Bethesda Tutorial Basic Quest Scripting

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Contents

Overview

This tutorial will show how to use scripting to advance the questline based on player actions. We previously showed how to script dialogue, but this will show how to attach arbitrary scripts to actors and game objects as well.

The reader will learn:

- The basic framework of how scripts work and attach to objects in the Creation Engine
- How to respond to events in the new scripting language

(For an even simpler introduction to scripting, see the "Hello, World" tutorial.)

Papyrus

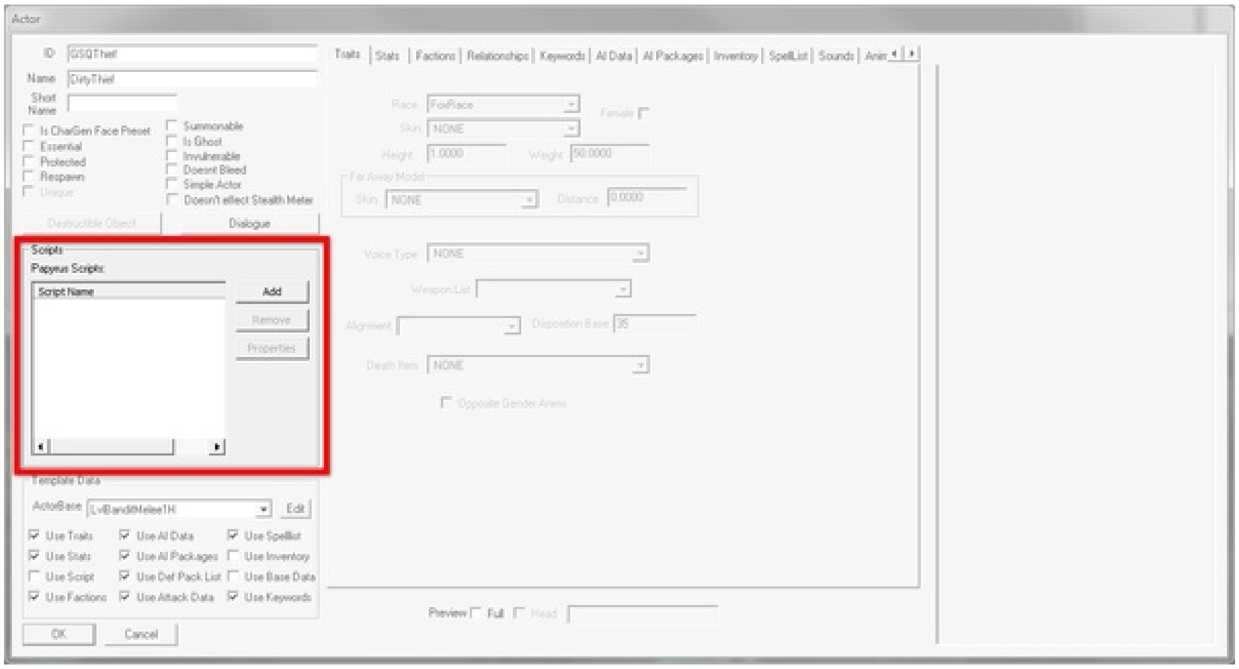
The scripting language used by the Creation Kit is called Papyrus (after the material on which scrolls are printed). Papyrus scripts are normal text files that get turned into a bytecode that the game executes at runtime.

The new system is similar to the old TESScript, but requires a slightly different way of thinking. You can no longer directly manipulate objects in the world; it's now threaded so your script might be interrupted mid-run; it's more of a stickler for things like parentheses. In short, it's much more similar to "real" programming languages like Lua or Python. If you're familiar with TESScript, you'll want to look at our transition guide.

The first thing we're going to do is add a script to the thief so that when it's killed, the quest updates appropriately.

Adding Scripts

Open up the GSQThief actor that we've been creating so far. We'll be looking at the "Papyrus Scripts" section of the window.


Actor
Traits | Stats | Factions | Relationships | Keywords | AI Data | AI Packages | Inventory | SpellList | Sounds | Anim
Destructible Object
Dialogue
Add
Remove
Properties
Edit
OK
Cancel

ID: GSQThief
Name: DirtyThief
Short Name:

- [ ] Is CharGen Face Preset
- [ ] Essential
- [ ] Protected
- [ ] Respawn
- [ ] Unique
- [ ] Summonable
- [ ] Is Ghost
- [ ] Invulnerable
- [ ] Doesnt Bleed
- [ ] Simple Actor
- [ ] Doesn't effect Stealth Meter

Scripts
Papyrus Scripts:
Script Name

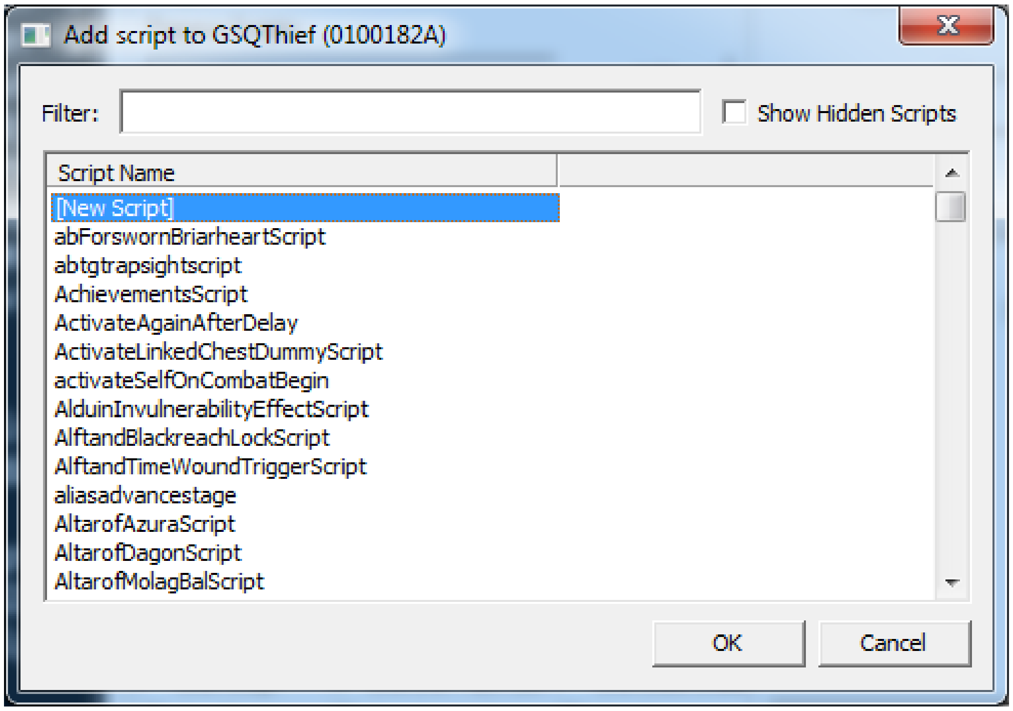
Template Data
ActorBase: LvlBanditMelee1H

✓ Use Traits	✓ Use AI Data	✓ Use Spelllist
✓ Use Stats	✓ Use AI Packages	Use Inventory
Use Script	✓ Use Def Pack List	Use Base Data
✓ Use Factions	✓ Use Attack Data	✓ Use Keywords

Race: FoxRace
Female: [ ]
Skin: NONE
Height: 1.0000
Weight: 50.0000
Far Away Model
Skin: NONE
Distance: 0.0000
Voice Type: NONE
Weapon List:
Alignment:
Disposition Base: 35
Death Item: NONE
- [ ] Opposite Gender Anims

Preview [ ] Full [ ] Head

Click the "Add" button. This brings up a list of scripts we could potentially add to this actor. We're making a new one, though, so double-click on "[New Script]" at the top of the list.

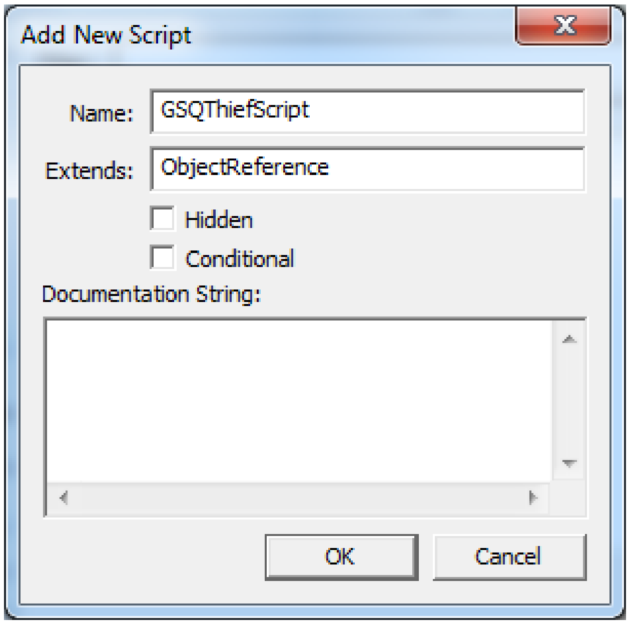


Filter:
- [ ] Show Hidden Scripts

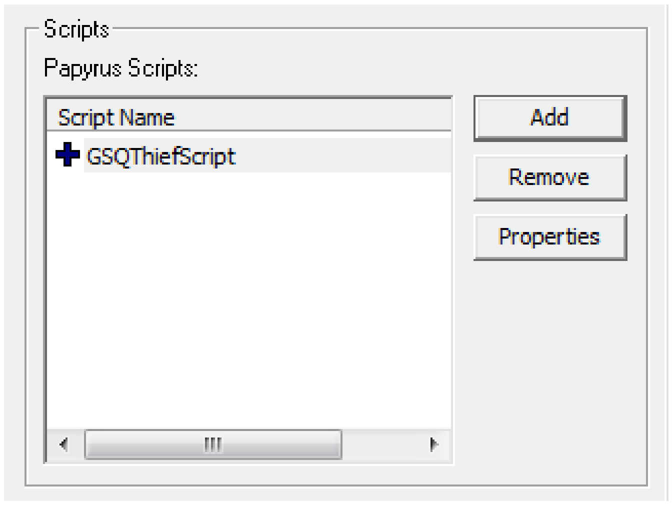
Script Name
[New Script]
abForswornBriarheartScript
abtgtrapsightscript
AchievementsScript
ActivateAgainAfterDelay
ActivateLinkedChestDummyScript
activateSelfOnCombatBegin
AlduinInvulnerabilityEffectScript
AlftandBlackreachLockScript
AlftandTimeWoundTriggerScript
aliasadvancestage
AltarofAzuraScript
AltarofDagonScript
AltarofMolagBalScript

This will pop up yet another window, where you can name your script. Set its name to be "GSQThiefScript" and hit OK.

Now your script is added to the actor. But, as you might expect, it's not actually doing anything just yet.



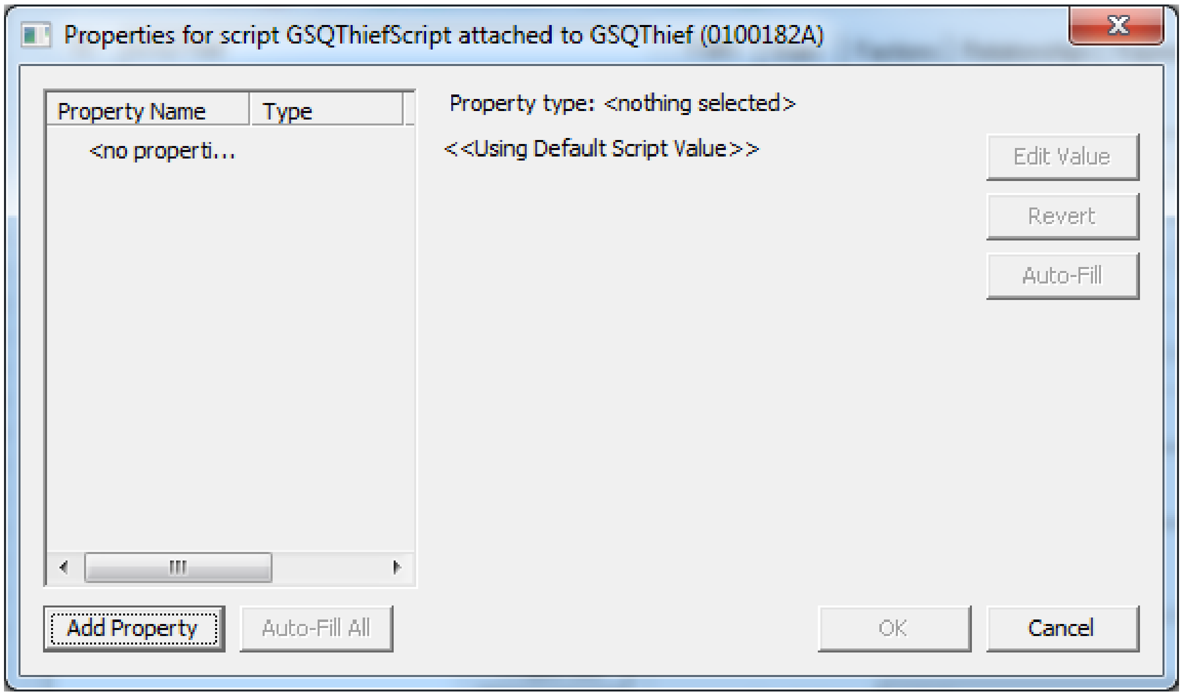
Name: GSQThiefScript
Extends: ObjectReference
Hidden [ ]
Conditional [ ]
Documentation String:



GSQThiefScript

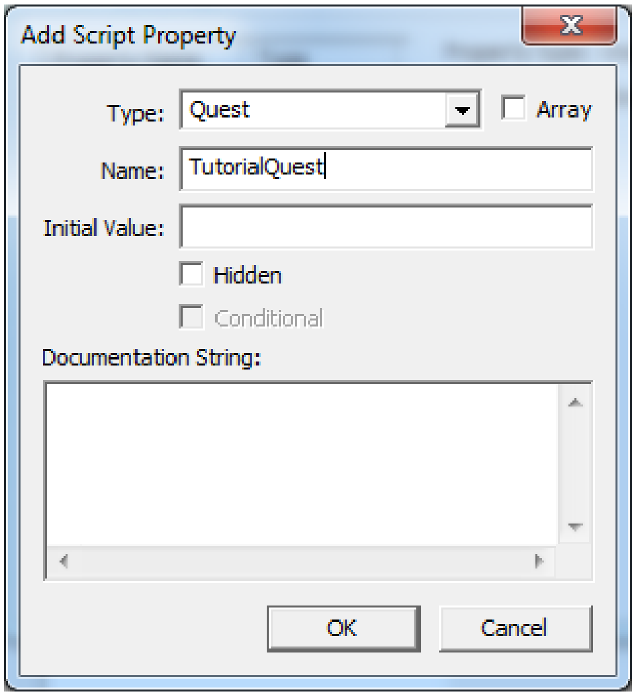
Properties

Double-click on the script name to bring up the Properties Window for this script. On their own, scripts don't know about any objects in the game other than the one to which they're attached. We use properties to hook objects together so they can affect each other. In our example, we want to set GSQ01 to stage 20 when the thief is killed, so we need to tell the script which quest we care about.


Properties for script GSQThiefScript attached to GSQThief (0100182A)
Property Name
Type
<no properti...
Property type: <nothing selected>
<<Using Default Script Value>>
Edit Value
Revert
Auto-Fill
Add Property
Auto-Fill All
OK
Cancel

Press the "Add Property" button at the bottom left of this window. This is where we create the property. In the Type field, either choose "Quest" from the pulldown, or type in the word "Quest". Put "TutorialQuest" in the Name field, and leave everything else blank.

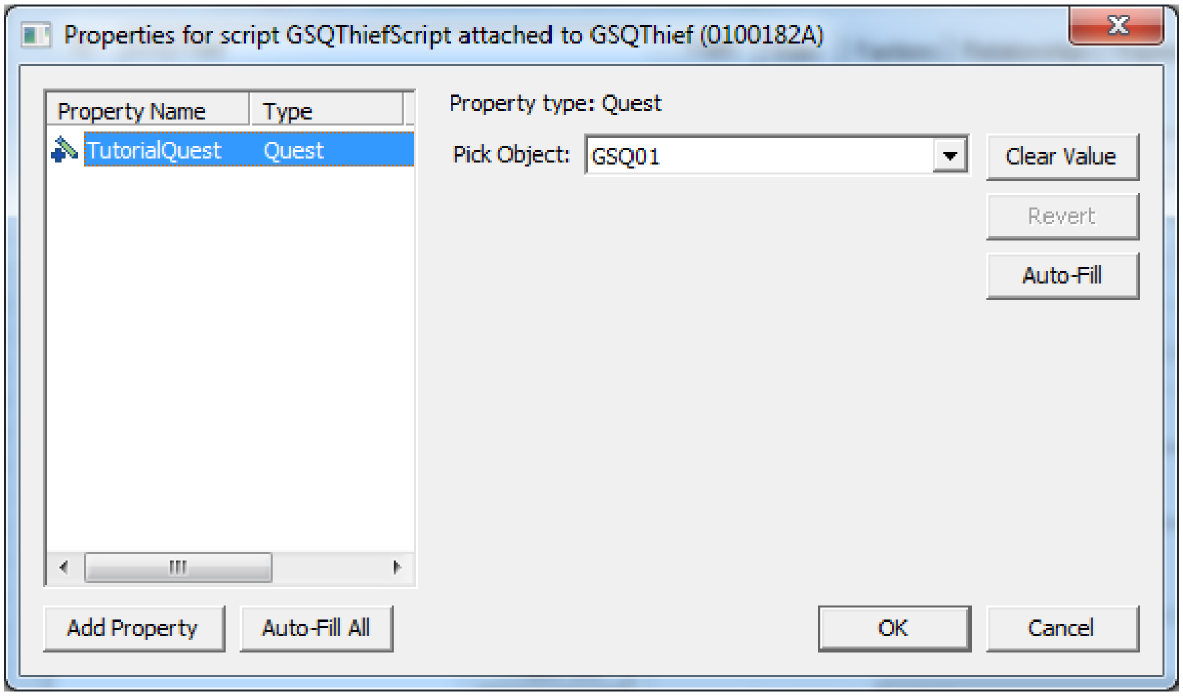
We've now told the script that it should care about something called "TutorialQuest," but it doesn't know which quest that is. Click on the property we just made in the list, and click "Edit Value" on the right side of the window. A new pulldown menu will appear, listing all the quests in the game. Choose "GSQ01" from this menu, and hit OK.



Type: Quest

Name: TutorialQuest

Initial Value:

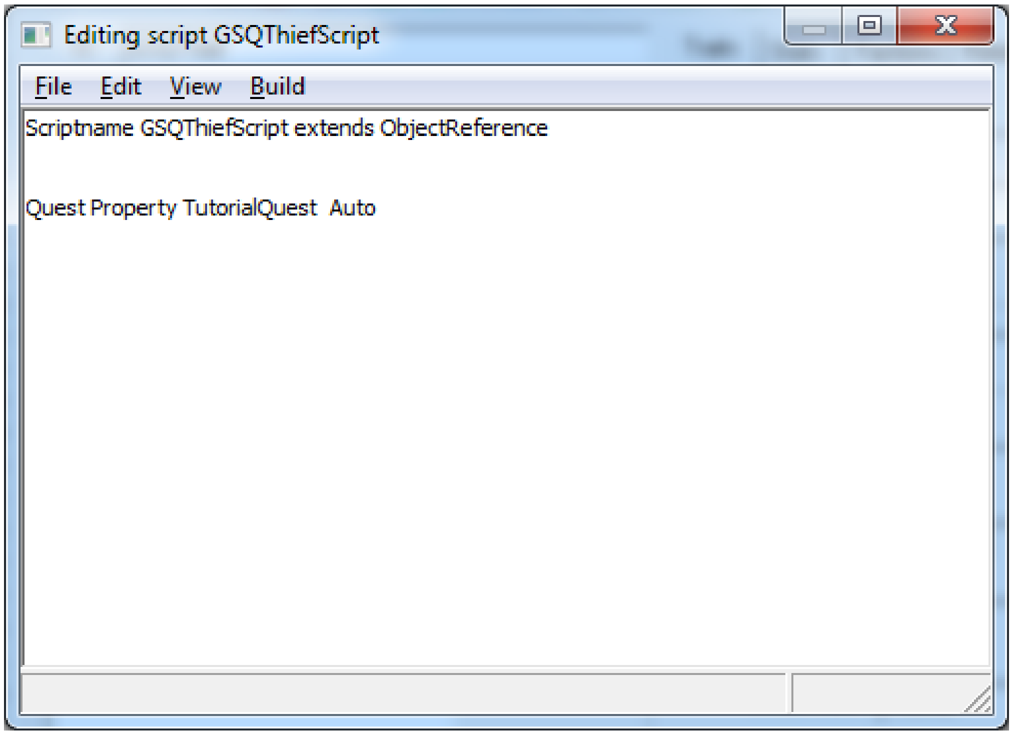


Property Name	Type
TutorialQuest	Quest

Pick Object: GSQ01

Writing the Script

Now that we've added this property, we should add some actual script to do something with it! Right-click on the script name and select "Edit Source" to bring up the script editor.



```
Scriptname GSQThiefScript extends ObjectReference


Quest Property TutorialQuest  Auto
```

The top line (`Scriptname GSQThiefScript extends ObjectReference`) is boilerplate that the editor made for us when we created the script. A few lines below that is the textual version of the property we made.

At the bottom of the text, copy and paste the following snippet of code.

```
Event OnDeath(Actor killer)
        TutorialQuest.SetObjectiveDisplayed(20)
```

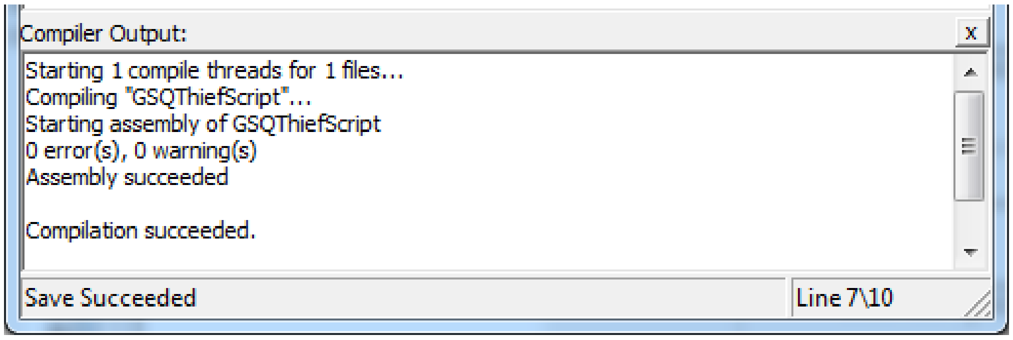
```
 TutorialQuest.SetStage(20)
EndEvent
```

Once again, ignore the `SetObjectiveDisplayed(20)`

If you're familiar enough with programming or scripting that what you just pasted made sense to you, feel free to skip ahead to the "Scripting the Amulet" section. For everyone else, we'll go through line by line.

- `Event OnDeath(Actor killer)`
  - This line declares that the script will respond to the actor dying. When the actor dies, the game will start executing the code from this point. The game will put whoever killed the actor into the "killer" variable, but that part doesn't matter to us.
- `TutorialQuest.SetStage(20)`
  - Just like when we called `SetStage` on the owning quest in the dialogue tutorial, this will set stage 20 on the quest that we set with the TutorialQuest property.
  - We indent it for readability.
- `EndEvent`
  - This signifies the end of our handling of the death event.

Select "Save" from the file menu (or press Ctrl-S) and the editor will attempt to compile your script. An output window will pop up -- if your script is syntactically correct, it will look like this:



```
Starting 1 compile threads for 1 files...
Compiling "GSQThiefScript"...
Starting assembly of GSQThiefScript
0 error(s), 0 warning(s)
Assembly succeeded

Compilation succeeded.
```

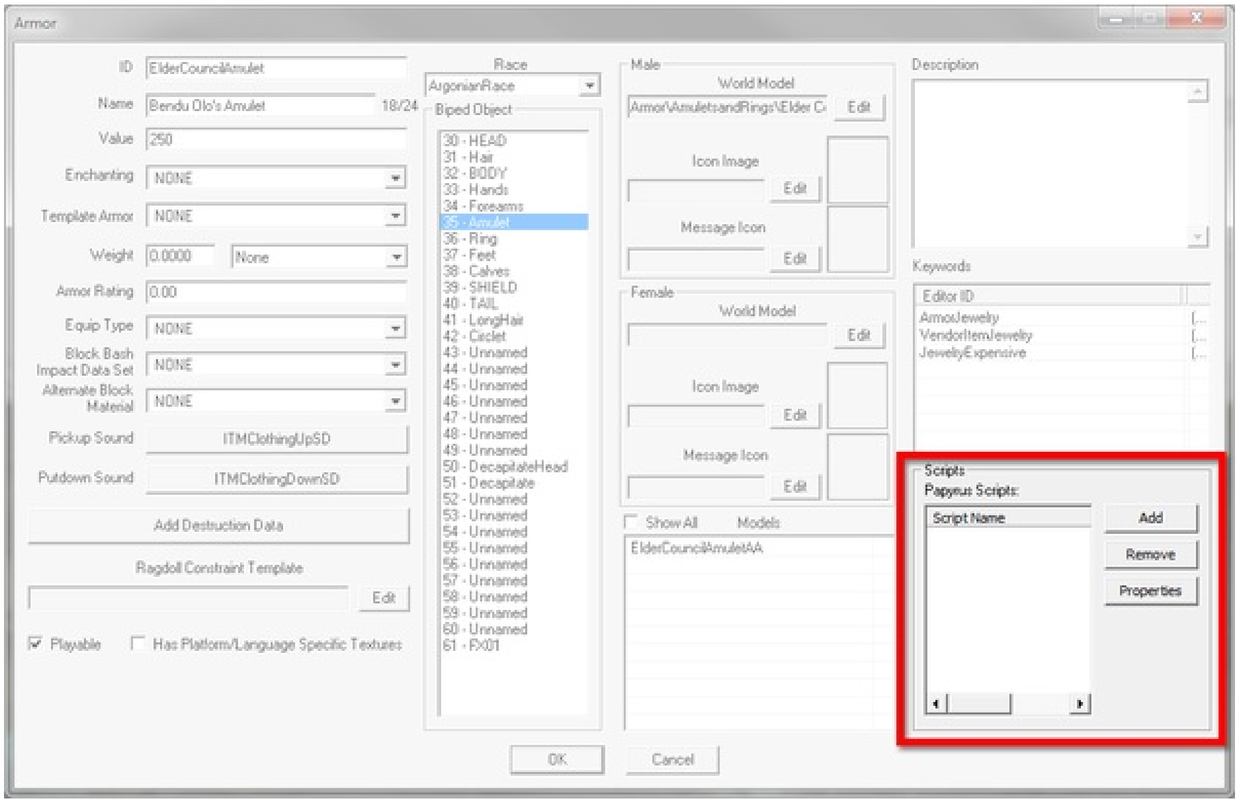
Save Succeeded   Line 7\10

If you see anything else in there, you typed something wrong. Try again!

Once you're done, close the script windows and the actor window, and save your plugin. Now it's time to script the amulet itself.

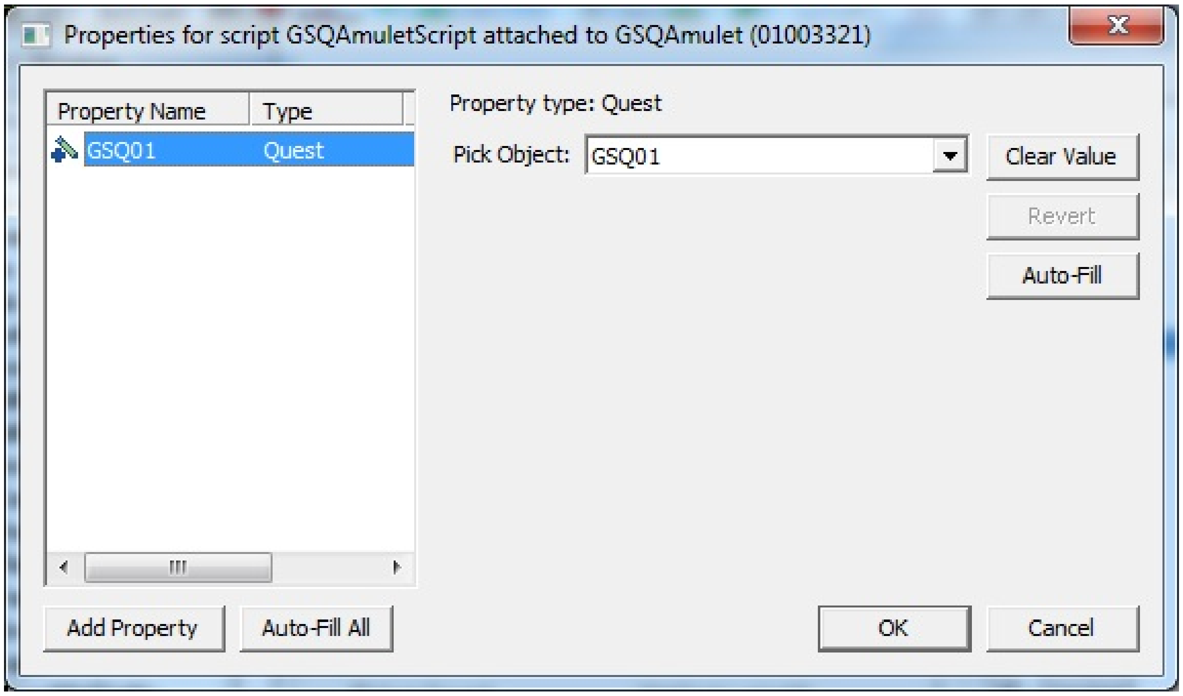
Scripting the Amulet

Open up the GSQAmulet item we created in the last tutorial. In the armor window, the scripts area is on the far right.


Armor

ID: ElderCouncilAmulet
Name: Bendu Olo's Amulet 18/24
Value: 250
Enchanting: NONE
Template Armor: NONE
Weight: 0.0000 None
Armor Rating: 0.00
Equip Type: NONE
Block Bash Impact Data Set: NONE
Alternate Block Material: NONE
Pickup Sound: ITMClothingUpSD
Putdown Sound: ITMClothingDownSD
Race: ArgonianRace
Biped Object: 35 - Amulet
Male World Model: Armor\AmuletsandRings\Elder C
Models: ElderCouncilAmuletAA
Keywords: ArmorJewelry, VendorItemJewelry, JewelryExpensive
[✓ Playable] Has Platform/Language Specific Textures

Create a new script just like we did before, and call it GSQAmuletScript. Add a Quest property to it, but to see a nifty trick, call it "GSQ01" instead of "TutorialQuest" this time.


Properties for script GSQAmuletScript attached to GSQAmulet (01003321)

Property Name	Type
GSQ01	Quest

Property type: Quest
Pick Object: GSQ01

It automatically set the value of the property for you, since you gave the property a name that matches an existing ID. If you're declaring a lot of properties, this can save you a bunch of time.

Open up the script, and we're going to add an event to it. The amulet can't die (obviously), but we do want to know when the player picks it up. Our event script will look like this:

```
Event OnContainerChanged(ObjectReference newContainer, ObjectReference oldContainer)
```

```
 if (newContainer == Game.GetPlayer())
               GSQ01.SetObjectivedisplayed(30)
  GSQ01.SetStage(30)
 endif
EndEvent
```

Ignore it once again. It will be explained in the section about objectives.

There a few things to note in this script:

- The parameters in the declaration (`newContainer` and `oldContainer`) will get filled in by the game when it tells this script to handle the event.
- Because the OnContainerChanged event will fire whenever this object changes hands, we need to make sure we only set the stage when it's the player taking it, hence the `if`/`endif` block.
- `Game.GetPlayer()` is a convenient way to get a reference to the player without needing to set a property, and `newContainer` was filled by the engine when this event fired, so we can do a comparison in the second line to make sure the item is moving into the player.
- The way this script is written, SetStage will be called every time the player picks up the amulet. This doesn't matter because each quest stage can only happen once - calling SetStage(30) has no effect after the first time.

This script is also good to go, then. Close the script and armor windows, and save your plugin.

You can now play through the quest from start to finish, checking the console with SQV to see its stage changing.

Players can't be expected to use the console, though, so we'll learn how to give them better feedback about the quest in the next chapter.

The scripts for Skyrim are just text files that live in your data directory before they get compiled into bytecode. This means that if you've got a favorite text editor, you can use it to work on scripts. We've included setups for both Sublime Text and Notepad++ that provide syntax highlighting, some basic autocompletion, and compilation shortcuts. If you're going to get heavily into scripting, these tools can make your life a lot easier.

Notes

- Papyrus boxes can be temperamental after the wrong code is inserted. Okaying the form and returning to it and possibly restarting the CK can resolve.
- Removing a saved script from a papyrus box may not automatically remove the associated compiled pex in the script folder, which has an impact on testing in-game.