

A Guide to MM7 Modding  
Part Two  
Creature Control  
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# Introduction

This guide is designed to introduce the basic *requirements* for controlling created creatures within the Might and Magic VII gaming structure. The following activities will be performed in this guide.

1. Assign unique Group Numbers to the four *Shape Shifters* added on Emerald Island during Part One of this Guide series, and make them 'invisible'.
2. Assign a 'one-time' (QBit-controlled) *Local Event* upon entry to the Two Palms Tavern to make the *Shape Shifters* 'visible' (CodeSnippet1).
3. Assign a new *Global Event* to Rathbone to cause him to disappear, change topics, and be placed in the Two Palms Tavern (CodeSnippet2).
4. Develop *Debugging* skills by identifying and correcting a Game mod 'Bug'.

# Orientation

Creature control is accomplished through event programming sequences. In the MM7 game, events are either *local* or *global*.

**Local Events** are programming sequences that are limited to and assigned on a given map area. The 'trigger' for a local event is defined by a local graphic, 2D Event, sprite, map coordinate, or elapsed time. Each map area has its own unique set of *local events*. Local events are primarily stored in the map-area *.EVT* databases in file *Events.lod*.

**Global Events** are programming sequences that may be executed independently of party location. A majority of *global events* are 'triggered' by selecting an *NPC Topic* or a *global sprite* (such as a Pedestal, barrel, et al). Most global events are stored in the *GLOBAL.EVT* database in the file *Events.lod*. Some global events have been placed into the main game *.exe* file.

Most *game events* are controlled by the *Event Language*. This language contains about 35 *instruction-types* that use the following syntax 'presentation'; an OpCode (2-bytes), an event number (4-bytes), a sequence number (2-bytes) and Qualifiers, Arguments, and Parameters (byte-size and content dependent upon instruction-type). The following survey of the *Show* instruction-type ('08' OpCode) illustrates this syntax 'presentation'; where 'e' is the event number, 's' is the sequence number, the number in ***Bold-Italic*** is the *Qualifier*, and the remaining number is the *Parameter*.

```
08eeeeess 16 13000000 Show NPC 0x13
08eeeeess 1E 13000000 Show NPC text 0x13
08eeeeess 1D 13000000 Show Local text 0x13
08eeeeess 02 13000000 Show 2DEvt 0x13
```

# Orientation (concluded)

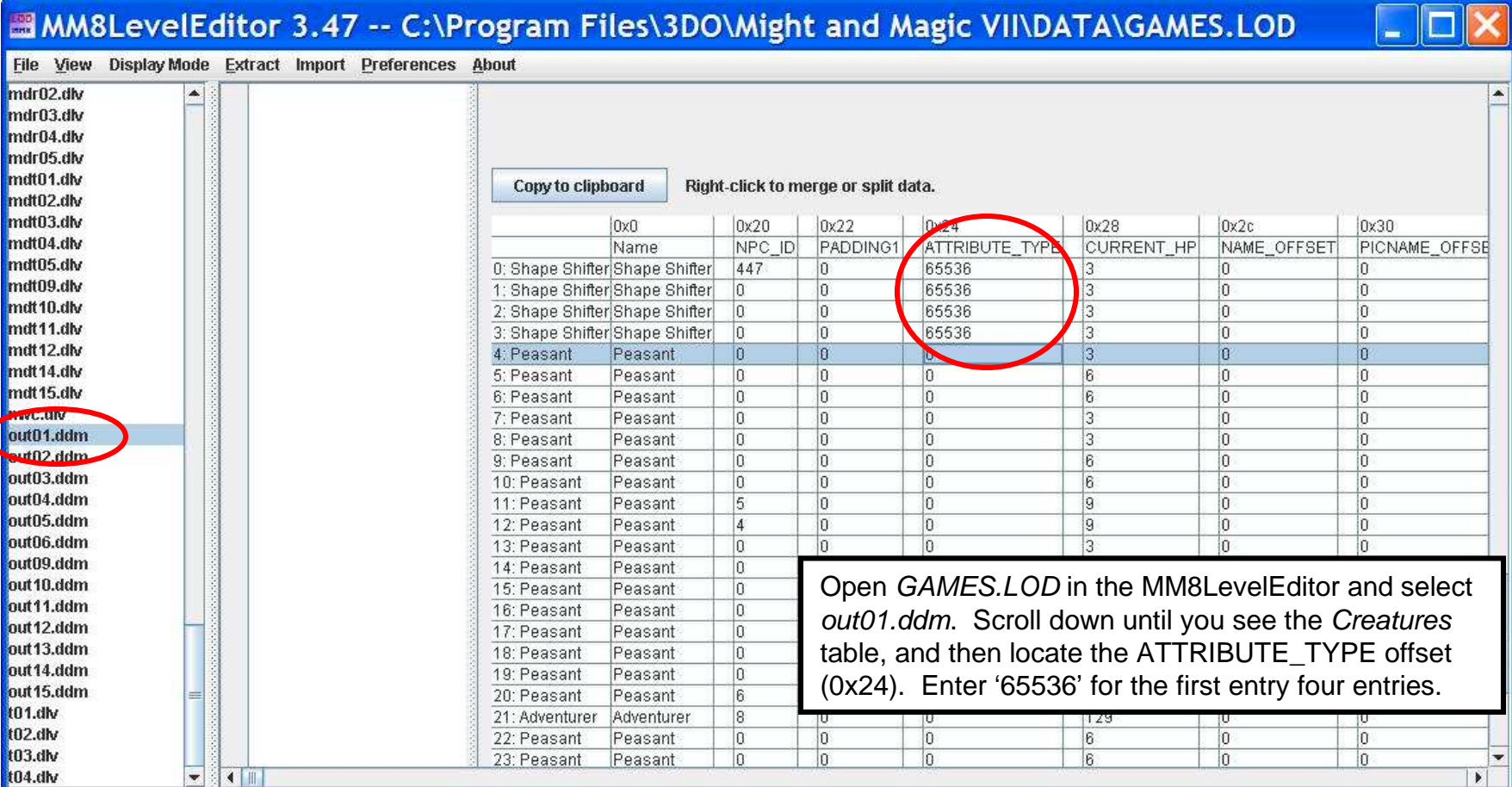
Game events are implemented within an *event sequence*. The following excerpt from Out01.evt (Emerald Island) illustrates a 'parsed' and 'commented' event sequence. Note that the Event Number is 0x73 and that the Event Sequence starts at '00' and extends to '0C'. For additional event sequences, see the *Out01.Evt.PDF* file.

## ***Money Well***

```
05730000 0404 Mouseover 2D evt#4
0B730000 0E7F 0003000000009 Branch to 9 if 7F = 3
0B730001 0E7E 0001000000009 Branch to 9 if 7E = 1
0B730002 0E15 00C9000000009 Branch to 9 if gold = 200
0B730003 0E26 000F000000005 Branch to 5 if Luck = 15
05730004 2409 GOTO 9
0A730005 107E 0001000000 Modify by Adding 1 to 7E
0A730006 1015 00E8030000 Modify by Adding 0x3E8 (1000)to Party Gold
0A730007 107F 0001000000 Modify by Adding 1 to 7F
05730008 240A GOTO A
08730009 1D 0B000000 Show local text 0x0B Refreshing!
0573000A 0100 Stop Processing
0E73000B 26 00000100000000000000 Execute Next on Elapsed Time (1 week)
0A73000C 127E 0000000000 Modify by Setting 7E to '0'
```

# Activity 1

Assign Invisibility Attribute.



The screenshot shows the MM8LevelEditor 3.47 interface. The left pane lists files, with **out01.ddm** selected. The right pane displays a table of creature data. The **ATTRIBUTE\_TYPE** column (offset 0x24) for the first four entries is circled in red.

	0x0	0x20	0x22	0x24	0x28	0x2c	0x30
	Name	NPC_ID	PADDING1	ATTRIBUTE_TYPE	CURRENT_HP	NAME_OFFSET	PICNAME_OFFSET
0: Shape Shifter	Shape Shifter	447	0	65536	3	0	0
1: Shape Shifter	Shape Shifter	0	0	65536	3	0	0
2: Shape Shifter	Shape Shifter	0	0	65536	3	0	0
3: Shape Shifter	Shape Shifter	0	0	65536	3	0	0
4: Peasant	Peasant	0	0	0	3	0	0
5: Peasant	Peasant	0	0	0	6	0	0
6: Peasant	Peasant	0	0	0	6	0	0
7: Peasant	Peasant	0	0	0	3	0	0
8: Peasant	Peasant	0	0	0	3	0	0
9: Peasant	Peasant	0	0	0	6	0	0
10: Peasant	Peasant	0	0	0	6	0	0
11: Peasant	Peasant	5	0	0	9	0	0
12: Peasant	Peasant	4	0	0	9	0	0
13: Peasant	Peasant	0	0	0	3	0	0
14: Peasant	Peasant	0					
15: Peasant	Peasant	0					
16: Peasant	Peasant	0					
17: Peasant	Peasant	0					
18: Peasant	Peasant	0					
19: Peasant	Peasant	0					
20: Peasant	Peasant	6					
21: Adventurer	Adventurer	8	0	0	129	0	0
22: Peasant	Peasant	0	0	0	6	0	0
23: Peasant	Peasant	0	0	0	6	0	0

Open *GAMES.LOD* in the MM8LevelEditor and select *out01.ddm*. Scroll down until you see the *Creatures* table, and then locate the *ATTRIBUTE\_TYPE* offset (0x24). Enter '65536' for the first entry four entries.

# Activity 1 (continued)

Assign Creature Groups.

MM8LevelEditor 3.47 -- C:\Program Files\3DO\Westwood Games\MM8\DATA\GAMES.LOD

File View Display Mode Extract Import Preferences About

Quick-append currently-displayed resource  
currently-displayed resource  
Quick-append selected file  
Selected files  
All

Save In: DATA

File Name: GAMES.LOD.new  
Files of Type: All Files

Progress...  
Please wait.  
Importing...  
Reusing data d33.blv

Scroll to the right until you locate the GROUP offset (0x2C4). Enter Group '10' for the first entry (Rathbone) and '9' for the next three entries.

Select the fifth line.

Import the currently-displayed resource.

	0x2bb	0x2bc	0x2c4	0x2c8	0x2cc	0x2ce	0x2d0	0x2d2
#4:owner	ContainedItem#4:padding	ContainedItem#4:time	GROUP	SUMMONER_ID	Schedule#1:x	Schedule#1:y	Schedule#1:z	Schedule#1:attribut
out01.ddm	0	January 1, 1165 0:0:0	10	0	0	0	0	0
out02.ddm	0	January 1, 1165 0:0:0	9	0	0	0	0	0
out03.ddm	0	January 1, 1165 0:0:0	9	0	0	0	0	0
out04.ddm	0	January 1, 1165 0:0:0	9	0	0	0	0	0
out05.ddm	0	January 1, 1165 0:0:0	1	0	0	0	0	0
out06.ddm	0	January 1, 1165 0:0:0	0					
out09.ddm	0	January 1, 1165 0:0:0	0					
out10.ddm	0	January 1, 1165 0:0:0	1					
out11.ddm	0	January 1, 1165 0:0:0	0					
out12.ddm	0	January 1, 1165 0:0:0	0					
out13.ddm	0	January 1, 1165 0:0:0	0					
out14.ddm	0	January 1, 1165 0:0:0	0					
out15.ddm	0	January 1, 1165 0:0:0	0					
t01.dlv	0	January 1, 1165 0:0:0	1					
t02.dlv	0	January 1, 1165 0:0:0	1					
t03.dlv	0	January 1, 1165 0:0:0	0					
t04.dlv	0	January 1, 1165 0:0:0	0					

# Activity 1 (concluded)

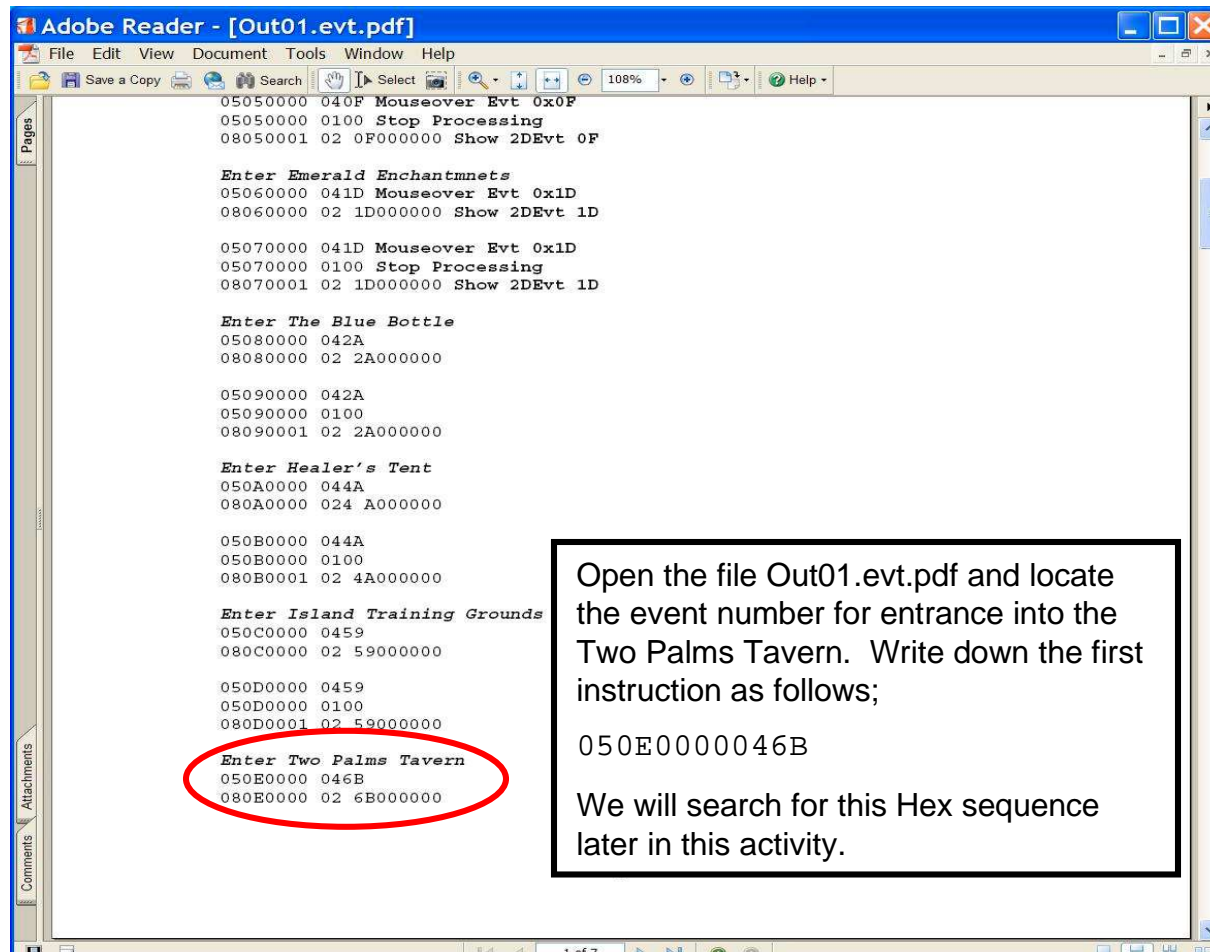
**Verify your changes.**

It's now time to verify the file changes.

1. Exit the MM8LevelEditor.
2. Delete the current *GAMES.LOD* file.
3. Rename the *GAMES.LOD.new* file to *GAMES.LOD*.
4. Launch MM7 and Start a New Game.
5. Verify that the four *Shape Shifters* do *not* appear around the Campfire.
6. Exit the game and proceed to Activity 2.

# Activity 2

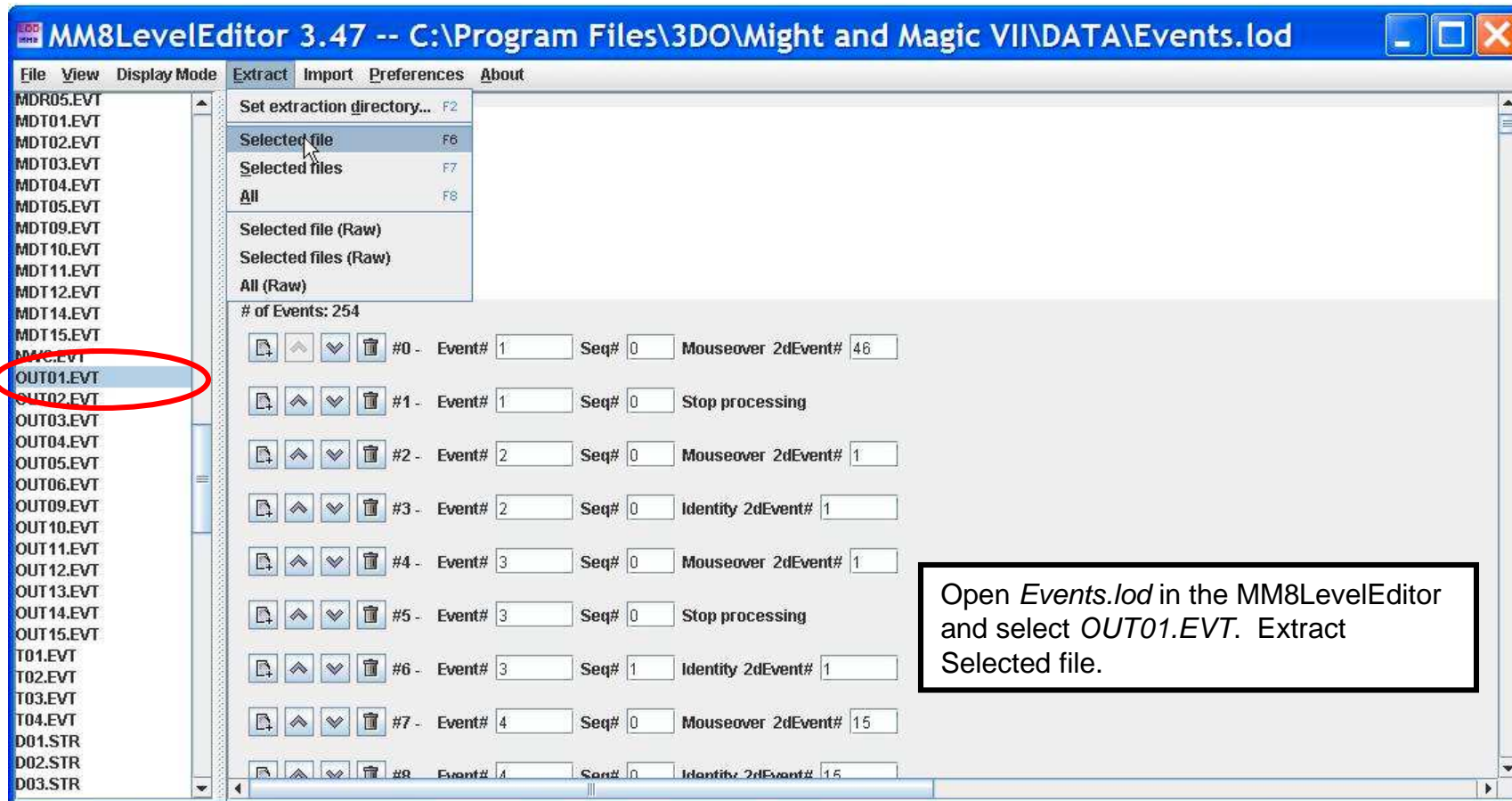
Locate the *Enter Two Palms Tavern* event in Out01.Evt.





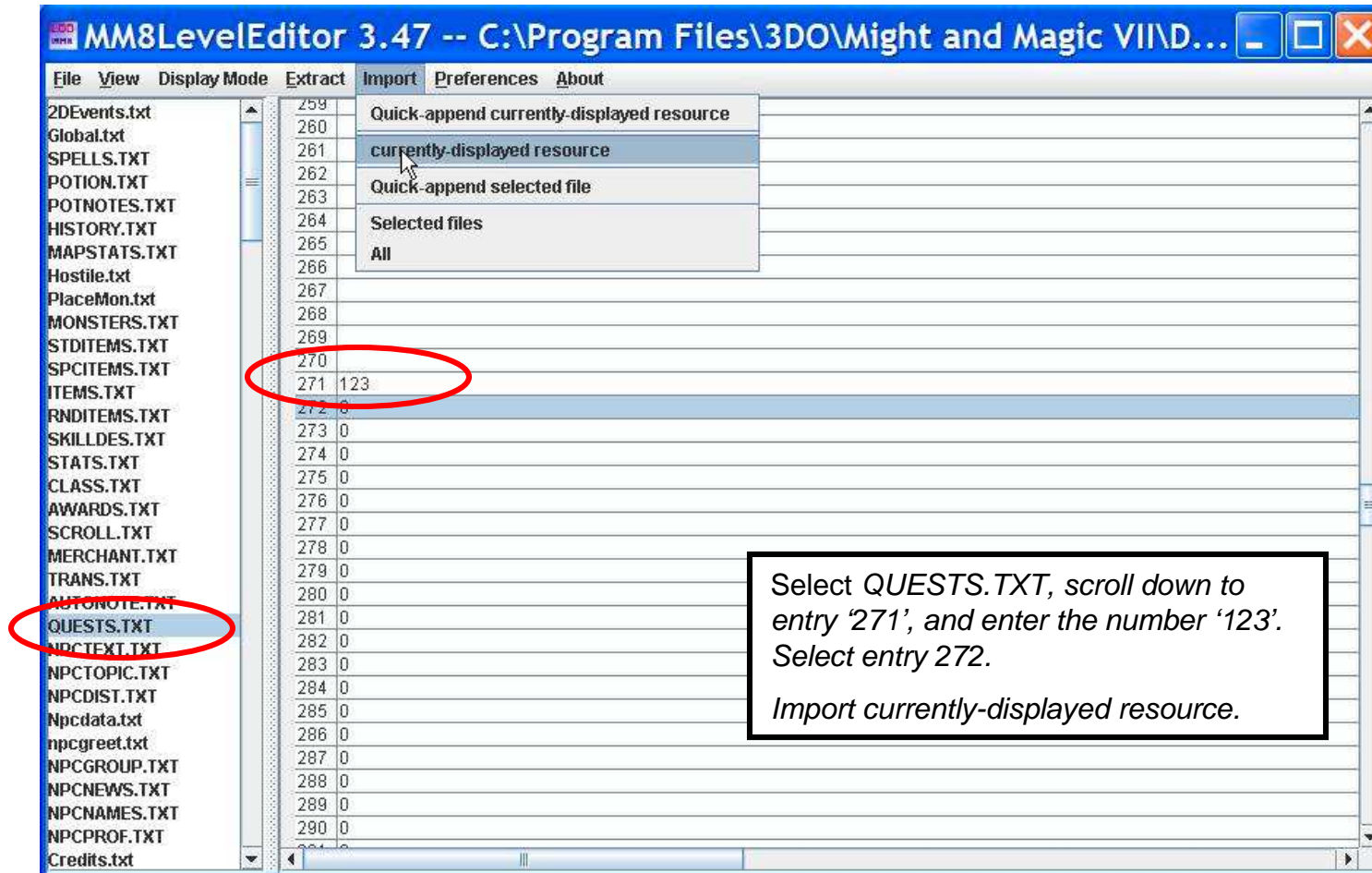
# Activity 2 (continued)

Extract Out01.Evt.



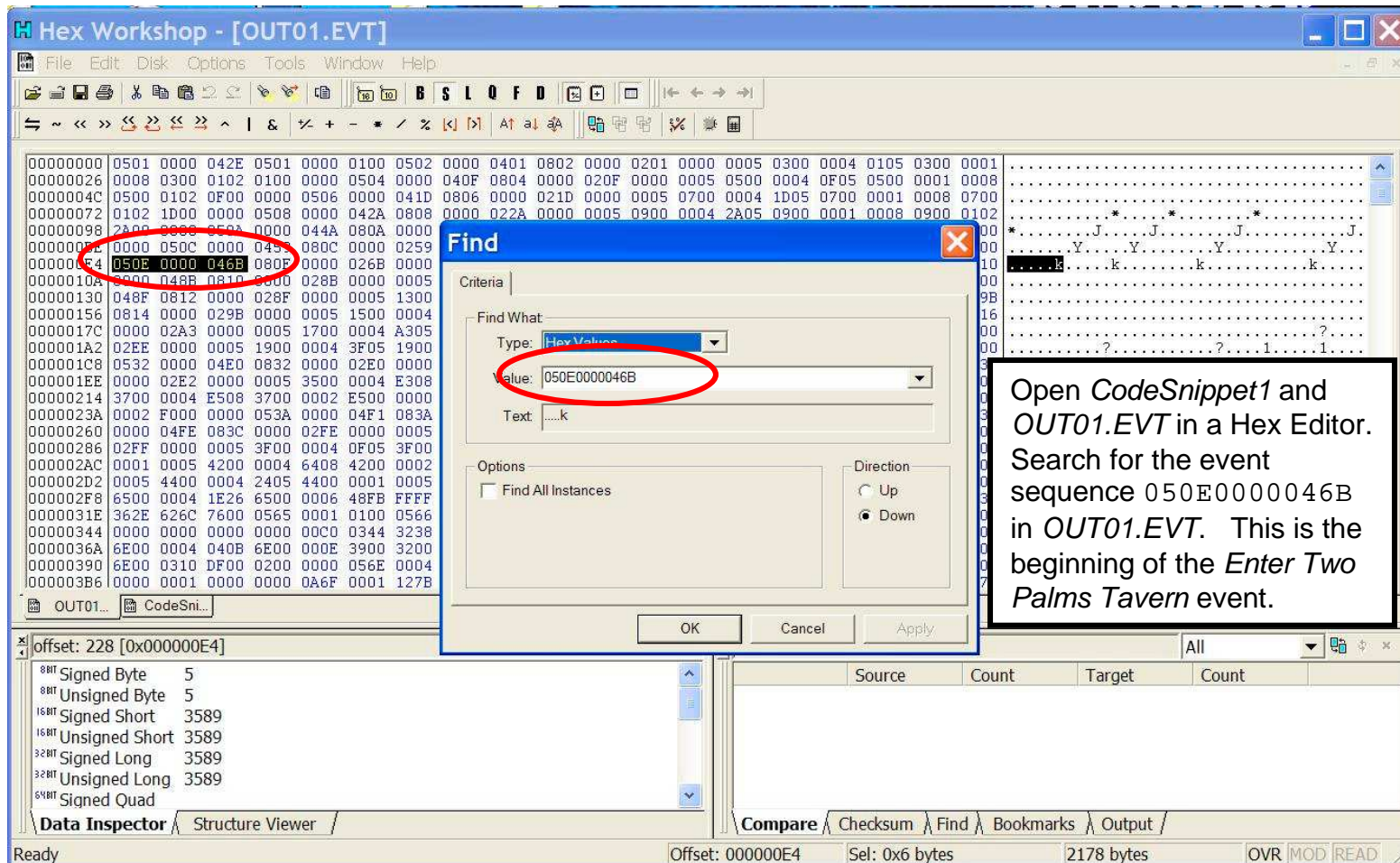
# Activity 2 (continued)

Set QBit for Debug.



# Activity 2 (continued)

Locate *Enter Two Palms Tavern* event.



The screenshot shows the Hex Workshop application with the file OUT01.EVT open. The main window displays a hex dump of the file. A red circle highlights the hex value 050E0000046B in the hex dump. A Find dialog box is open, showing the search criteria. The 'Find What' field is set to 'Hex Values' and the 'Value' field is set to 050E0000046B. The 'Text' field is empty. The 'Options' section has 'Find All Instances' checked. The 'Direction' section has 'Up' selected. The 'Data Inspector' panel at the bottom shows the structure of the file, with the 'Signed Quad' field highlighted. A text box on the right side of the screenshot provides instructions: 'Open CodeSnippet1 and OUT01.EVT in a Hex Editor. Search for the event sequence 050E0000046B in OUT01.EVT. This is the beginning of the Enter Two Palms Tavern event.'

Hex Workshop - [OUT01.EVT]

File Edit Disk Options Tools Window Help

Find

Criteria

Find What

Type: Hex Values

Value: 050E0000046B

Text: ....k

Options

☐ Find All Instances

Direction

☐ Up

☒ Down

OK Cancel Apply

offset: 228 [0x000000E4]

8BT Signed Byte 5

8BT Unsigned Byte 5

16BT Signed Short 3589

16BT Unsigned Short 3589

32BT Signed Long 3589

32BT Unsigned Long 3589

64BT Signed Quad

Data Inspector Structure Viewer

Compare Checksum Find Bookmarks Output

Offset: 000000E4 Sel: 0x6 bytes 2178 bytes OVR MOD READ

Open CodeSnippet1 and OUT01.EVT in a Hex Editor. Search for the event sequence 050E0000046B in OUT01.EVT. This is the beginning of the Enter Two Palms Tavern event.



# Activity 2 (continued)

Select all code in event 0x0E.

Hex Workshop - [OUT01.EVT]

File Edit Disk Options Tools Window Help

050E000046B080E0000026B0000000

Carefully select all code in this event.

050E000046B080E0000026B0000000

We will replace this code with CodeSnippet1.

offset: 228 [0x000000E4]

8BIT	Signed Byte	5
8BIT	Unsigned Byte	5
16BIT	Signed Short	3589
16BIT	Unsigned Short	3589
32BIT	Signed Long	3589
32BIT	Unsigned Long	3589
64BIT	Signed Quad	1011175781268721157

Data Inspector Structure Viewer

Compare Results

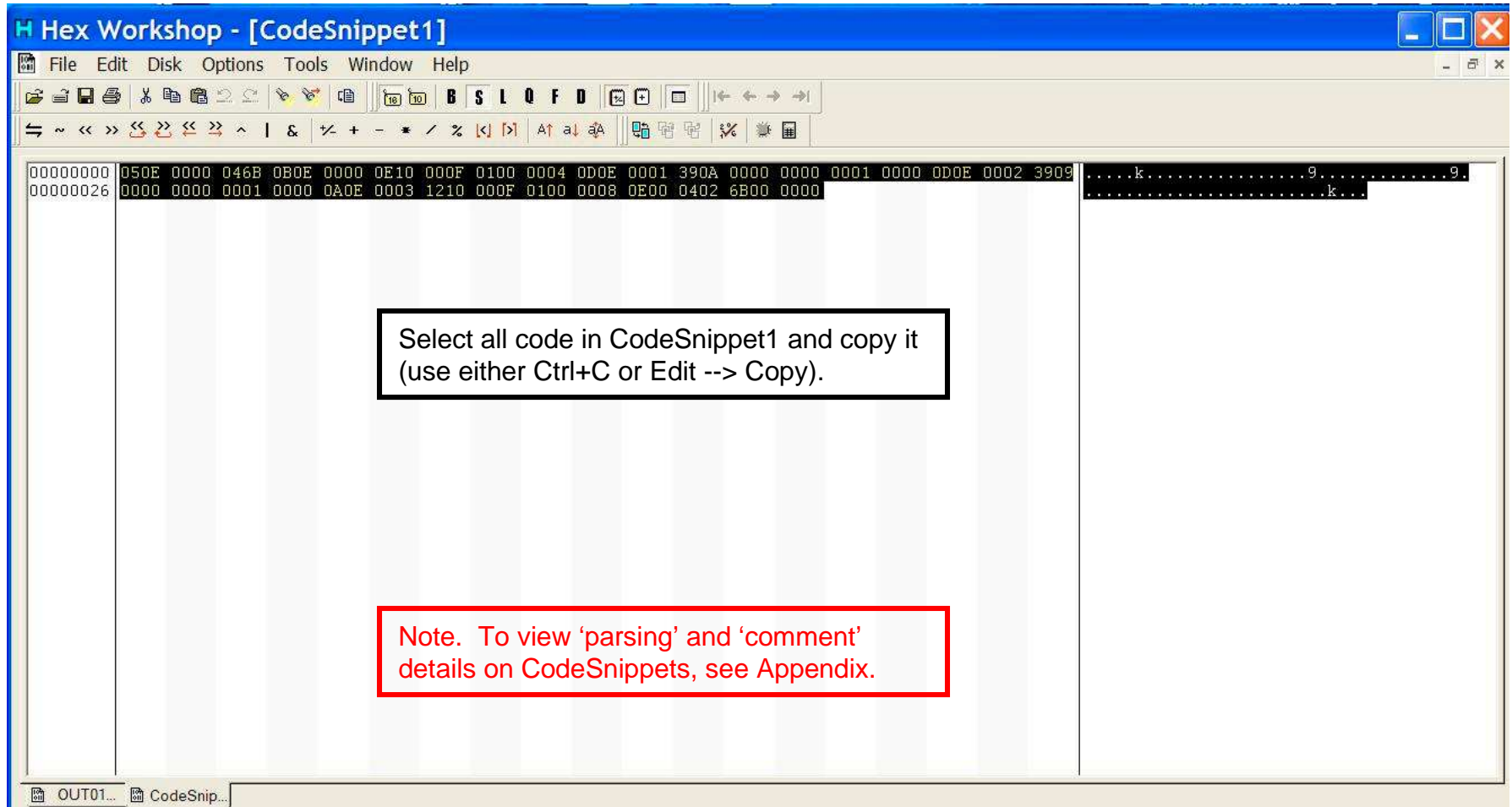
Source	Count	Target	Count
--------	-------	--------	-------

Compare Checksum Find Bookmarks Output

Offset: 000000E4 Sel: 0xf bytes 2178 bytes OVR MOD READ

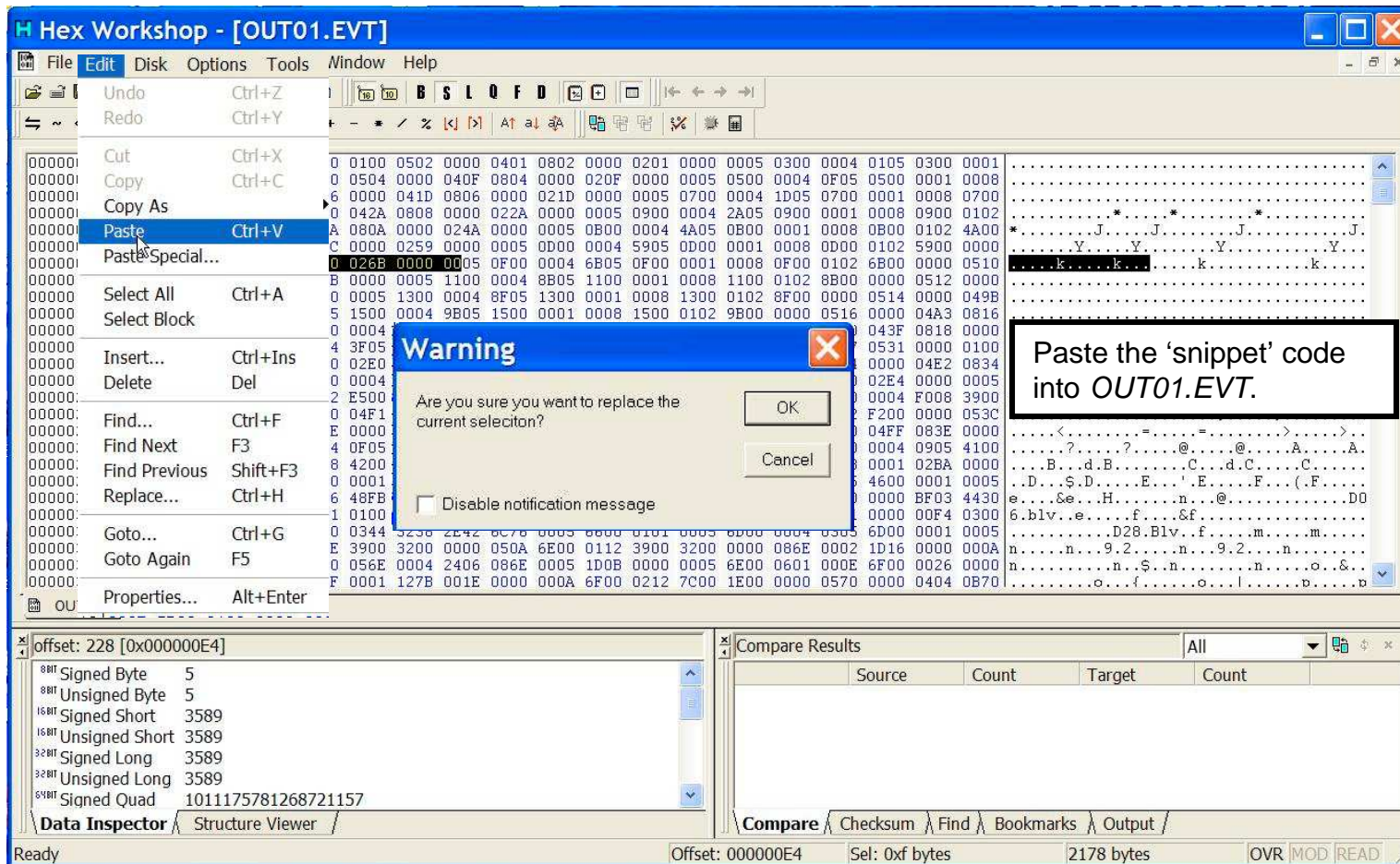
# Activity 2 (continued)

Copy CodeSnippet1.



# Activity 2 (continued)

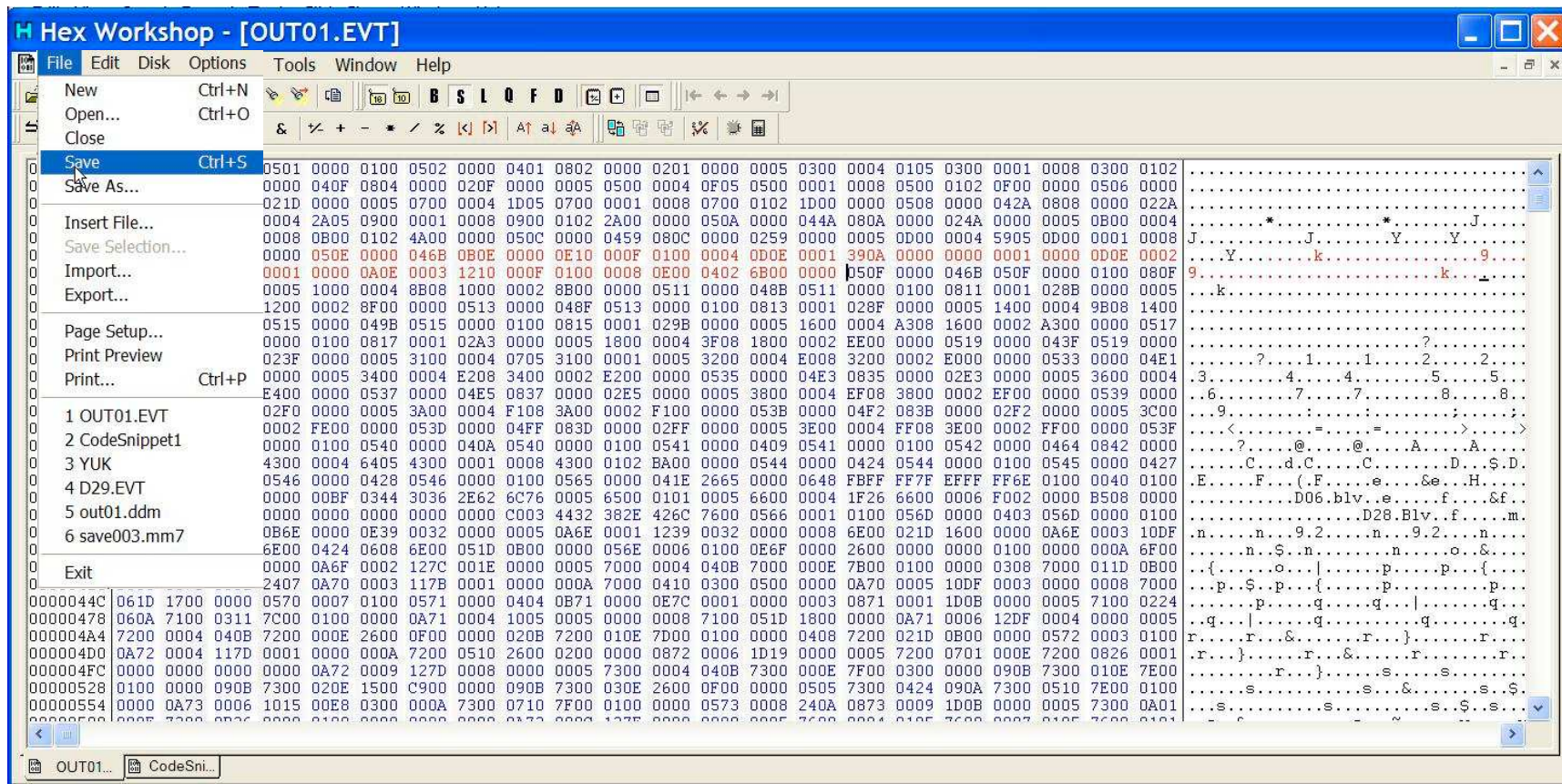
Paste CodeSnippet1.



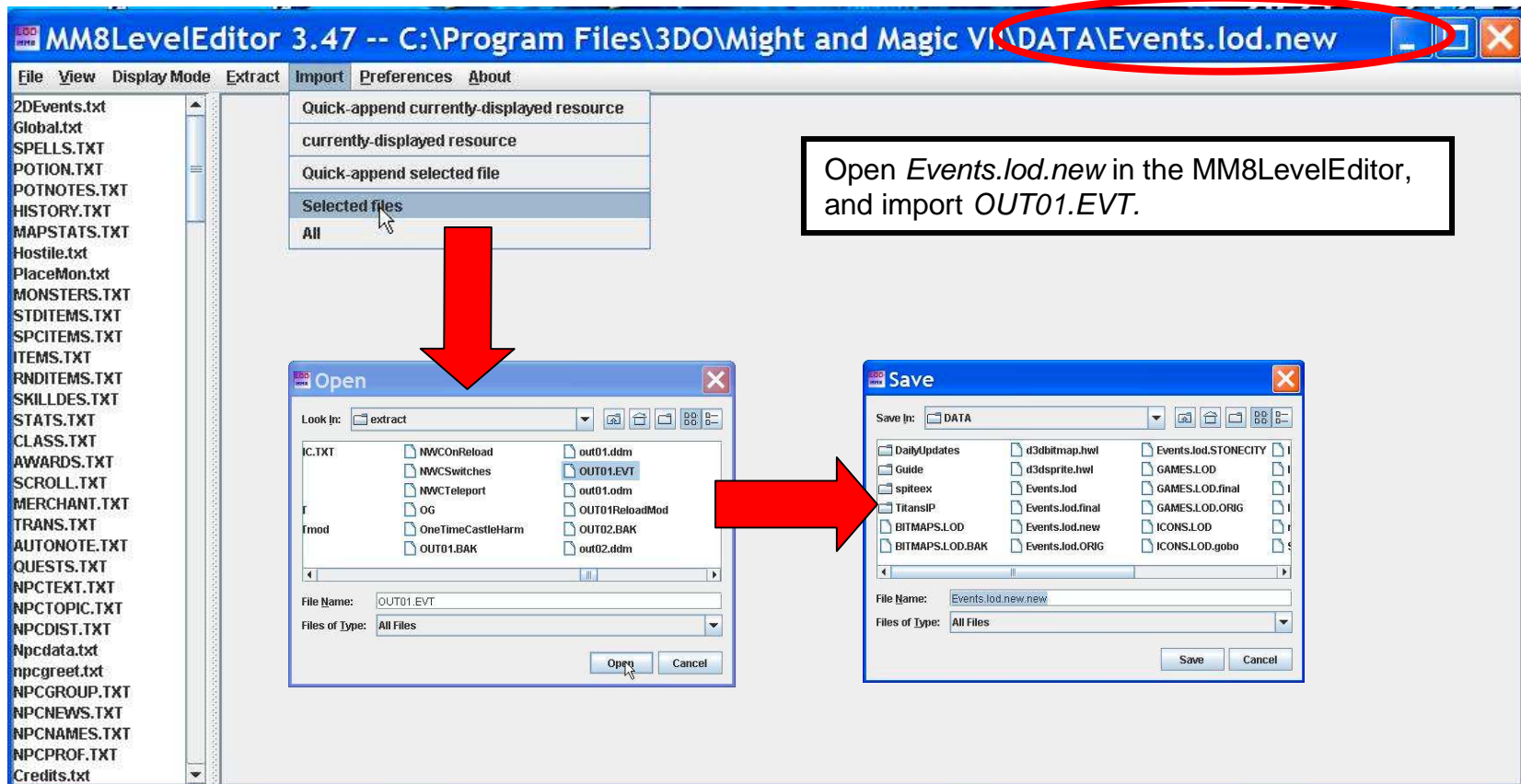


# Activity 2 (continued)

SAVE the file.



## Import OUT01.EVT.





# Activity 2 (concluded)

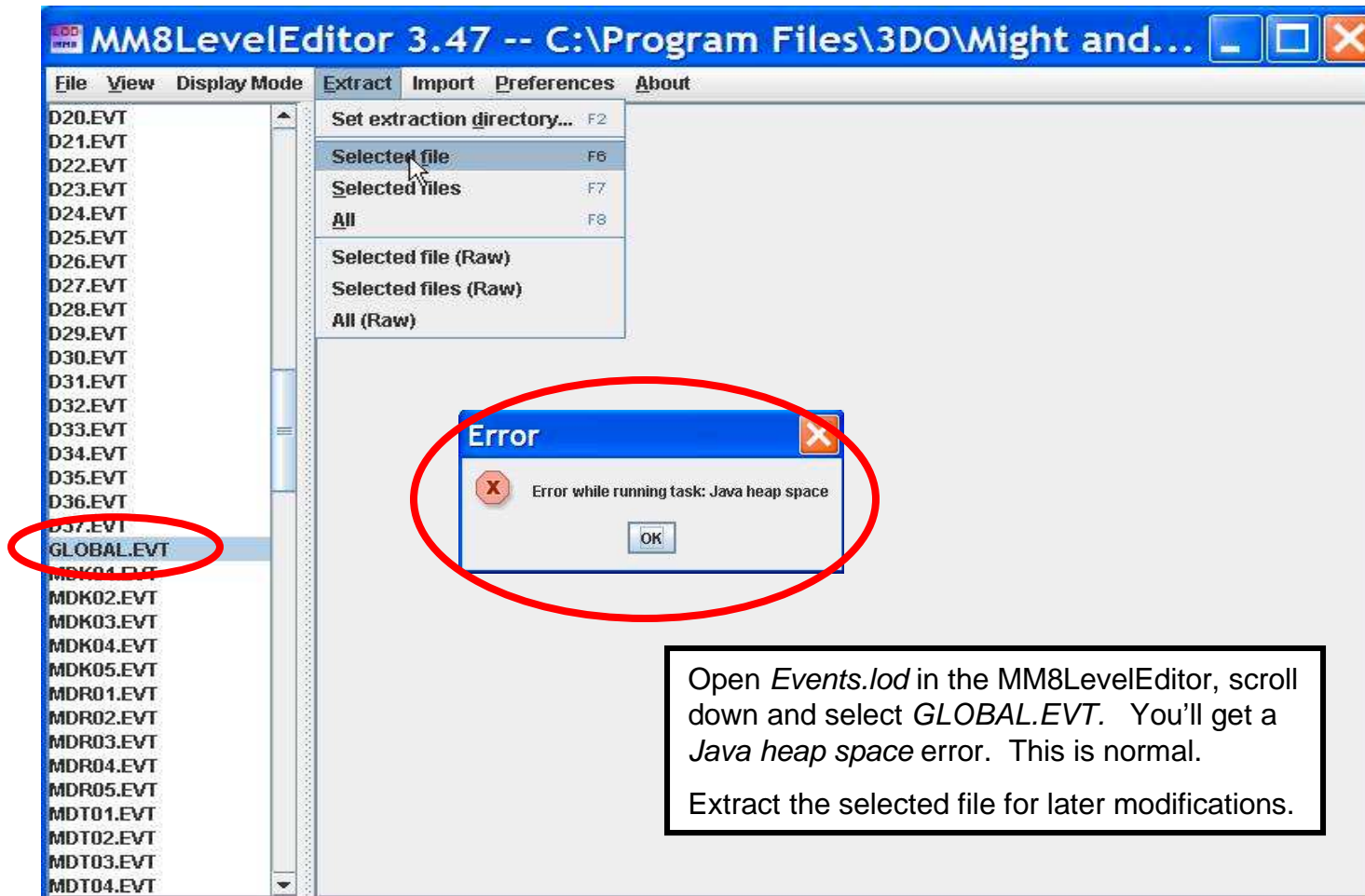
**Verify changes.**

It's now time to verify the file changes.

1. Exit the MM8LevelEditor.
2. Delete the current *Events.lod*, and *Events.lod.new* files.
3. Rename the *Events.lod.new.new* file to *Events.lod*.
4. Launch MM7 and Start a New Game.
5. Note again that the Shape Shifters are not 'visible'.
6. Enter the Two Palms Tavern and then exit the tavern.
7. Note that the Shape Shifters are now 'visible'.
8. Check the party Quest Log. Note the new 'debug' entry of '123'.
9. Exit the game and proceed to Activity 3.

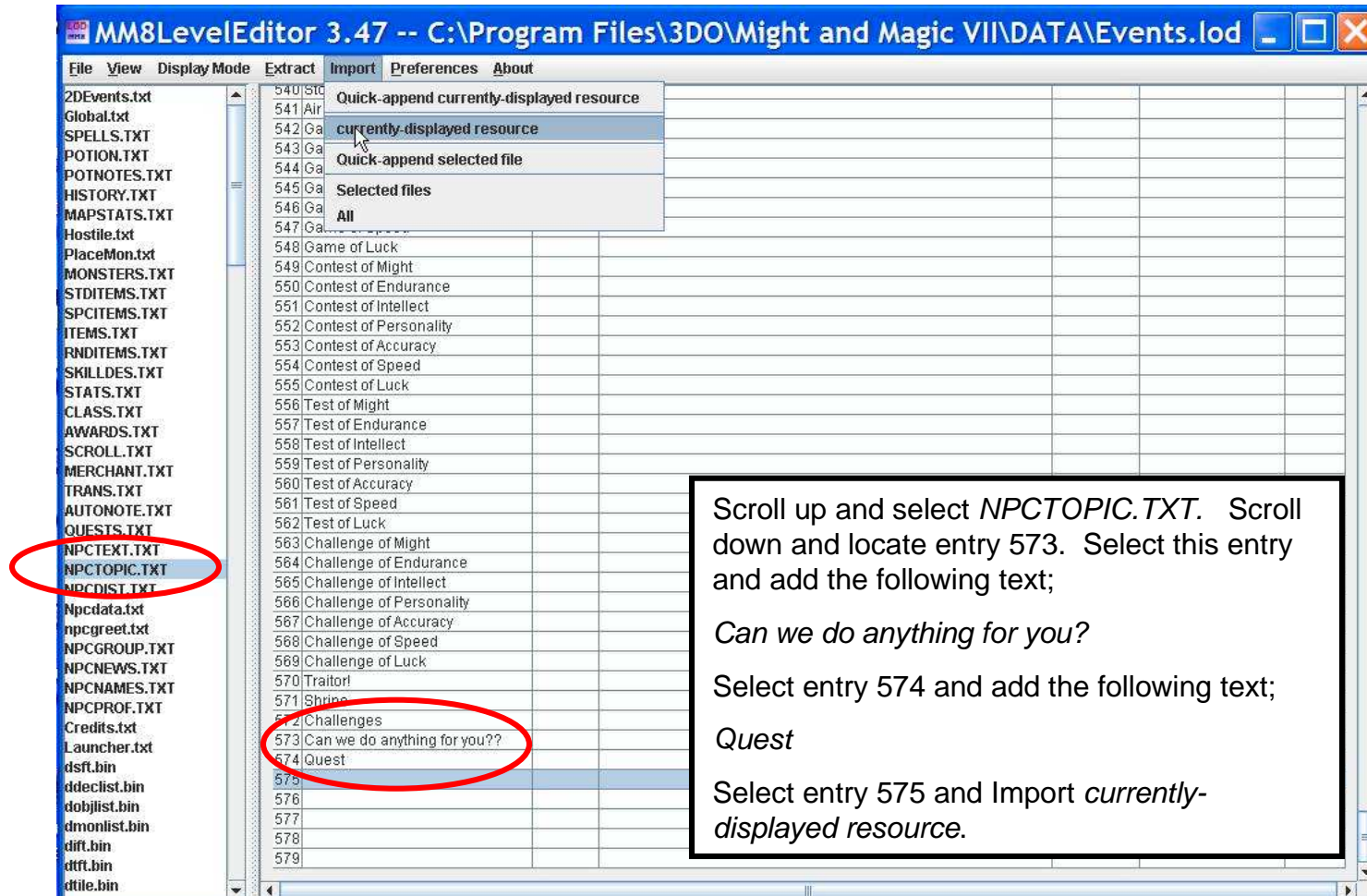
# Activity 3

Extract *GLOBAL.EVT*.



# Activity 3 (continued)

Add NPC Topics.



# Activity 3 (continued)

Add Topic to Rathbone.

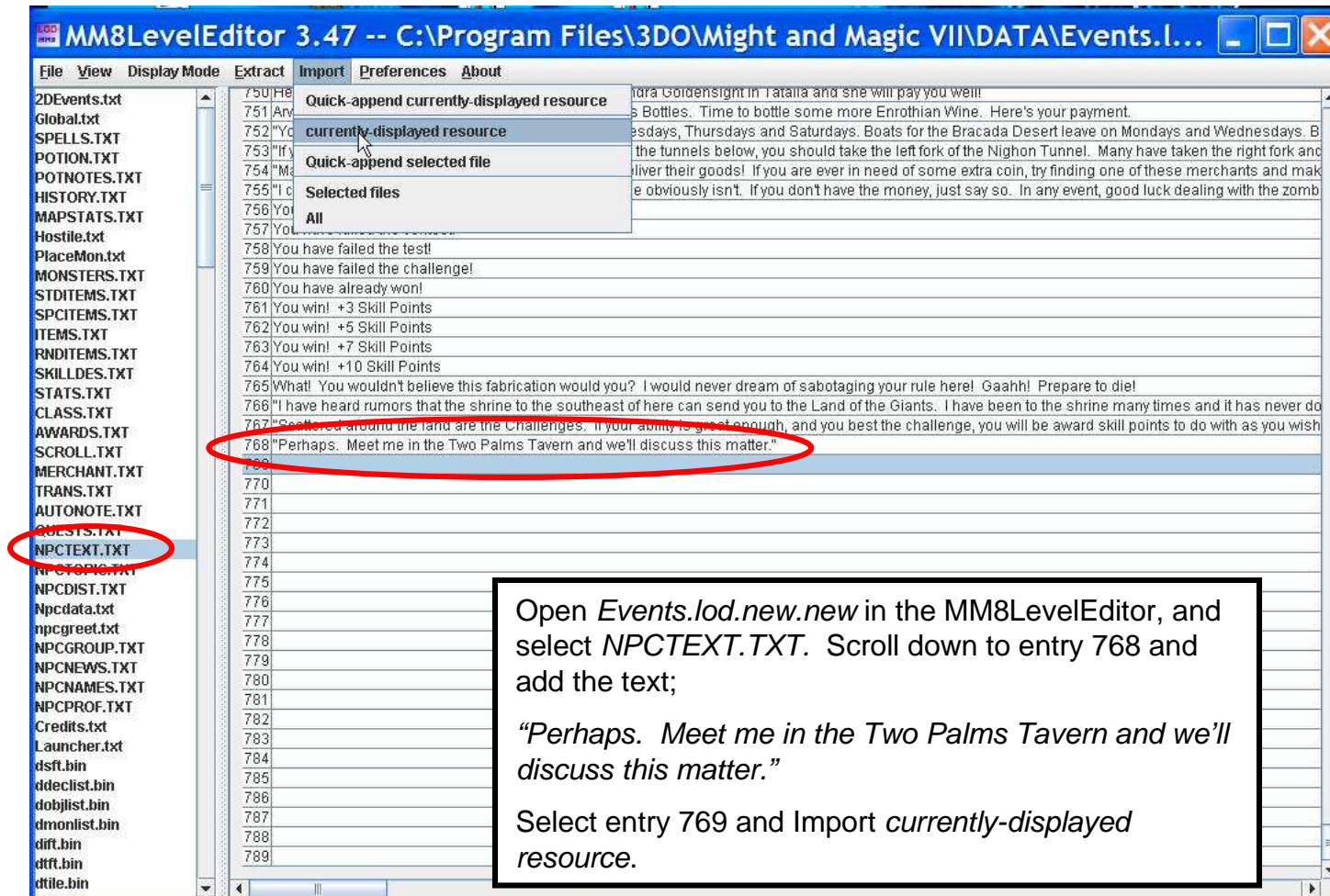
The screenshot shows the MM8LevelEditor 3.47 interface. The 'Save' dialog box is open, showing the file 'Events.lod.new' being saved in the 'DATA' directory. The file name is 'Events.lod.new.new'. The 'Files of Type' is set to 'All Files'. A red arrow points to the 'Import' menu in the main window. A red circle highlights the '573' topic value in the 'Rathbone' entry (entry 447) in the 'Events.lod.new' file.

Open *Events.lod.new* in the MM8LevelEditor, and select *Npcdata.txt*. Add topic '573' as indicated on entry 447 (Rathbone).

Select entry 448 and Import *currently-displayed resource*.

# Activity 3 (continued)

Add NPC text.



# Activity 3 (continued)

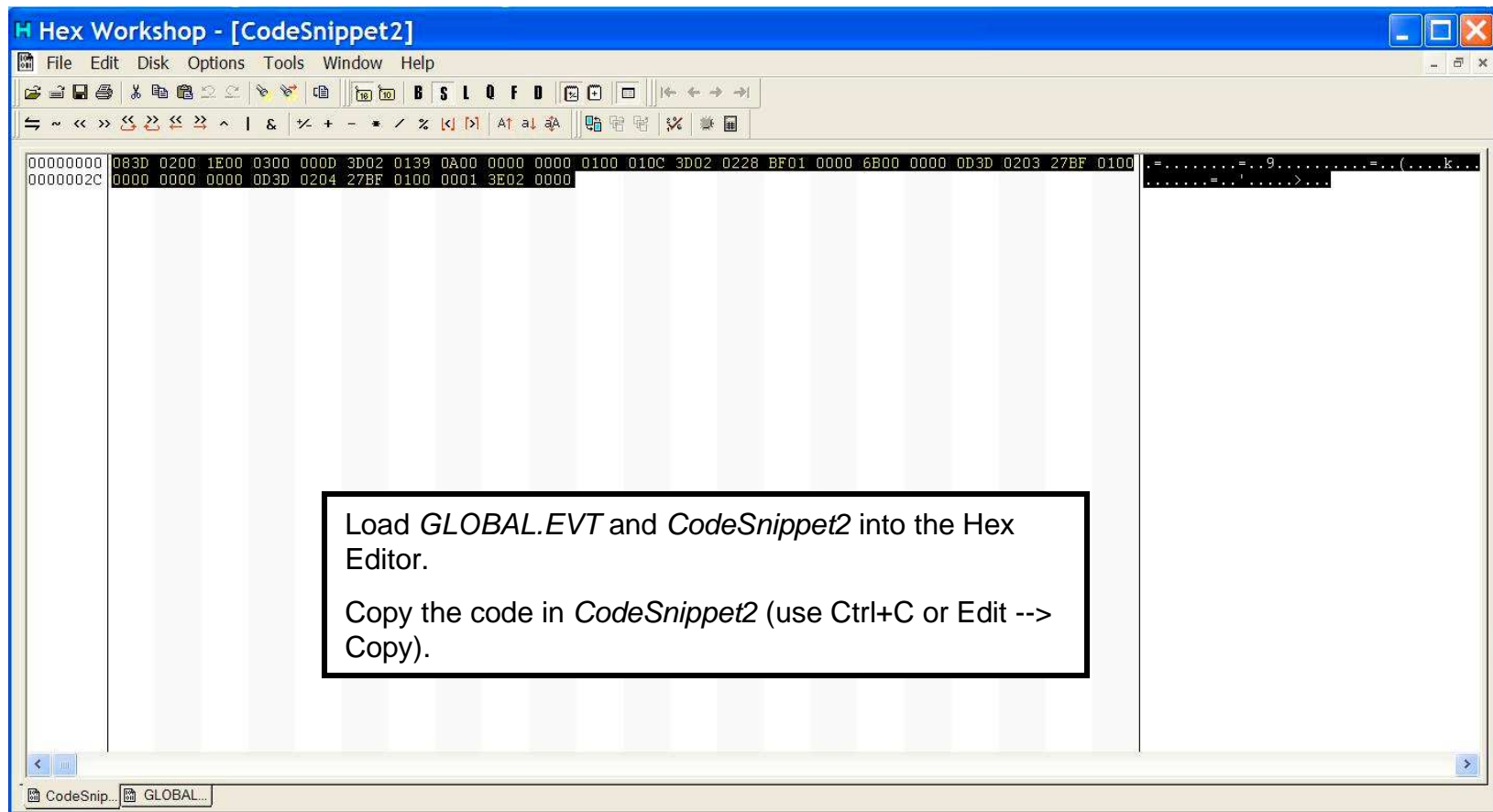
**Cleanup the files.**

Delete the files *Events.lod*, *Events.lod.new*, and *Events.lod.new.new*.  
Rename file *Events.lod.new.new.new* to *Events.lod*.



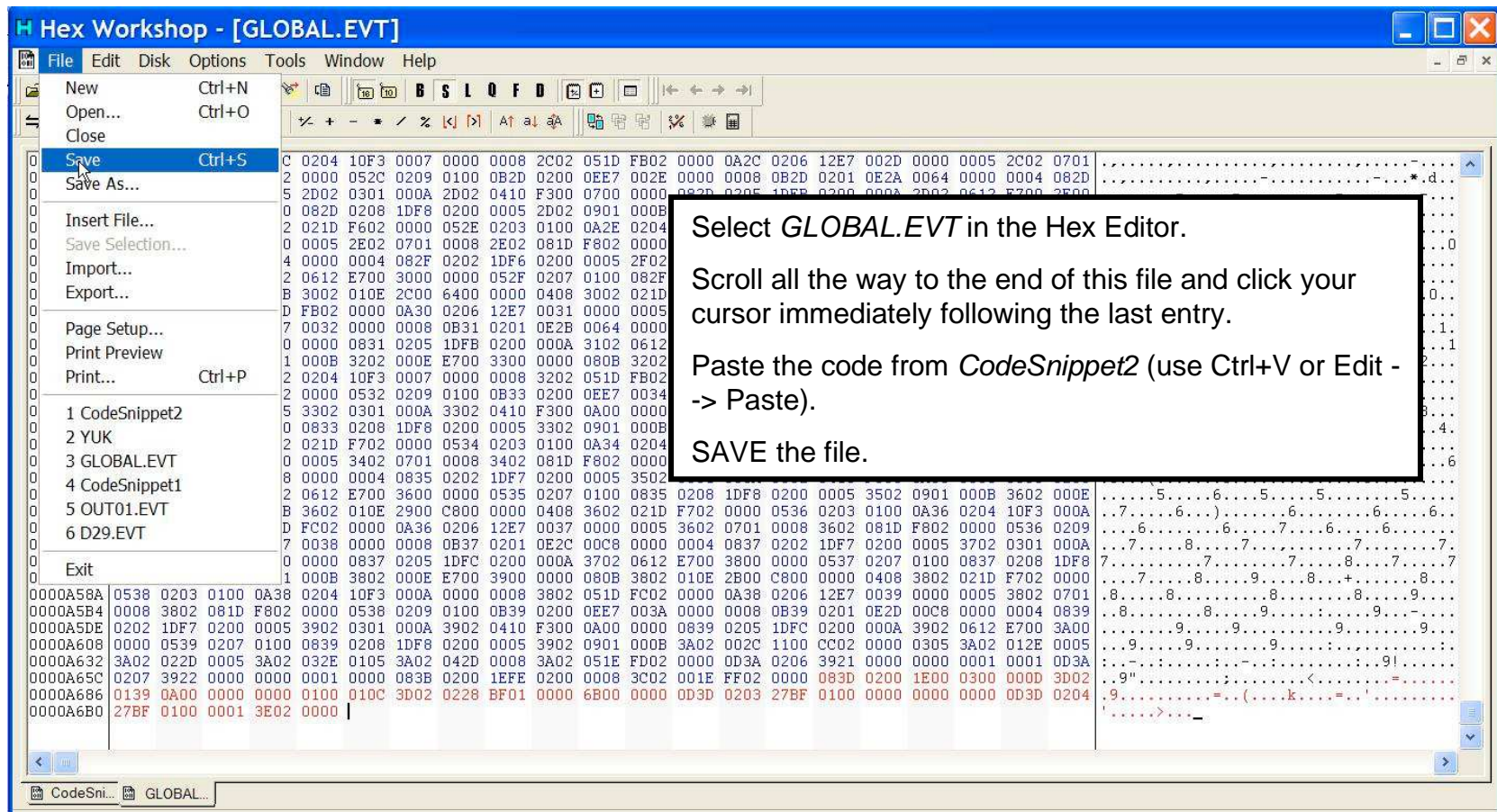
# Activity 3 (continued)

Copy *CodeSnippet2*.



# Activity 3 (continued)

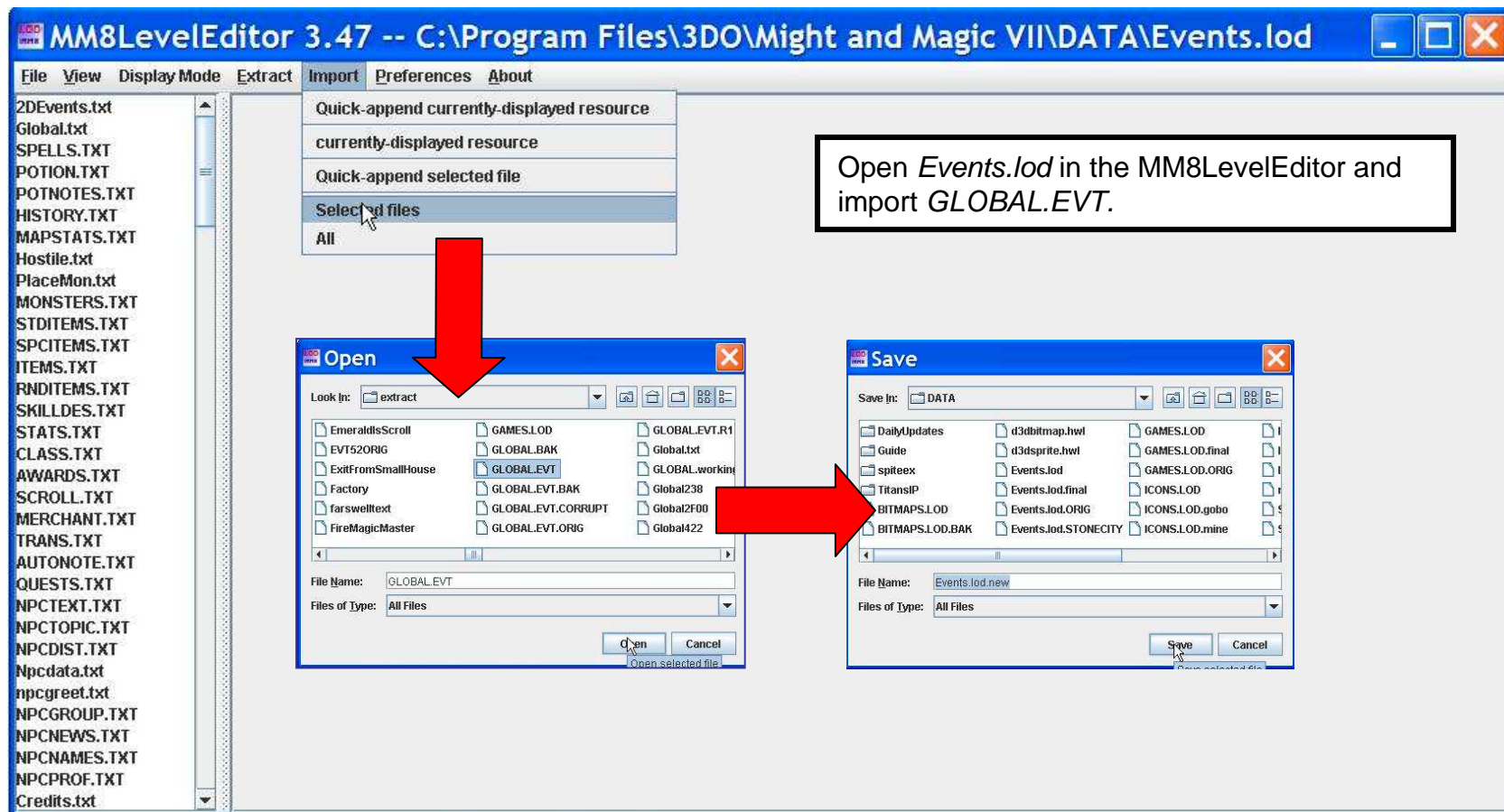
Paste *CodeSnippet2*.





# Activity 3 (continued)

Import *GLOBAL.EVT*.



# Activity 3 (concluded)

## Verify Changes.

It's now time to verify the file changes.

1. Exit the MM8LevelEditor.
2. Delete the current *Events.lod* file.
3. Rename the *Events.lod.new* file to *Events.lod*.
4. Launch MM7 and Start a New Game.
5. Note again that the Shape Shifters are not 'visible'.
6. Enter the Two Palms Tavern and then exit the tavern.
7. Note that the Shape Shifters are 'visible'.
8. Move your party to Rathbone (Priest of the Sun) and select him.
9. Note the initial greeting and the new Topic: *Can we do anything for you?*
10. Select the topic. Note that (1) The Priest of the Sun graphic has disappeared, (2) the Topic: *Can we do anything for you?* has disappeared, and (3) the text: *Perhaps. Meet me in the Two Palms Tavern and we'll discuss this matter.* is showing.
11. Close the encounter and enter the Two Palms Tavern. Note that Rathbone is now a 'resident' of the tavern.
12. Select Rathbone. Note that a new Topic: *Quest* appears. ***Do not select this topic or the game will 'crash'! The Rathbone Quest will not be addressed until Part 3 of this guide.***
13. Exit the game and proceed to Activity 4.

# Activity 4

## A Program Bug!

1. Launch MM7 and Start a New Game.
2. Note again that the Shape Shifters are not 'visible'.
3. Enter the Two Palms Tavern and then exit the tavern.
4. Note that the Shape Shifters are 'visible'.
5. Move your party to Rathbone (Priest of Light) and select him.
6. Note the initial greeting and the new Topic: *Can we do anything for you?*
7. Select the topic. Note that (1) The Priest of Light graphic has disappeared, (2) the Topic: *Can we do anything for you?* has disappeared, and (3) the text: *Perhaps. Meet me in the Two Palms Tavern and we'll discuss this matter.* is showing.
8. Close the encounter and enter the Two Palms Tavern. Note that Rathbone is now a 'resident' of the tavern.
9. Select Rathbone. Note that a new Topic: *Quest* appears. ***Do not select this topic or the game will 'crash'! The Rathbone Quest will not be addressed until Part 3 of this guide.***
10. Exit the tavern and move your party to the Campfire. Attempt to SAVE your game.
11. The Game has 'frozen'. You'll have to *Ctrl+Alt+Delete* and 'kill' the process to exit.

# Activity 4 (continued)

Remember the **Caution** from Part 1!

## *Note Well!!*

*The MM Game mechanics enforce restrictions on what creatures can be placed in certain map areas. This is particularly noticeable on overland map areas. These restrictions are somewhat 'relaxed' in dungeon and indoor map areas. The only way to note these restrictions is by trial-and-error. If you add a monster/creature to a map area and the game either doesn't load or exhibits other 'abnormal' behavior when you enter the map area, chances are that you added a 'forbidden' monster-type to that area.*

The 'Bug' that we have discovered (game 'freeze' when attempting to SAVE) is one of the many 'abnormal' behaviors that can be caused by game mechanic 'creature' restrictions. The following pages will provide s 'starting point' to assist you in debugging and correcting this problem.

# Activity 4 (continued)

Change all MONSTER\_ID to known legitimate type.

The screenshot shows the MM8LevelEditor 3.47 interface. The title bar reads "MM8LevelEditor 3.47 -- C:\Program Files\3DO\Might and Magic VII\DATA\GAMES.LOD". The menu bar includes File, View, Display Mode, Extract, Import, Preferences, and About. The left sidebar lists various resource files, with "out01.ddm" selected. The "Import" menu is open, showing options: "Quick-append currently-displayed resource", "currently-displayed resource", "Quick-append selected file", "Selected files", and "All". A text box on the right provides instructions: "Open GAMES.LOD in the MM8LevelEditor. Scroll down and select out01.odm. Select Creatures, scroll down to the Creature table, and scroll to the right until you locate the MONSTER\_TYPE offset (0x60). Replace all four Shape Shifter IDs with type '207'. This Monster Type is the Adventurer, a known legitimate creature-type because the Adventurer is one of the Spawn types identified on MAPSTATS.TXT (file Events.lod). Import currently-displayed resource." Below the text box, a table displays data for the "Creatures" table, with columns for various offsets and their corresponding values.

0x5f	0x60	0x62	0x64	0x66	0x68
PADDING2	MONSTER_TYPE	MONSTER_ATTRIBUTES	SPELL_SKILL_AND_MASTERY_1	SPELL_SKILL_AND_MASTERY_2	SPECIAL_ATTACK
0	207	0	0	0	0
0	207	0	0	0	0
0	207	0	0	0	0
0	207	0	0	0	0
0	151	0	0	0	0
0	152	0	0	0	0

# Activity 4 (continued)

## Verify Changes.

It's now time to verify the file changes.

1. Exit the MM8LevelEditor.
2. Delete the current *GAMES.LOD* file.
3. Rename the *GAMES.LOD.new* file to *GAMES.LOD*.
4. Launch MM7 and Start a New Game.
5. Attempt to SAVE the game. It works!
6. Proceed to the next page to continue your debug session.

# Activity 4 (concluded)

## Make incremental changes to MONSTER\_ID.

We now have a 'working' game that can be successfully SAVED. It is now time to make incremental changes to determine the 'offensive' Creature or Creature 'combination'. The following approach might be helpful.

1. Change the first *Shape Shifter* entry in *out01.odm* (Rathbone) back to '207' (Priest of the Sun).
2. Import changes, rename file, Start a New Game.
3. Attempt to SAVE the new game.
4. If it works, change the next creature entry back to '18' (Priest of the Moon) and repeat steps 2 and 3.
5. Continue this process until you find the 'offending combination'.
6. Correct the 'offending combination' so that each *Shape Shifter* has its own distinct graphic (MONSTER\_ID).

**This concludes the MM7 Modding Guide, Part 2. It might be a good time to begin your list of the *Event Language instructions* and their *arguments*. Part 3 of this guide is a continuation of our work on Emerald Island and will provide guidelines and directions to implement all activities required to complete Rathbone's Quest.**

**Happy modding! BDJ ...**

# Appendix

## CodeSnippets

### **CodeSnippet1**

```
050E0000 046B Mouseover Evt 0x6B  
0B0E0000 0E10 000F01000004 Branch to 4 if Qbit 271  
0D0E0001 39 0A00 000000000010000 Set Group 10 Attribute to Visible  
0D0E0002 39 0900 000000000010000 Set Group 9 Attribute to Visible  
0A0E0003 1210 000F010000 Modify by Setting QBit 271  
080E0004 02 6B000000 Show 2DEvt 0x6B
```

### **CodeSnippet2**

```
083D0200 1E 00030000 Show NPC text 768  
0D3D0201 39 0A00 000000000010001 Set Group 10 Attribute to InVisible  
0C3D0202 28 BF01 00006B000000 Set NPC 0x1BF to 2D location 0x6B  
0D3D0203 27 BF01 000000000000000 Set NPC 0x1BF Topic0 to GloEvt0  
0D3D0204 27 BF01 0000013E020000 Set NPC 0x1BF Topic1 to GloEvt0x23E
```