
Subject: Re: copying of objects

Posted by [David Fanning](#) on Tue, 08 Oct 2002 12:40:52 GMT

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Sebastian Loebbert (sebaaih@peach.zrz.TU-Berlin.DE) writes:

```
> how can I copy an object?
> E.g.:
> v0 = OBJ_NEW('IDLgrVolume')
> v1 = v0
>
> v1 only contains only a reference to v1, so I cannot use v0 and v1 in
> different model trees, which is what I need.
> I was looking for something like
> v1 = OBJ_NEW( v0 ), but this doesn't work.
```

Copying objects is one of those things that come up over and over again in object programming. In practice it seems difficult, because you have the problem of "deep" copying (i.e., pointers to pointers, other objects with pointers, etc.) You start thinking about recursion, then--of course--you get totally confused.

You have a page full of diagrams with arrows going every which way, your migraine headache starts up again, and you begin to think, "Oh, hell, I'll just go back to thinking about where to invest my money in the stock market." It seems so much easier.

Even if you call up RSI and ask the experts there, they give you the same old song and dance, and you work on it some more until your eyes cross and your backhand has disappeared from disuse.

But it still never works right...until you discover the secret. :-)

Here it is (already published in this newsgroup space, I guess, although I must have missed it, and never with as much unnecessary build-up as I'm going to give it). RSI has already done the work for you!!

Seriously. The secret is SAVE and RESTORE. Here is the secret to copying an object:

```
newobject = oldobject
Save, newobject, Filename='secret.sav'
Restore, 'secret.sav'
```

Done. Do you believe it? I know I didn't. But it works like a charm.

Here is a function, then, to copy objects:

```
.*****  
;  
;* A function to copy objects *  
.*****  
;
```

```
FUNCTION OBJ_COPY, obj, TEMPDIRECTORY=temp
```

```
    CATCH, error  
    IF (error NE 0) THEN $  
    BEGIN  
        CATCH, /CANCEL  
        RETURN, OBJ_NEW ()  
    ENDIF
```

```
    IF (NOT OBJ_VALID (obj)) THEN MESSAGE, 'Invalid object reference.'
```

```
    CD, CURRENT=origDir  
    IF (N_ELEMENTS (temp) NE 0) THEN CD, temp
```

```
    newobj = obj  
    SAVE, newobj, FILENAME='temp.sav'  
    RESTORE, 'temp.sav'  
    FILE_DELETE, 'temp.sav'  
    IF (N_ELEMENTS (temp) GT 0) THEN CD, origDir
```

```
    RETURN, newobj
```

```
END
```

Cheers,

David

--

David W. Fanning, Ph.D.
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Subject: Re: copying of objects

Posted by [Struan Gray](#) on Tue, 08 Oct 2002 14:39:12 GMT

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David Fanning, david@dfanning.com writes:

>

> Sebastian Loebbert (sebaaihb@peach.zrz.TU-Berlin.DE) writes:

>

>> thanks a lot, so it was not only me not finding the right

>> function but RSI not providing one.

>> That save-and-restore works fine, but I suppose I better

>> shouldn't use it too often, it doesn't look that performant...

>

> I don't know about "performant". When its the only

> alternative, I'd say it looks pretty darn good.

I've been playing around with saving objects recently and have discovered some gotchas.

Performance is one. A 10 Mb dataset of mostly integer type that takes under a second to read in from the raw binary file takes over thirty second to save and about the same again to read in. Much faster to write a copy method.

Also, if you seperate the saving and restoring into different procedures you can run into some problems with namespace contamination. I konw JD Smith and C. Markwardt have addressed this in their routines.

One extra tidbit that hit me hard until I figured out what was going on was that if you save multiple objects in the same file and restore later, the order that they appear in the RESTORED_OBJECTS array has nothing to do with their hierarchy but is the order in which they were oringinally created. If you use containers a lot, this can throw you out of sync badly, particularly if the container is created after the containees. Then, you have to do some digging to find out which of the restored objects contains the others.

I don't want to say any more because this knowledge is the only way I can compensate for my appalling hand-eye coordination and lack of tennis ability at the up-coming meeting of the European Section of the Advanced Programmers' Guild.

Struan

Subject: Re: copying of objects

Posted by [David Fanning](#) on Tue, 08 Oct 2002 15:10:00 GMT

Struan Gray (struan.gray@sljus.lu.se) writes:

- > I don't want to say any more because this knowledge is the only way
- > I can compensate for my appalling hand-eye coordination and lack of
- > tennis ability at the up-coming meeting of the European Section of the
- > Advanced Programmers' Guild.

I've heard that we can't get enough people together to fill out the tennis draw. The wusses all want to play golf, if you can imagine that!

Cheers,

David

P.S. Let's just say I'd rather get thumped by the young bucks playing tennis than lose to my father playing golf. :-(

--

David W. Fanning, Ph.D.
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Subject: Re: copying of objects
Posted by [Struan Gray](#) on Tue, 08 Oct 2002 15:24:49 GMT
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David Fanning, david@dfanning.com writes:

- > I've heard that we can't get enough people together
- > to fill out the tennis draw.

Yippeeee! Ahem, <serious_face> Oh Dear What A Shame </serious_face>.

- > The wusses all want to play golf, if you can
- > imagine that!

No worries. After last time (Bridge?, bridge!!!?) I'm bringing the cattle prod. The Celine Dion fans who re-programmed the pub jukebox have had their invites routed via Mongolia too. See you there.

Struan

Subject: Re: copying of objects

Posted by [JD Smith](#) on Wed, 09 Oct 2002 21:25:47 GMT

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On Tue, 08 Oct 2002 05:40:52 -0700, David Fanning wrote:

> Sebastian Loebbert (sebaaihb@peach.zrz.TU-Berlin.DE) writes:

>

>> how can I copy an object?

>> E.g.:

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>> v1 only contains only a reference to v1, so I cannot use v0 and v1 in

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>> v1 = OBJ_NEW(v0), but this doesn't work.

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> cross and your backhand has disappeared from disuse.

>

> But it still never works right...until you discover the secret. :-)

>

> Here it is (already published in this newsgroup space, I guess, although

> I must have missed it...

Hi David,

Since one of your own pages

(http://www.dfanning.com/tips/saved_objects.html) documents one

potential peril encountered when using this very technique, I'm quite surprised you weren't aware of it! Come to think of it, I don't spend too much time reading my own web pages either;).

Here's the first reference I can find to it, about 4 years ago (ok, it was me).

<http://groups.google.com/groups?selm=36152C3D.3C8A3C73%40astrosun.tn.cornell.edu>

In any case, some advice for using this save/restore idea for copying, saving, and reverting objects:

- For quick copying in a single IDL session, there's no need to worry about the method-restoration stuff. If, however, you are restoring a saved copy of an object into a new IDL session, you must deal with the fact that the method definitions might be missed, and the class structure might be incorrect (read the copious posts and David's page on the issue).
- Remember that whatever variable you used to save the object is overwritten upon restore. You can also get the objects with judicious use of the RESTORED_OBJECTS keyword.
- Often, you don't want to copy certain data for which the operation isn't relevant, e.g. temporary widget ID's, etc. You can "detach" these before copying, and "reattach" them to the original by using null pointers (or objects). See my many posts on this method.
- The "self" variable can be overwritten! Hard to believe, but true. This is simultaneously dangerous and useful. Use it to easily restore a saved version of an object right on top of itself (e.g. "Revert to saved version..."), within one of the object's methods. Do not forget to free the discarded version. Search on "transmogrification" (a nomenclature for which I received not a small amount of flack) for more on this possibility.

JD

Subject: Re: copying of objects

Posted by [Paul Sorenson](#) on Thu, 10 Oct 2002 02:28:05 GMT

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"Sebastian Loebbert" <sebaaih@peach.zrz.TU-Berlin.DE> wrote in message news:Pine.LNX.4.44.0210081123550.3395-100000@peach.zrz.TU-Berlin.DE...

> Hi all,

>

> how can I copy an object?

[...]
> different model trees, which is what I need.
[...]
> Any ideas?

Yes. Use the ALIAS keyword when adding to your models. You don't need to do the save-and-restore trick!

-Paul Sorenson

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Subject: Re: copying of objects
Posted by [David Fanning](#) on Thu, 10 Oct 2002 02:40:14 GMT
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JD Smith (jdsmith@as.arizona.edu) writes:

> Since one of your own pages
> (http://www.dfanning.com/tips/saved_objects.html) documents one
> potential peril encountered when using this very technique, I'm quite
> surprised you weren't aware of it! Come to think of it, I don't spend
> to much time reading my own web pages either;).
>
> Here's the first reference I can find to it, about 4 years ago

Four years ago!? Goodness, I'm happy if I can remember what I had for dinner last night. :-(

I looked up that article. I wrote it in 1999 (when I was first getting serious about writing an object book). I think I ought to go through all my pages and eliminate anything before 2001 as old hat. (Well, except DEVICE, DECOMPOSED=0, which is timeless.)

Cheers,

David

P.S. Let's just say some people think I write these pages for them. I don't. I write them for me. But I never dreamed I'd actually have to read them after I wrote them. :-(

--

David W. Fanning, Ph.D.

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