



## Copy and paste

**Objective:** *This tutorial explains what copy and paste looks like and does.*

### Step 1:



Create a new **Blank Setup** project in IA.

### Step 2:

Select the **MSIcode** window and type in `MessageBox` and press enter. A dialog will be displayed. Change it so that it looks like this:



When you click the **OK** button, IA will insert the following statement into the MSIcode:



The first thing to note is that all you see in the code is the message title and its caption. You don't see any reference to either the icon or the buttons used by the message box. Now position the cursor on the statement and press enter. You will now see the icon and the buttons in the dialog. How does IA do that when you don't see it in the MSIcode? What you see in the statement is an abridged copy of the full statement.

If you want to see what IA has written under-the-hood you need to copy and paste the statement and then load it into an external editor of your choice. This



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calls for caution. If you select the **MSIcode** tab, the ribbon will contain buttons for **Copy**, **Paste**, and **Copy as Text**. The **Copy** button and **Copy as Text** buttons do very different jobs. Select the `MessageBox` statement and click the **Copy** button (Ctrl+C). Now paste the statement into your favourite editor. Here is what the statement looks like in mine:

```
0 10 20 30 40
1 ~InstallAware Clipboard Data~
2 ~MessageBox~
3 ~{7BD05EAF-AD86-4F1D-928E-6355E958449B}~
4 ~Test message~
5 ~This is a test message.~
6 ~0~
7 ~1~
8 ~~~
9
10
11
12
```

The syntax of the statement is very precise and statement components are separated by tilde (~) characters.

Lines 1 and 2 are easy to understand.

Line 3 is the GUID that has been generated for this statement.

Lines 4 and 5 are recognisable as the title and message.

Line 6 is the icon. 0 is used for the information icon.

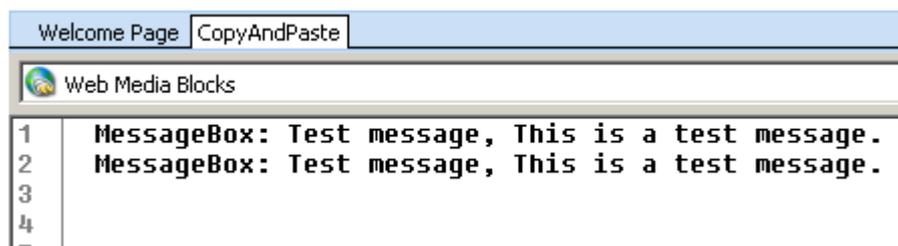
Line 7 is the button. In this example, 1 displays the OK button only.

Change the 0 value in line 6 to 1 (question icon) and the value 1 in line 7 to 2 (OK and Cancel buttons). Now select lines 1 through 8 and copy them all.

Position the cursor on line 2 in the MSIcode and paste in the contents from your editor.

### Step 3:

Save, build and run the project. You'll see the immediate difference in message boxes that are displayed. But if you look in the MSIcode you will see this:



There is no *visible* difference between the statements that are displayed in the window. Only by selecting a statement and pressing enter will you see the under-



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the-hood differences. This is true in IA if and only if you use the conventional copy and paste operation. If you select statements using the **Copy as Text** button then only the *visible* MSIcode statement is copied, not the under-the-hood statement. It might be useful to occasionally copy and paste existing statements and then make the granular changes required. You can't do this using the **Copy as Text** button. This button has limited use in IA but it is useful if you want to copy statements for use in another application, like Word, for example. You cannot use the **Copy as Text** button to copy and paste statements in the MSIcode. Go on, try it. You'll see the paste operation (Ctrl+V) does nothing.

### Step 4:

Select the two MSIcode statements and copy them (Ctrl+C). Mine looks like this:

```
0 10 20 30 40
1 ~InstallAware Clipboard Data~
2 ~MessageBox~
3 ~{028C453D-72C9-4325-BE29-0295C075C856}~
4 ~Test message~
5 ~This is a test message.~
6 ~1~
7 ~2~
8 ~~~~~
9 ~MessageBox~
10 ~{7BD05EAF-AD86-4F1D-928E-6355E958449B}~
11 ~Test message~
12 ~This is a test message.~
13 ~0~
14 ~1~
15 ~~~~
16
17
18
19
```

Lines 9 through 15 are the code for the first message box. If you compare these statements to the previous image you'll see nothing has changed.

Now look at lines 2 through 7. These are the statements for the second message box. When we copied the original statement we did not make any change to the GUID (lines 3 and 10). IA internally changed the GUID and generated a new one for the second message box. As you see, copy and pasting code causes IA to generate new GUIDs for the statement when it needs to. There is nothing wrong changing the generated code but if you do it incorrectly or otherwise break the syntax you will get an error when you paste the code back into your MSIcode.

Does the IA generated code have any value other than as an easy way to let you make edits to newly introduced statements? One environment where it is extremely useful is in the IA forums. Sometimes, you might want to post some code that is causing you difficulty. If you simply copy the statement using the **Copy as Text** button you will not provide enough information for someone to try and *replicate* a problem you are having. Remember, copying statements as text is nothing more than the visible statement in the MSIcode. If you use that text in a forum thread you'll be telling the community what it is you are *trying* to do but you won't be telling anyone *how* you are doing it. In other words, all the hidden





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information is concealed and other forum users can only best guess what you were really trying to do.

### Summary:

Copy and paste is most useful when you want to move sections of your MSIcode from one place to another.

It is useful for replicating statements but editing it in an external editor has limited value. It is far easier to select the statement, press enter, and edit it using the design time dialog.

Copying as text is useful if you want to copy the visible MSIcode statements into another application where the text of the statement is useful but not the internals of the statement.

If you post statements to the community forums consider copying the full statement. Only use **Copy as Text** if you want to discuss contextual points of IA law.

Copying the full statement lets another forum user replicate your *exact* statement and logic.

It helps you to understand and get an insight into the code that IA generates for you. To be sure, the syntax is not as useful as the design time dialog but an exact copy of the code tells an exact story. Sometimes, a thousand words is better than a picture.

