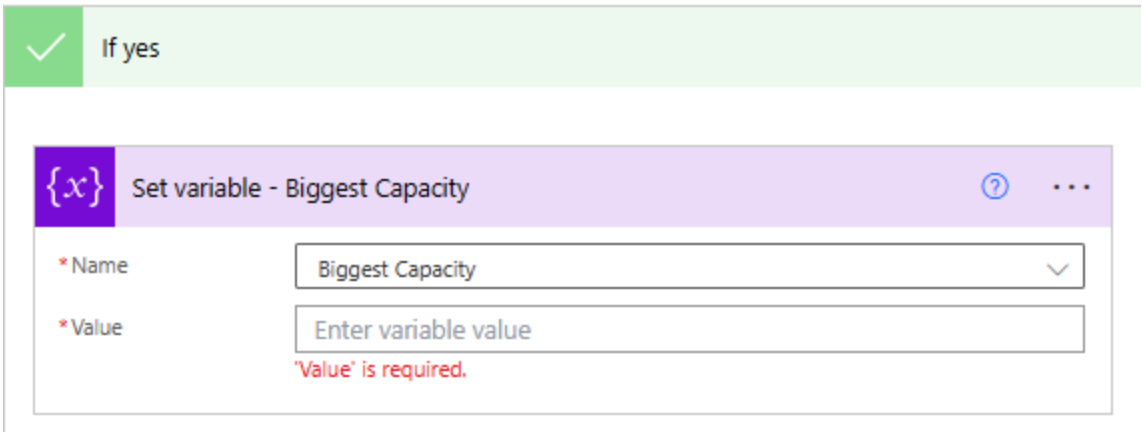
10. Select the comparison operator **is greater than**:



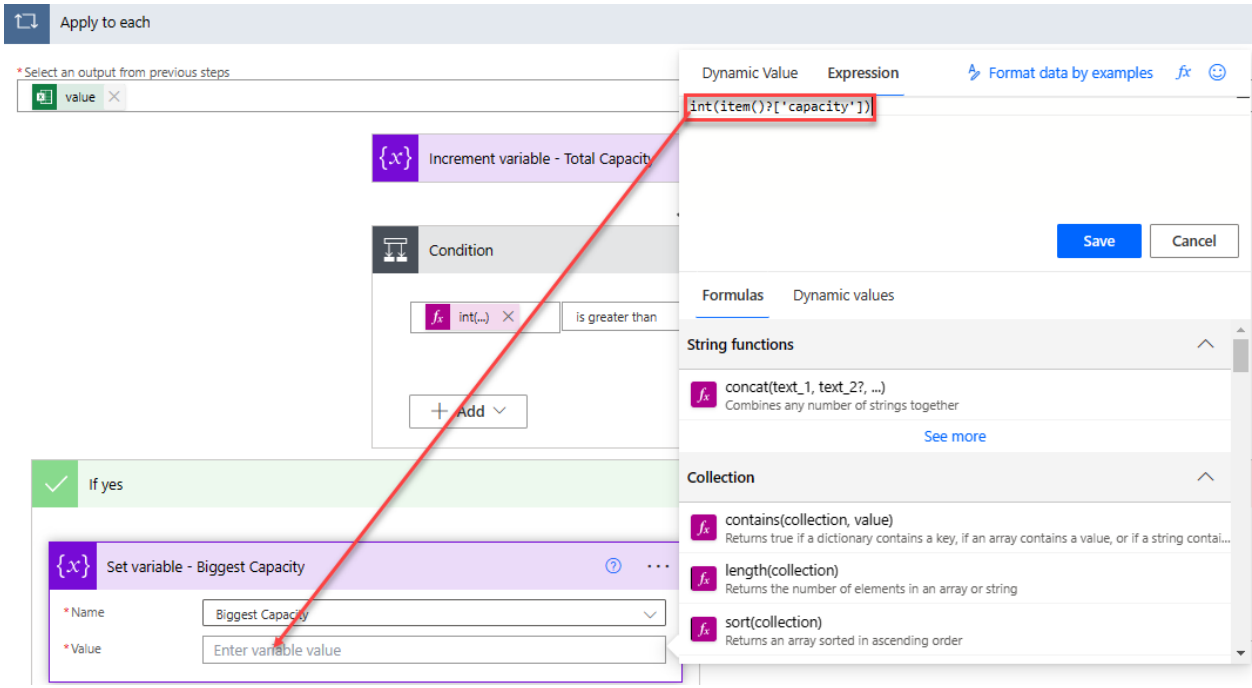
11. In the **Choose a value** textbox, select the **Dynamic value** – **Variables** – **Biggest Capacity** :



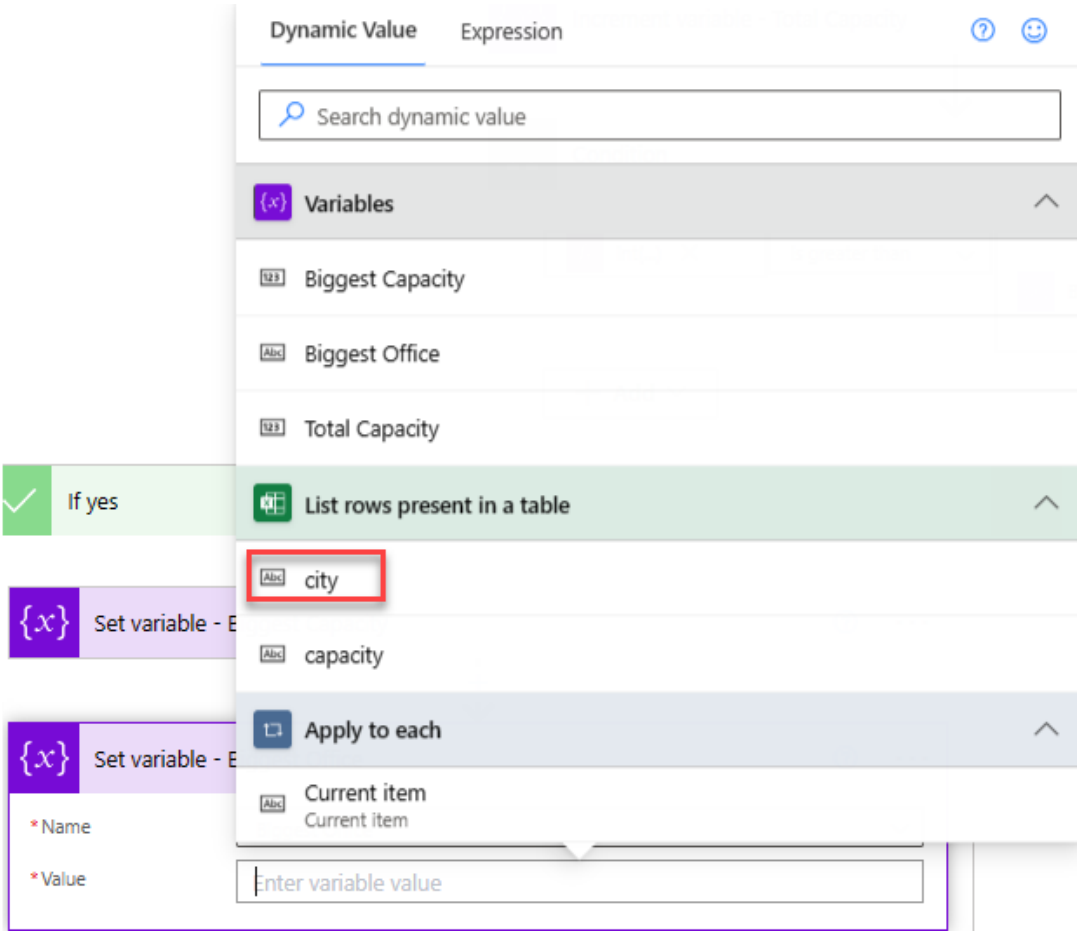
12. Now, in the left **If yes** branch, add a new action **Variables – Set variable** for our **MaxCapacity** variable.
13. Rename the action **Set variable – Biggest Capacity:**



14. and in the **Expression** panel type of this variable **int(items()?['Capacity'])** as illustrated in the next picture.

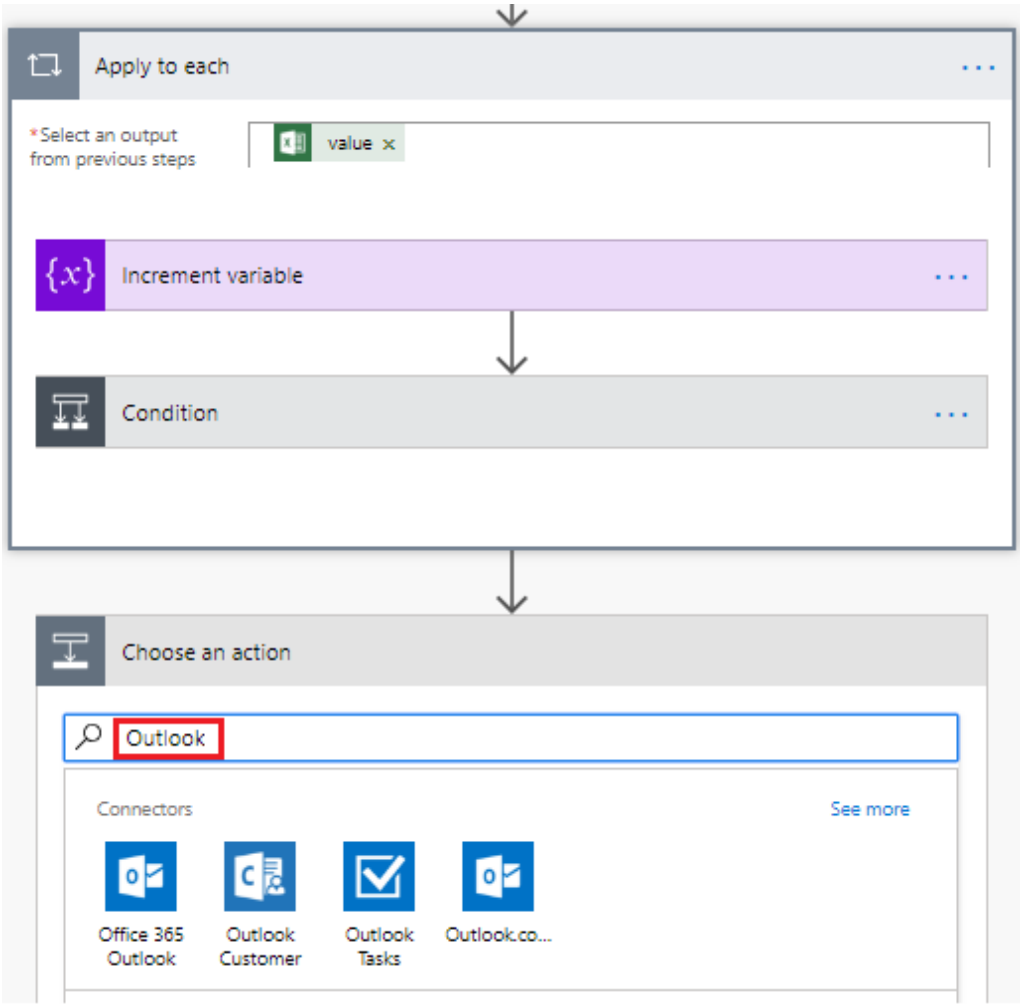


15. In the same left branch of the condition, add another **set variable action** and select the variable **Bigger Office** and assign it a value of **city**. Click on the Dynamic value button to retrieve city:

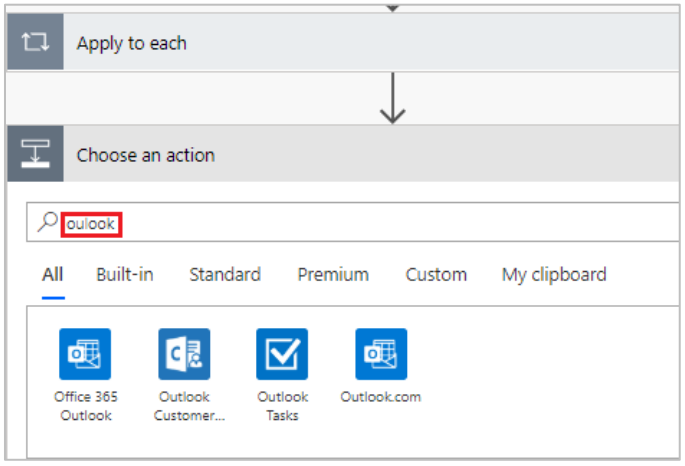


Or, as an alternative, you can create an expression with **item()?['city']**

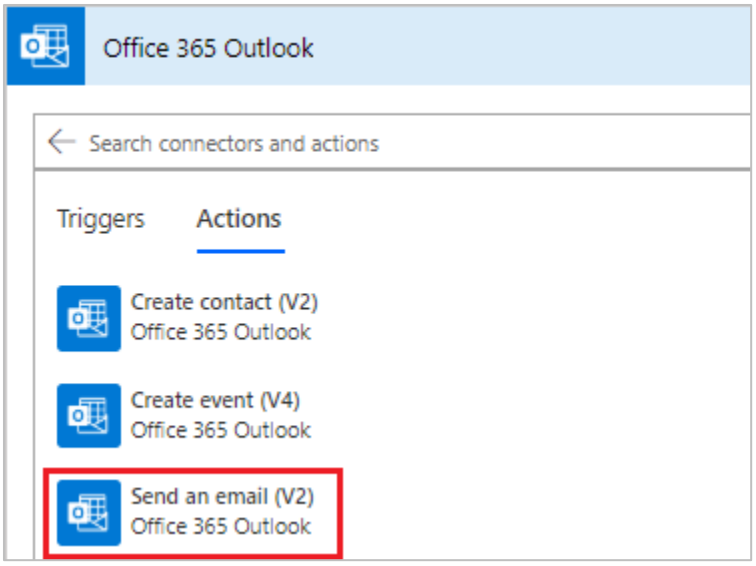
16. Save and test the flow to determine which city has the bigger capacity (Toronto in our case). You can debug the flow or add a notification (or send an e-mail to yourself).
17. Next, let's send an e-mail by adding an **Outlook 365 Outlook - Send an e-mail (v2)** action **after the Apply to each:**
    a. Find the action by typing Outlook:



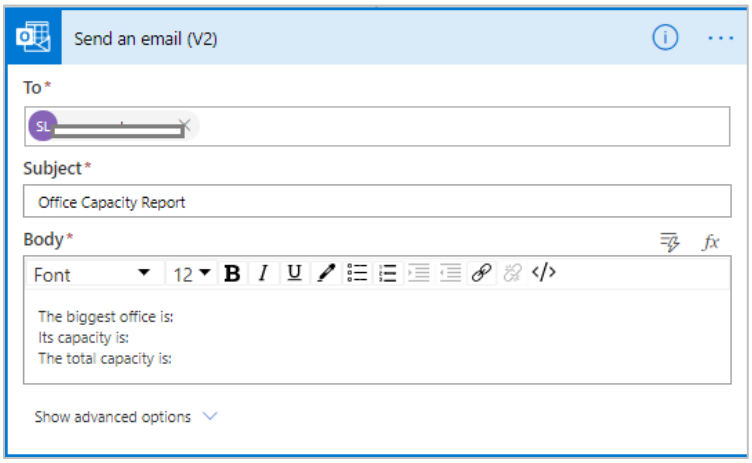
b. In the Connectors list click **Office 365 Outlook**:



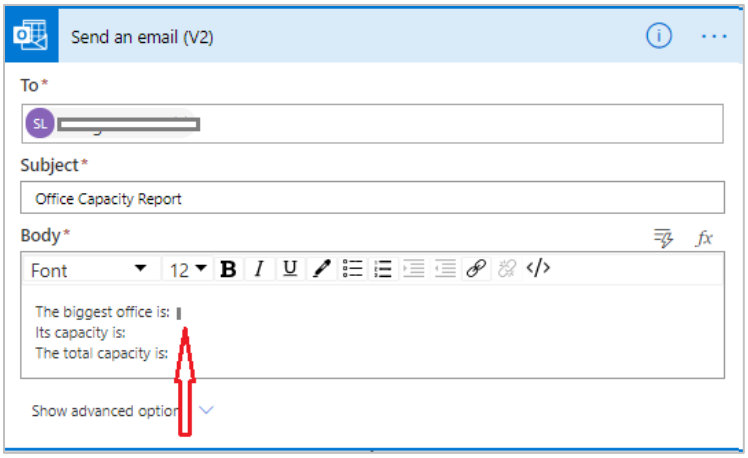
c. Select the action **Office 365 Outlook – Send an e-mail (V2)**:



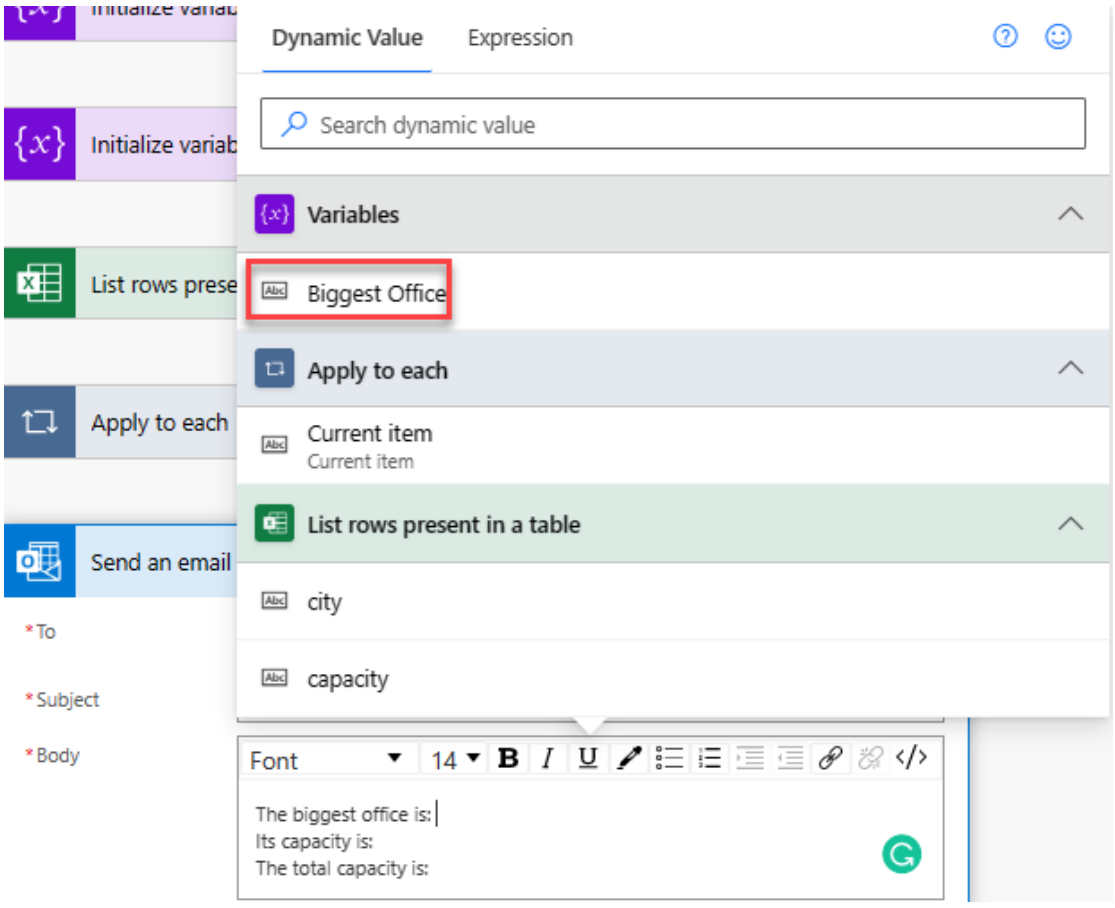
d. Fill-in the Send an e-mail action with the following values
   i. In the **To field** provide your e-mail address
   ii. In the **Subject**, type "**Office Capacity Report**."
   iii. In the **body** type the following text:



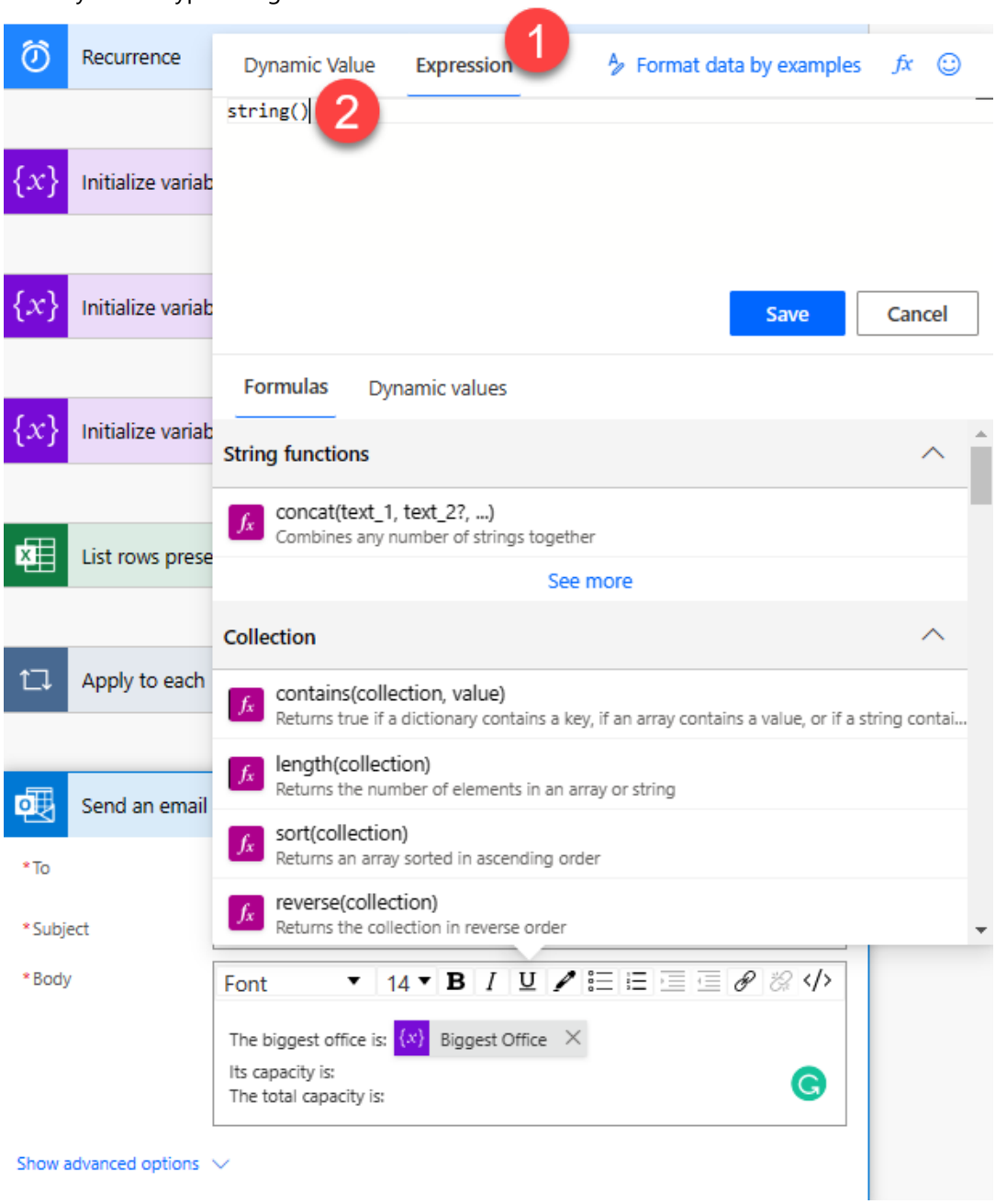
   iv. We will now add the variable's value directly in the **body**
   v. Move the cursor just after the colon of *The biggest office is:*



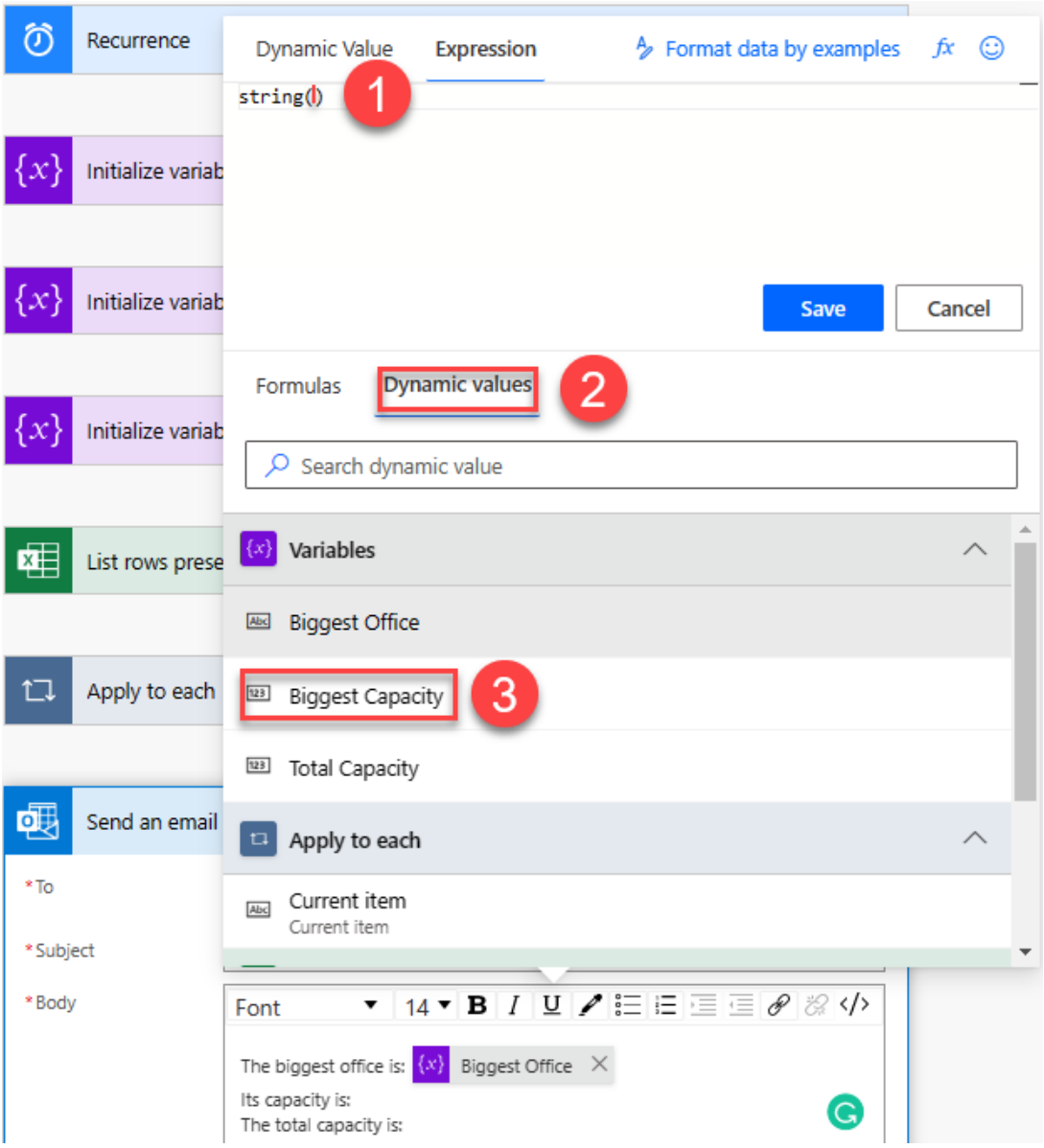
vi. Click Dynamic value and select the variable Biggest office:



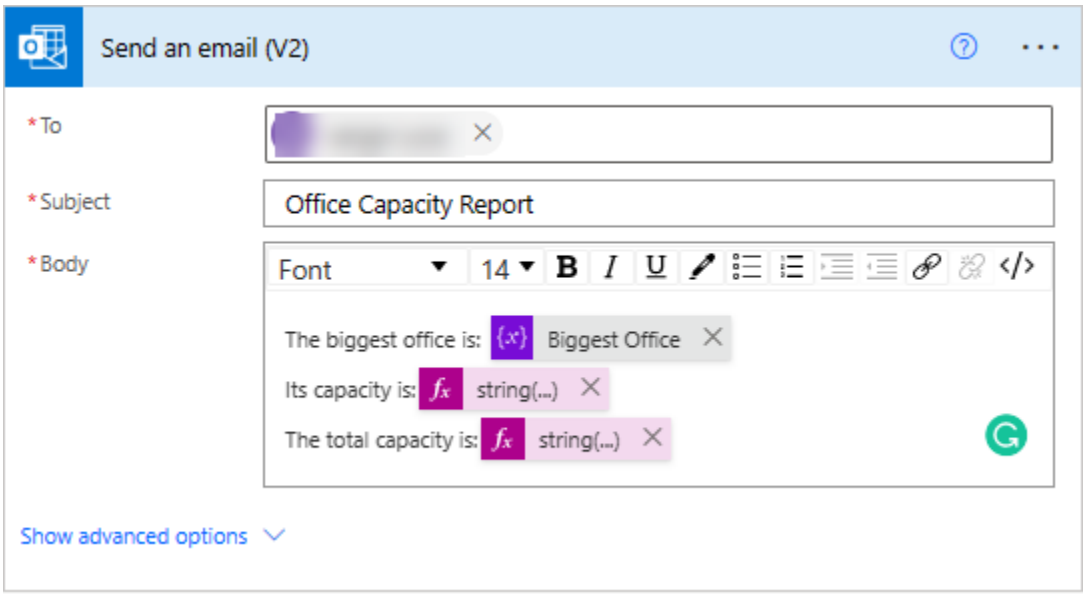
vii. Unfortunately the other variables **Biggest Capacity** and **Total Capacity** are numbers, and the Send an e-mail designer expects strings; you will have to rely on a custom expression: more the cursor next to Its capacity and click Expression, where you can type string



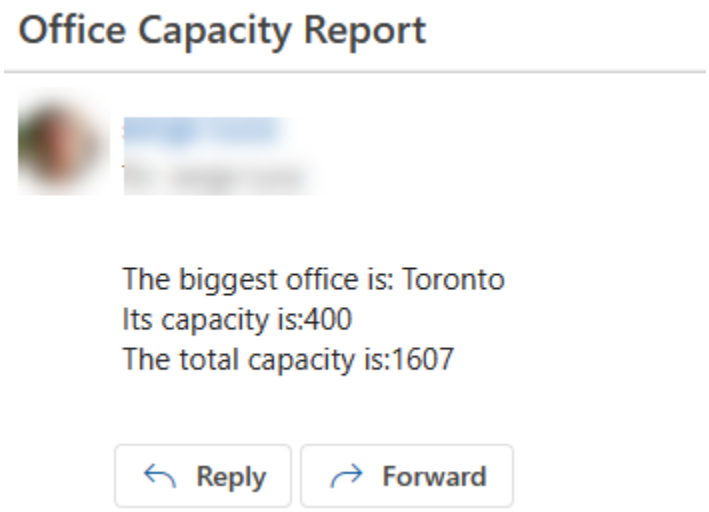
Move the cursor within the string () parentheses and click dynamic value to grab the variable Biggest Capacity (and click more if you don't find it in the list of variables):



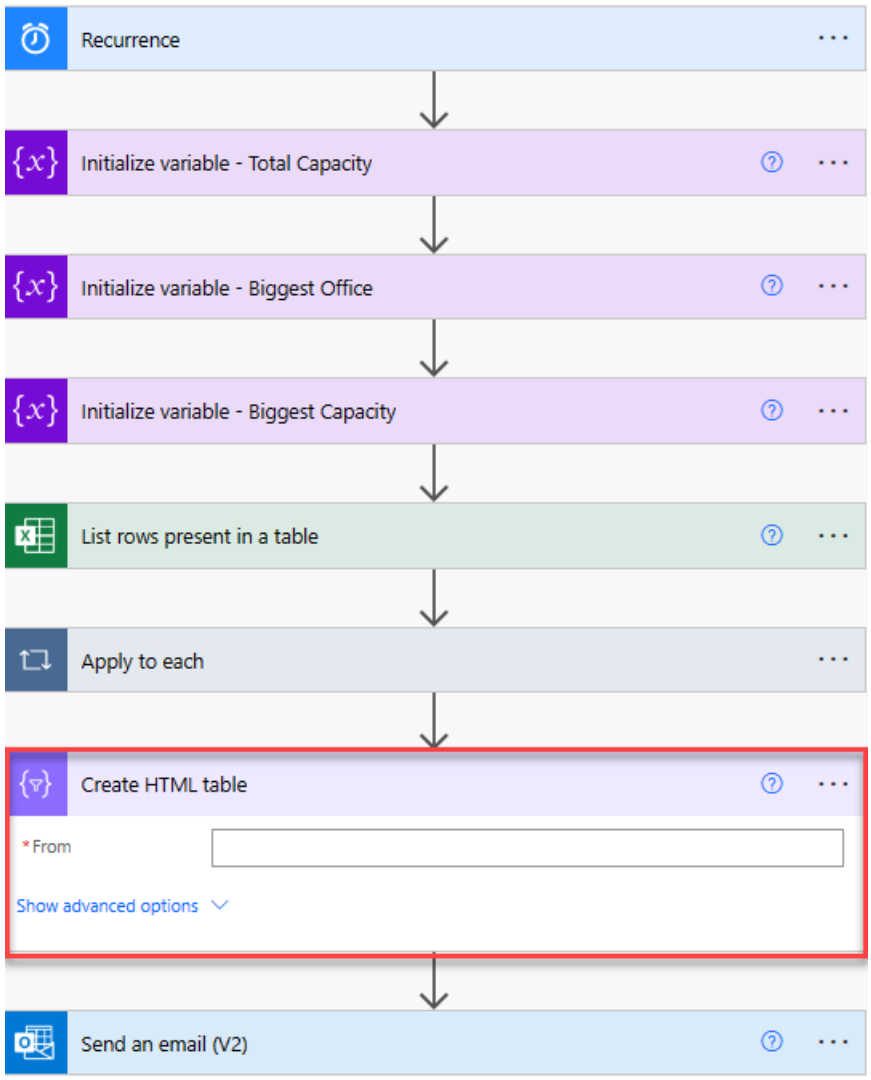
viii. Eventually, the e-mail body should look like this:



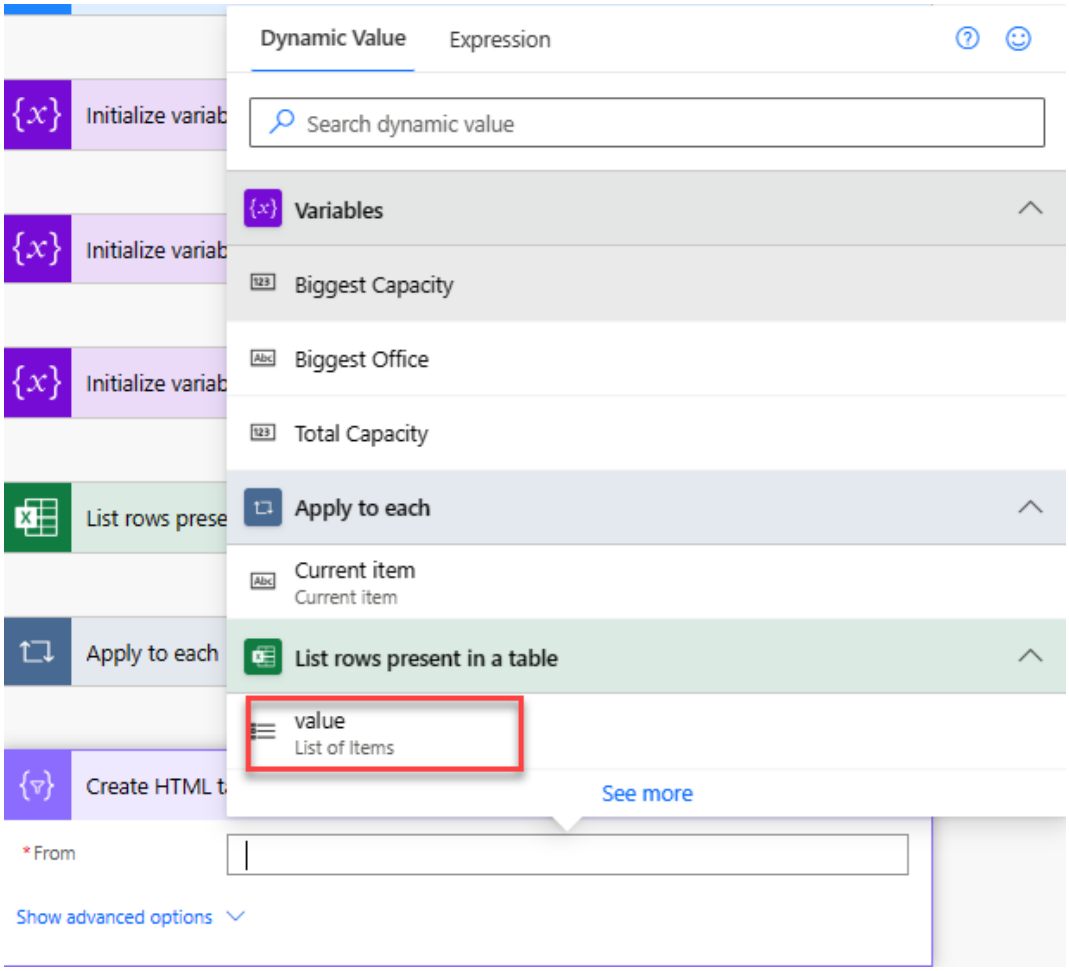
18. Save your flow and test it.
19. Check your e-mail; you should receive something like this:



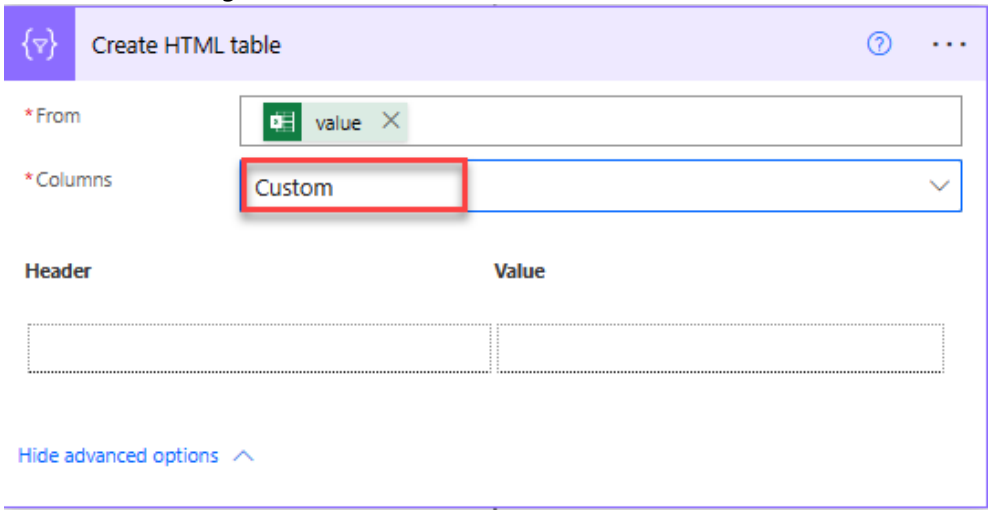
20. In the following steps, we will display the list of offices, so we will have to define a list formatting logic and create an HTML table based on this logic.
21. Let's define the list formatting logic. Before the **Send an e-mail action,** add a **Data Operations – Create HTM table** action:



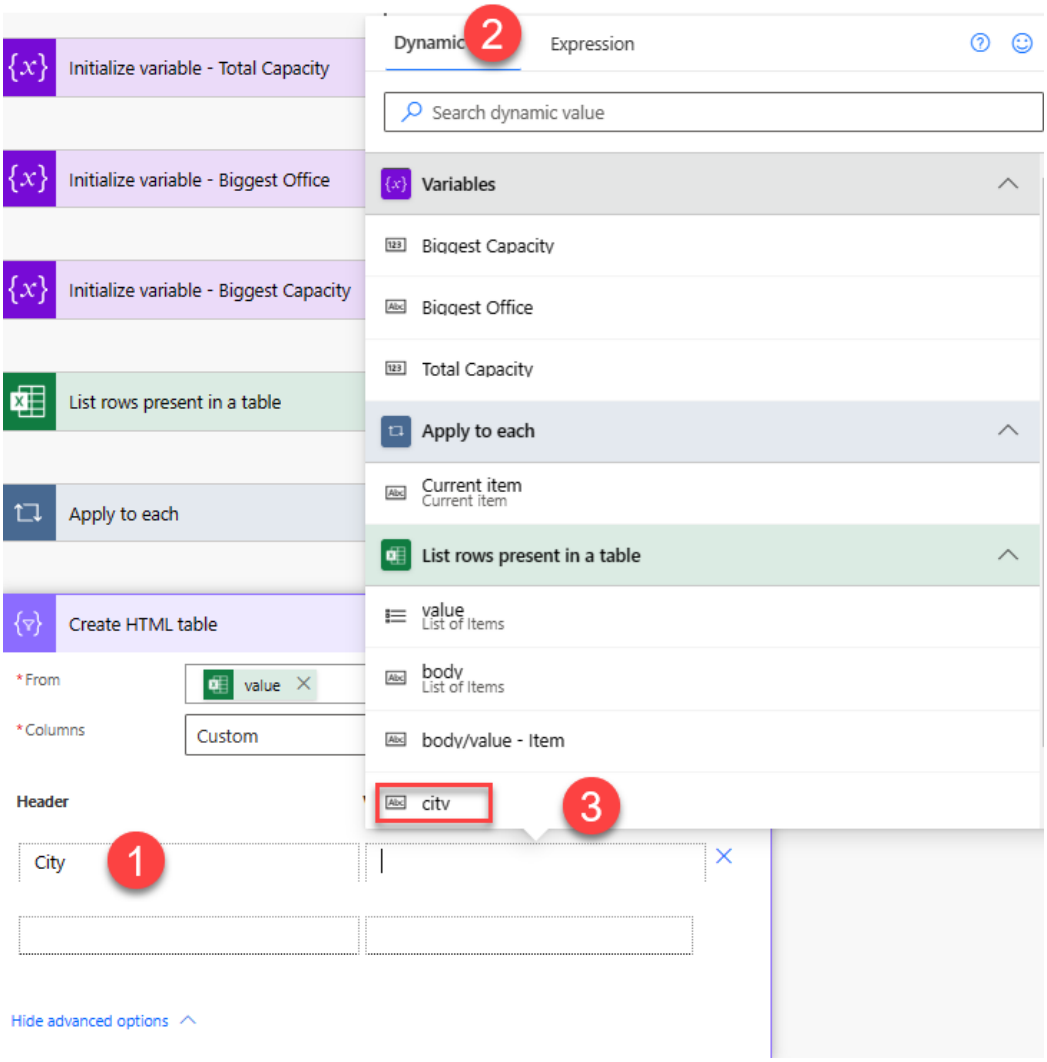
22. Move the cursor in the From field and select the dynamic value associated with **the List rows present in the table** action:



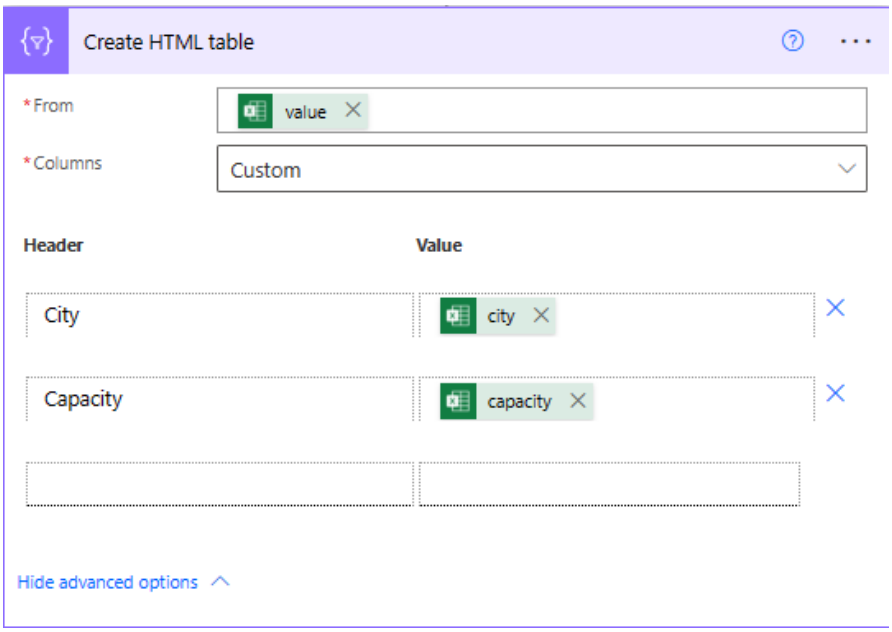
23. Change the columns settings from Automatic to **Custom**:



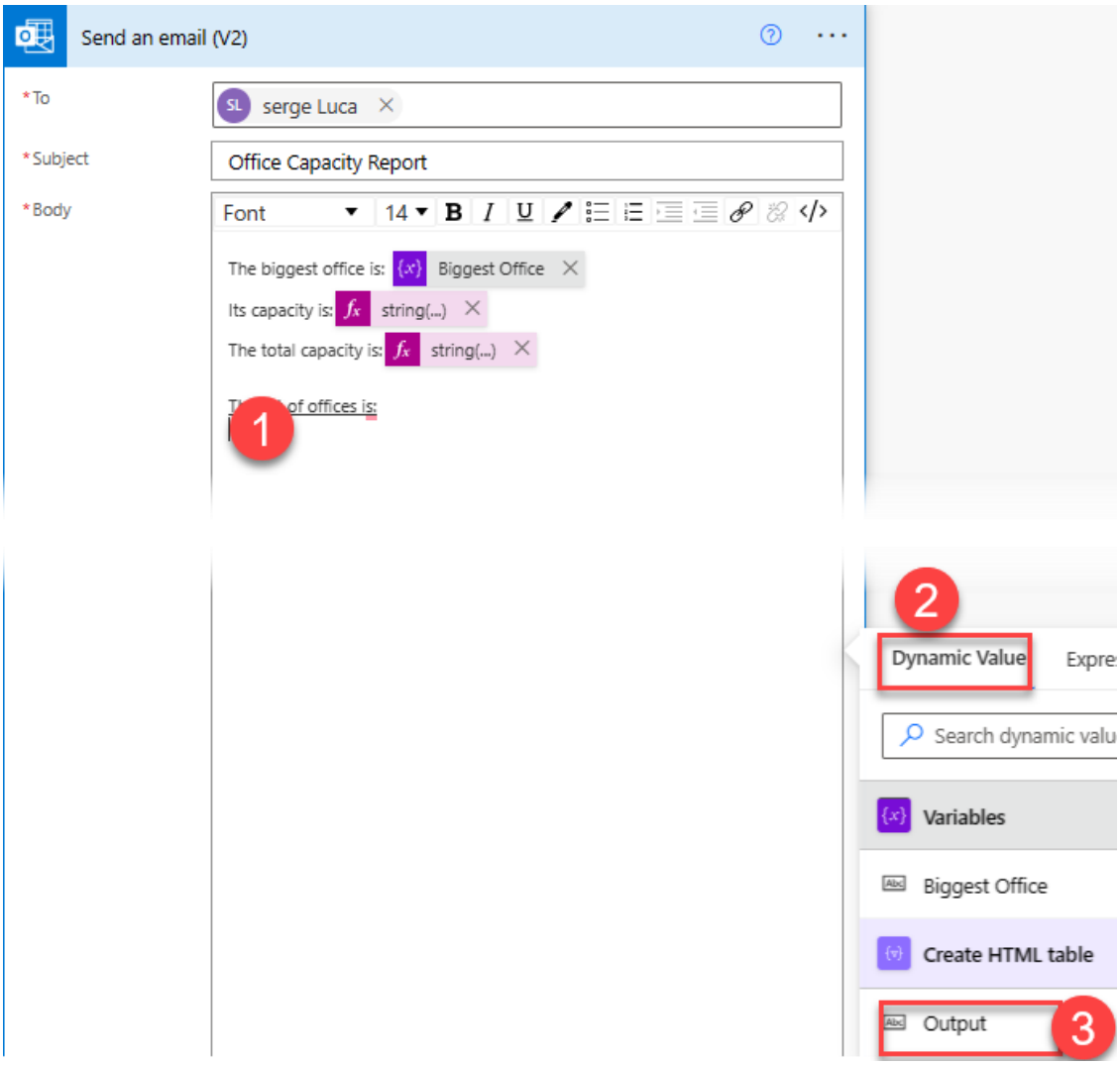
24. You can now define the logic of your report : the header name (in **Header**) and the dynamic value or the expression associated with each header in **Value**.
25. In the **Header** field, type **City**, and in **Value** select **the dynamic value city** :



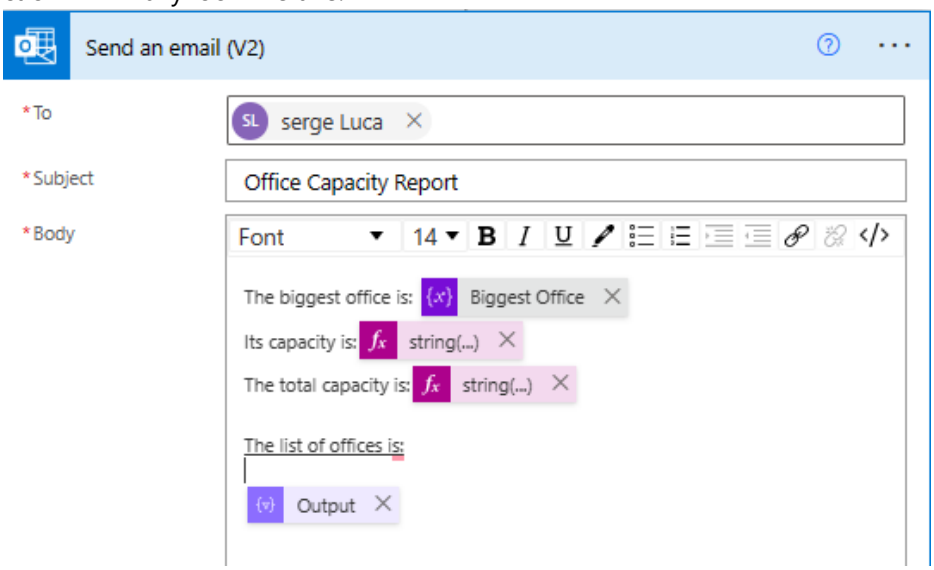
26. Follow the same procedure for Capacity:



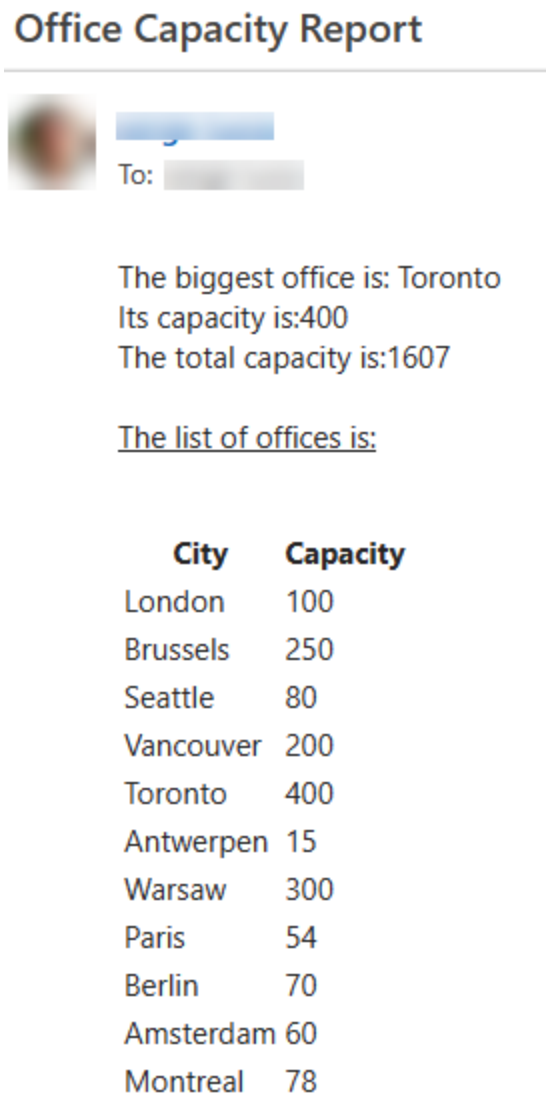
27. Go back to the **Send an e-mail** action and update the **Body** text box to include the Create HTML Output value: just type the Total list of offices is : and add the output of The create HTML table action:



28. The action will finally look like this:



29. Test your flow and check your e-mail:



Office Capacity Report

To:

The biggest office is: Toronto
Its capacity is:400
The total capacity is:1607

The list of offices is:

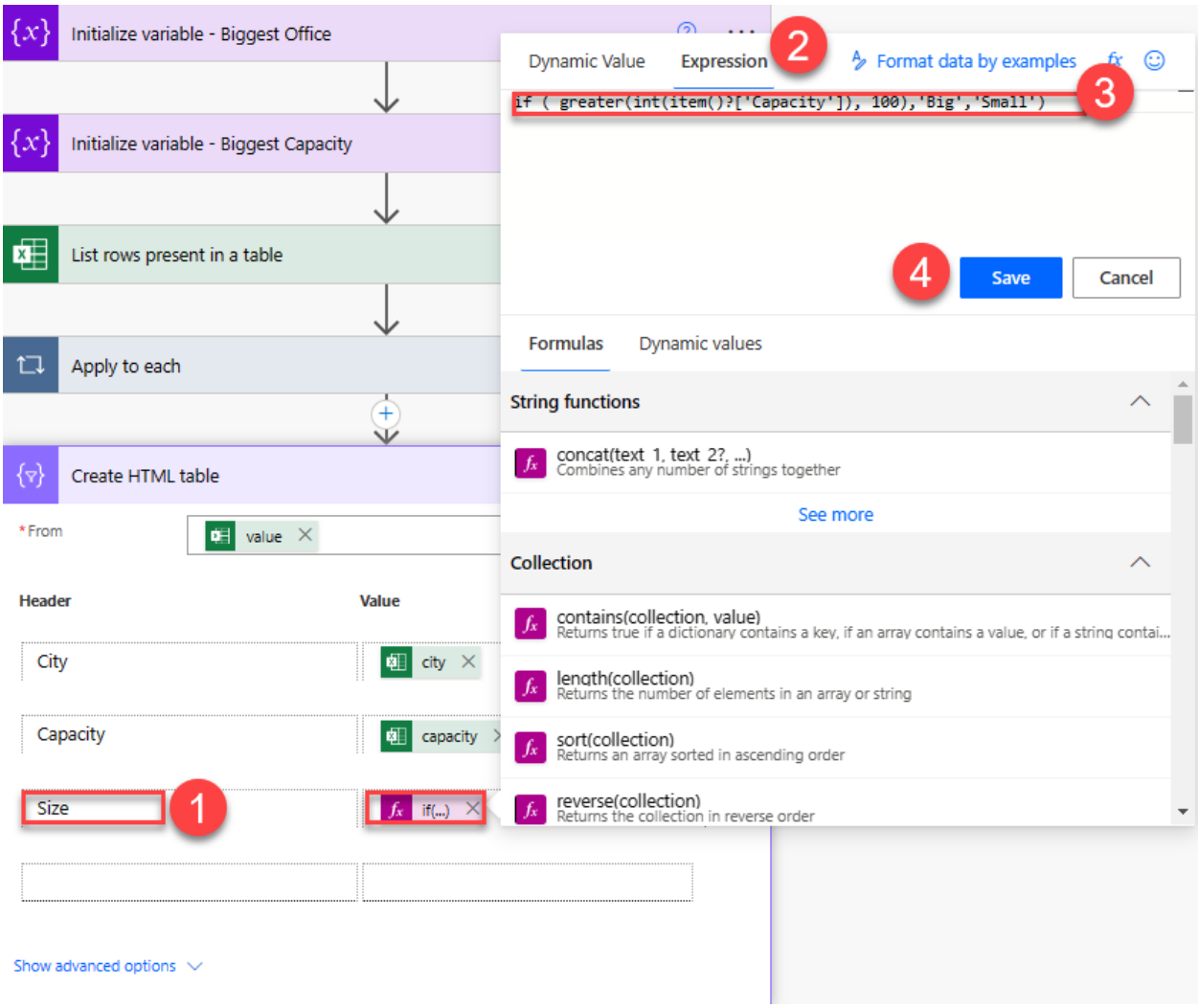
City	Capacity
London	100
Brussels	250
Seattle	80
Vancouver	200
Toronto	400
Antwerpen	15
Warsaw	300
Paris	54
Berlin	70
Amsterdam	60
Montreal	78

The rest of the exercise will be about customizing step by step the returned table, which will eventually look like this :

City	Capacity	Size
London	100	Small
Brussels	250	Big
Seattle	80	Small
Vancouver	200	Big
Toronto	400	Big
Antwerpen	15	Small
Warsaw	300	Big
Paris	54	Small
Berlin	70	Small
Amsterdam	60	Small
Montreal	78	Small

30. Let's extend our flow by adding a new column named Size in our report: the logic is that if the quantity is smaller than 100, we would like to see "Small", otherwise we will see "Big".
    Answer; you willneed to use the folloiwng functions **if()** and **greater().** The expression is **:**

```
if ( greater(int(item()?['Capacity']), 100),'Big','Small')
```



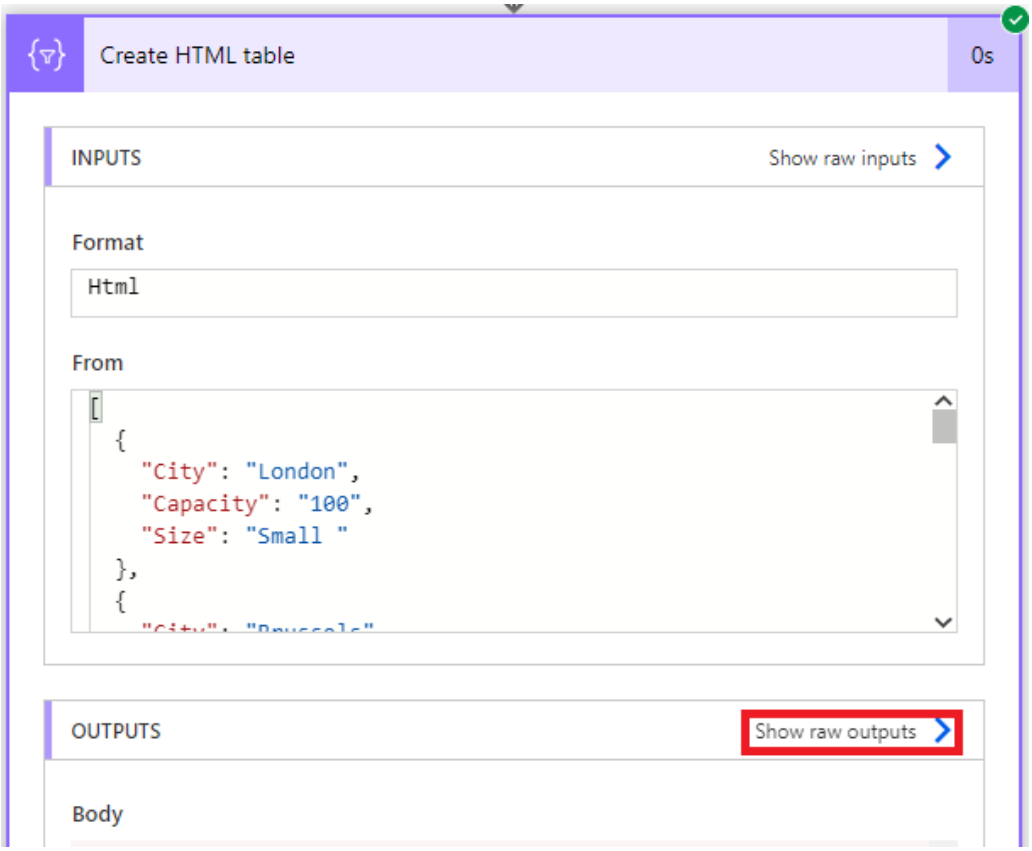
The generated mail will look like this:

The biggest office is: Toronto
Its capacity is:400
The total capacity is:1607

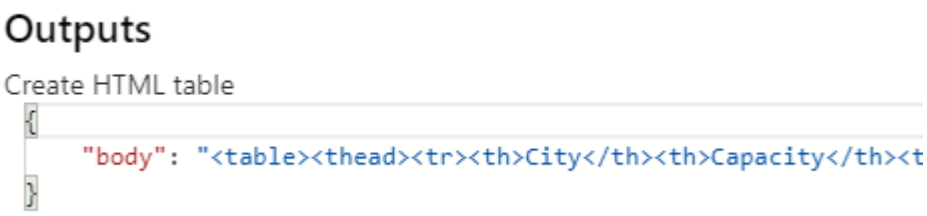
The list of offices is:

City	Capacity	Size
London	100	Small
Brussels	250	Big
Seattle	80	Small
Vancouver	200	Big
Toronto	400	Big
Antwerpen	15	Small
Warsaw	300	Big
Paris	54	Small
Berlin	70	Small
Amsterdam	60	Small
Montreal	78	Small

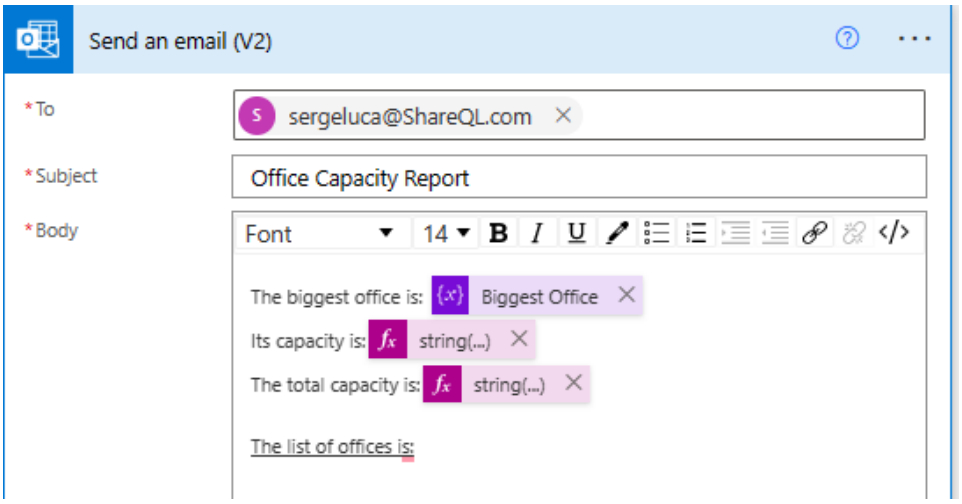
31. Now we would like to customize the generated html code by adding a table border.
    a. First, let analyze the html generated code by clicking on an existing flow run and then click the option "Show raw outputs' of the Create HTML Table action as illustrated below:



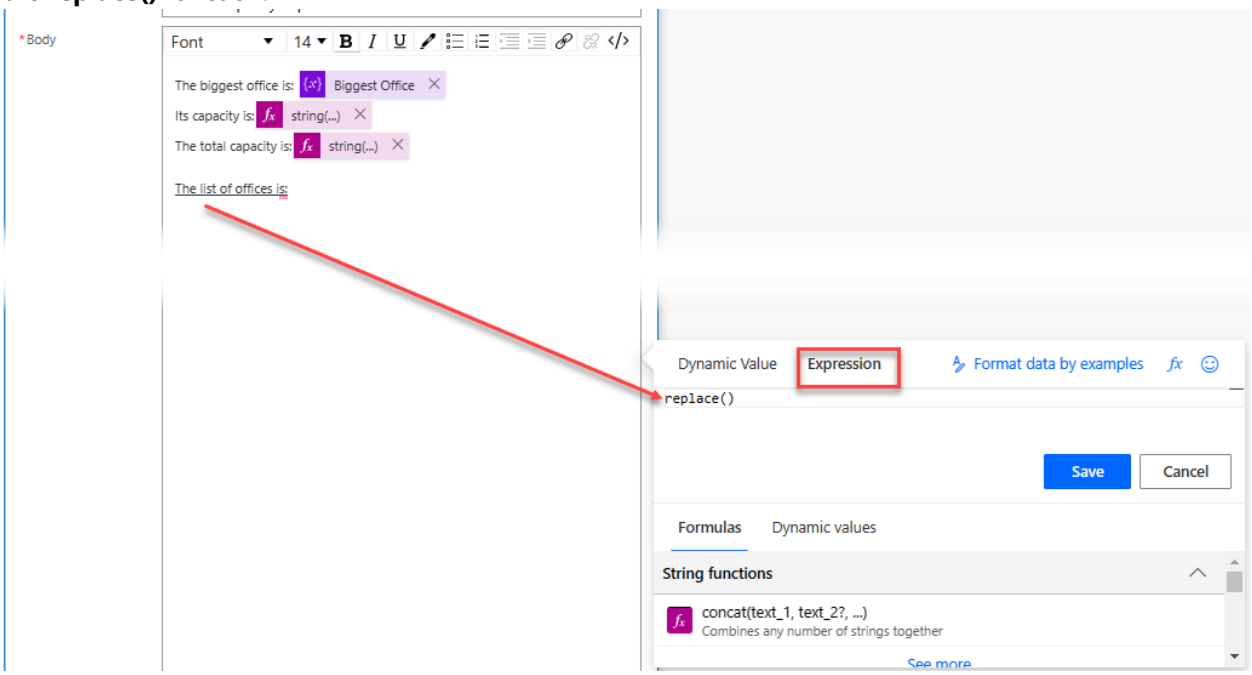
The html code looks like this:



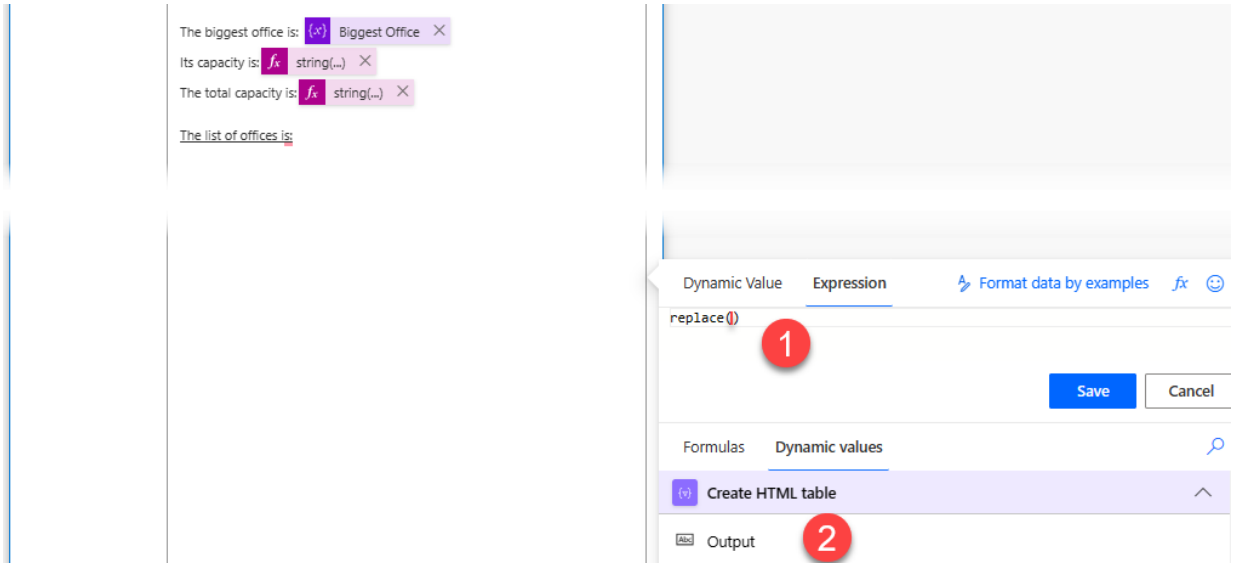
You need to replace **<table>** with **<table border="1">.** You can do it by using the **replace**() function.
In the body of the e-mail, remove the output of the Create Html table action:



Add the cursor where you want to display the html table and click **expression** where you can type the **replace()** function:



Move the cursor in the replace parentheses, and Click **Dynamic Value** (just down below, not the next one), to grab the Create HTML table – Output:



In replace, type **,'<table>','<table border="1">')** , the final code should be **replace(body('Create_HTML_table'),'<table>','<table border="1">'),** and click **Save.**

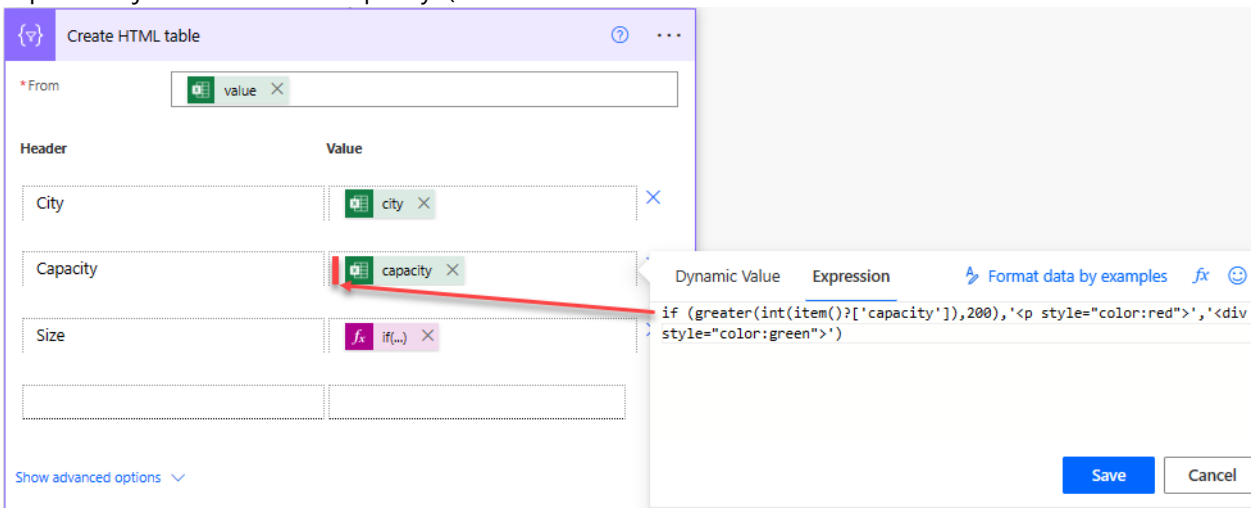
The mail will look like this:

The biggest office is: Toronto
Its capacity is:400
The total capacity is:1607

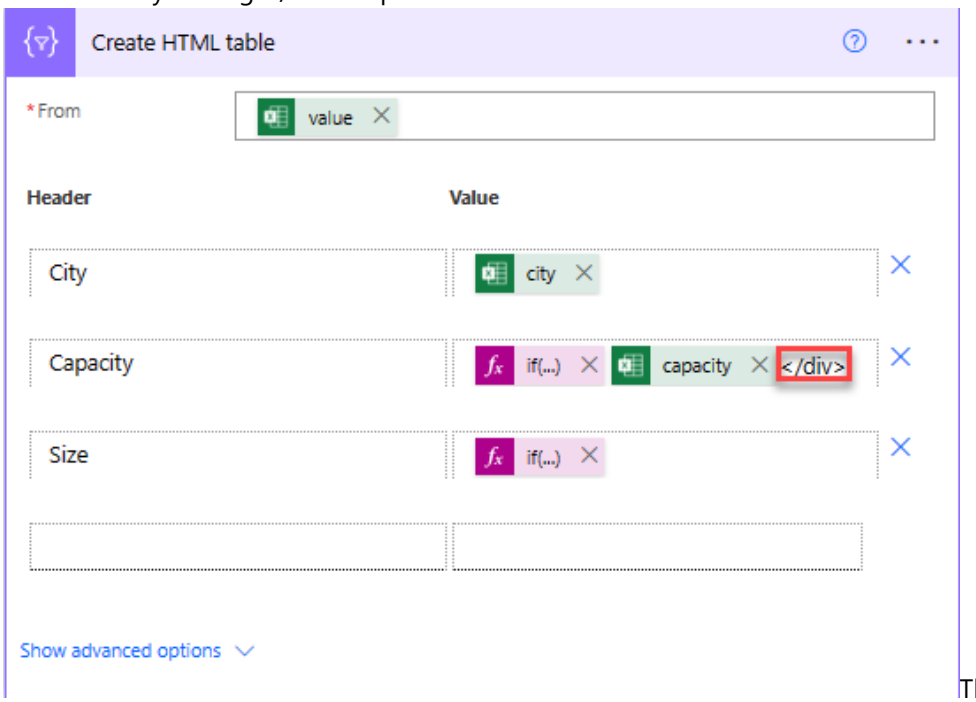
The list of offices is:

City	Capacity	Size
London	100	Small
Brussels	250	Big
Seattle	80	Small
Vancouver	200	Big
Toronto	400	Big
Antwerpen	15	Small
Warsaw	300	Big
Paris	54	Small
Berlin	70	Small
Amsterdam	60	Small
Montreal	78	Small

32. A more advanced exercise is to display the capacity number in red if it is greater than 200, and in green otherwise.
    a. Edit the Create HTML table action, and in the capacity value field, add the following expression just to the left of capacity: (and click **Save**>



b. Close the Div by adding in plain text:



The

c. The generated e-mail will look like this:

The biggest office is: Toronto
Its capacity is:400
The total capacity is:1607

The list of offices is:

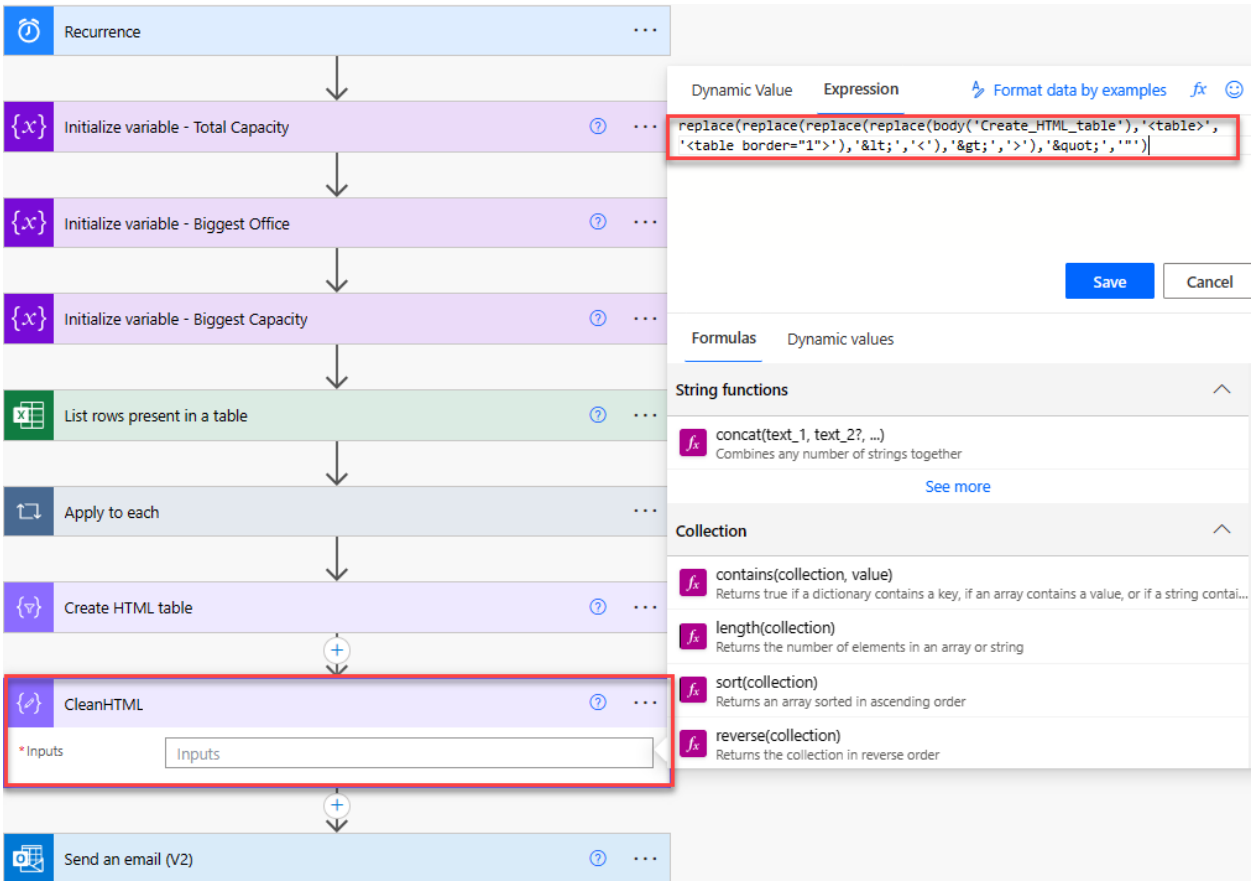
City	Capacity	Size
London	100	Small
Brussels	<p style="color:red">250	Big
Seattle	80	Small
Vancouver	200	Big
Toronto	<p style="color:red">400	Big
Antwerpen	15	Small
Warsaw	<p style="color:red">300	Big
Paris	54	Small
Berlin	70	Small
Amsterdam	60	Small
Montreal	78	Small

Actually the html mbols <,> and ' are automatically replaced with their encoded value as illustrated in the following table

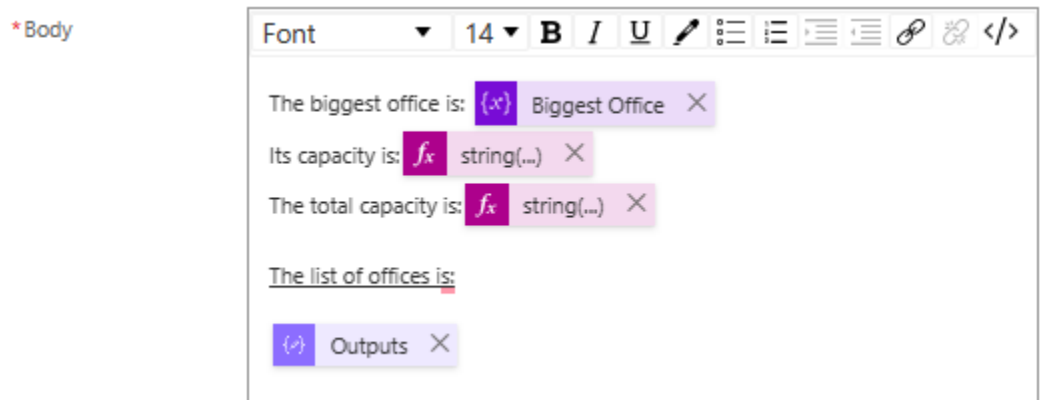
<	<
>	>
'	"

d. After the create HTML Table action, add a **Compose** action (rename it **CleanHTML**) where you can add the following expression:

```
replace(replace(replace(replace(body('Create_HTML_table'),'<table>','<table bor-
der="1">'),'&lt;','<'),'&gt;','>'),'&quot;','"')
```



e. Send the output of CleanHTM into the Send an e-mail action:



f. Test your flow; the received e-mail will look like this:

The biggest office is: Toronto
Its capacity is:400
The total capacity is:1607

The list of offices is:

City	Capacity	Size
London	100	Small
Brussels	250	Big
Seattle	80	Small
Vancouver	200	Big
Toronto	400	Big
Antwerpen	15	Small
Warsaw	300	Big
Paris	54	Small
Berlin	70	Small
Amsterdam	60	Small
Montreal	78	Small

We need your feedback

Do you want to report an issue or suggest something? We need your feedback:
https://github.com/Power-Automate-in-a-day/Training-by-the-community/issues