

CECS 378 Samus Needs a New Suit

I used Fceux and their debugging tools to conduct this lab.

Part 1:

This first screenshot is me testing the hex editor and I had to dig around to find which offset was Samus' actual color palette. I used the PPU viewer to find her hex values and then swapped them out for the purple hues 04 24 and 14 (in black). I switched it up at different byte offsets so that her color will be a different variation at different parts of the game.

By using the PPU Viewer, I determined that Samus' initial colors were 16 1A 27.

Some of the locations I altered containing this string variation of 04 14 24 (in blue) are:

Line 001FB0

Line 016160

Line 0062F0

Line 004910

Line 008910

Line 00A190

Line 001980

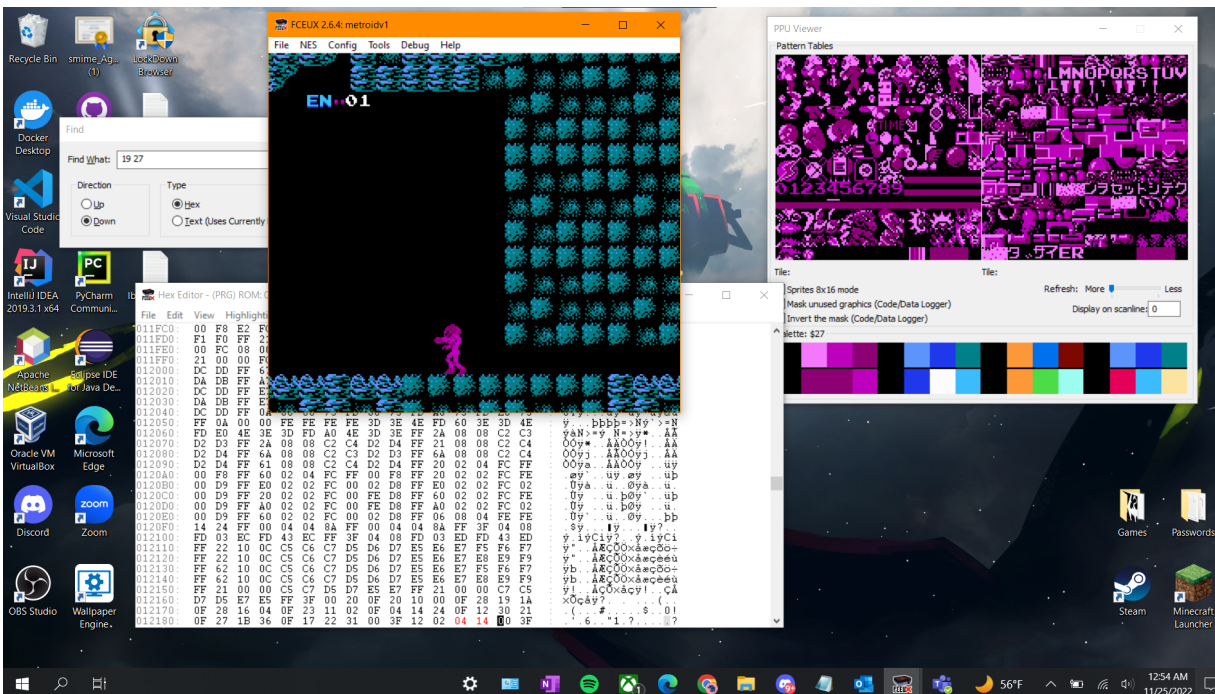
Line 00A170

Line 00C910

```
016150: 07 00 3F 11 03 05 09 17 00 3F 11 03 06 0A 26 00 : 70 H359N0.H36A.0
016160: 3F 11 03 04 24 14 00 3F 00 04 0F 30 30 21 00 3F : H36A.04F.X0.
016170: 10 04 0F 15 34 17 00 3F 10 04 0F 15 34 19 00 3F : G4FL.N0.G4FL.P0.
016180: 10 04 0F 15 34 28 00 3F 10 04 0F 15 34 29 00 3F : G4FL.0.G4FL.0.
```

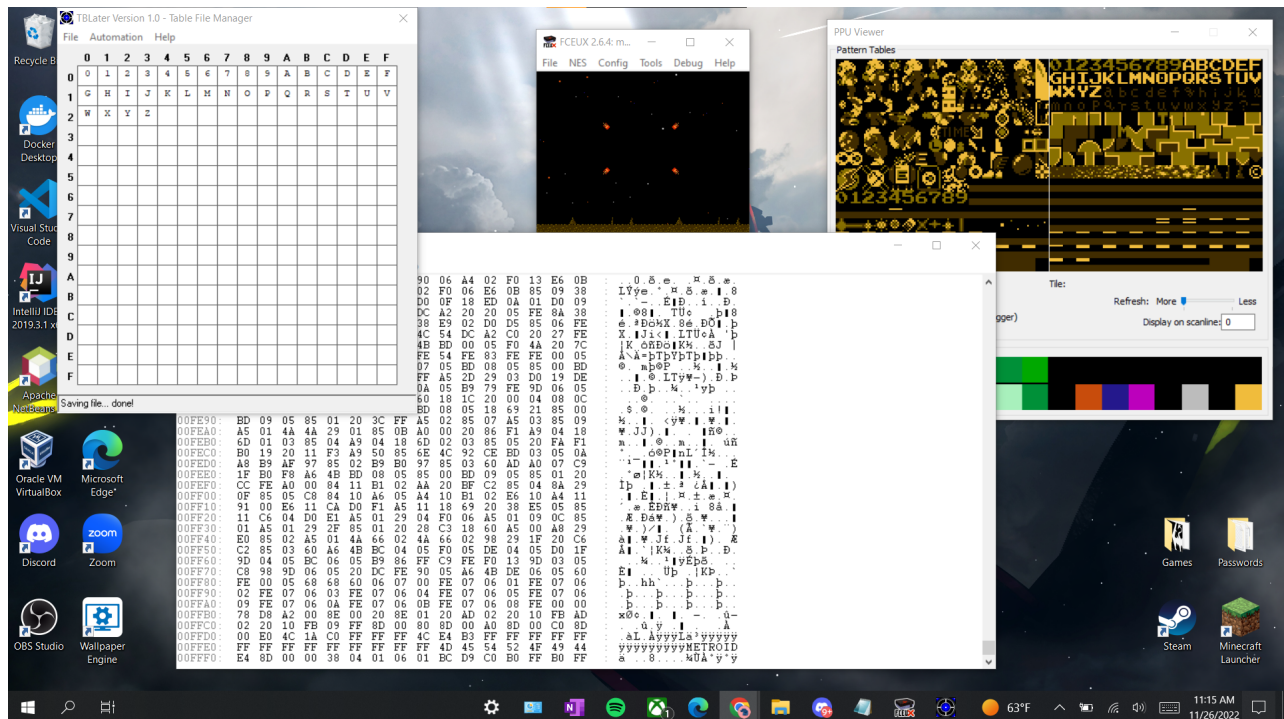


There were additional lines where I altered the original Samus colors with other combinations of the three values 04 24 and 14 throughout the ROM file.



Part 2:

The second portion of the lab was changing the game credits in Metroid. My credits can be seen if you don't press enter/anything and just sit in the Metroid opening screen for it to pop up. I used Fceux's Hex Editor and TBLater to transcribe the original code by labeling numbers and the alphabet and mapping it to a metroid.tbl file. After this I went back into the ROM file, loaded in the .tbl file, and was able to find the in game text for easier editing.



The keyword “Nintendo” was located at byte offset 000530 which used the values 17 12 17 1D 0E 17 0D 18.

The “PUSH START BUTTON” message was located at 000510.

Lines 008660 to line 008710 contained the initial values of the portion I changed:

008660:	8A 8B 8A 8B 8A 8B 8A 8B 24 88 0F 0E 16 0E 1B 10	:	FEMERG
008670:	0E 17 0C 22 FF 18 1B 0D 0E 1B 25 04 1C 0D 0E 0F	:	ENCY. ORDER. 4SDEF
008680:	0E 0A 1D FF 1D 11 0E FF 16 0E 1D 1B 18 12 0D FF	:	EAT. THE. METROID.
008690:	18 0F FF FF FF FF FF FF 25 44 1A 1D 11 0E FF	:	OF. QTHE.
0086A0:	19 15 0A 17 0E 1D FF 23 0E 0B 0E 1D 11 FF 0A 17	:	PLANET. ZEBETH. AN
0086B0:	0D FF FF FF FF FF FF 25 84 1A 0D 0E 1C 1D 1B 22	:	D. QDESTROY
0086C0:	FF 1D 11 0E FF 16 18 1D 11 0E 1B FF 0B 1B 0A 12	:	THE. MOTHER. BRAI
0086D0:	17 FF FF 25 C4 1A 1D 11 0E FF 16 0E 0C 11 0A 17	:	N. QTHE. MECHAN
0086E0:	12 0C 0A 15 FF 15 12 0F 0E FF 1F 0E 12 17 FF FF	:	ICAL. LIFE. VEIN.
0086F0:	26 27 15 10 0A 15 0A 21 22 FF 0F 0E 0D 0E 1B 0A	:	. . . LGALAXY. FEDERA
008700:	15 FF 19 18 15 12 0C 0E 26 69 12 FF FF FF FF FF	:	L. POLICE. I.
008710:	FF FF FF FF FF FF FF FF 16 05 01 00 00 46 FF	: M5100..

“EMERGENCY” used the values 0E 16 0E 1B 10 0E 17 0C 22 and there were additional values around it for screen placement (ex. FF).



Note: After I began testing new hex values, my location numbers changed to 000670 as seen below:

[illegible]

The next message was on line 000670 which starts with "FEMERGENCY.ORDER" and this will be what I am changing from the above lines:

[illegible]

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I inserted my name at Line 000710. I had issues with the formatting which I will include below as I wanted to ensure that I would fit the new text into the original amount of allocated spaces Metroid had. I also switched up the game intro at these lines.

```
000660: 8A 8B 8A 8B 8A 8B 8A 8B 8A 8B 8A 8B 8A 8B 8A 8B : .....FEMERG
000670: 8A 8B 8A 8B 8A 8B 8A 8B 24 88 0F 0E 16 0E 1B 10 : ENCY ORDER 4SI A
000680: 0E 17 0C 22 FF 18 1B 0D 0E 1B 25 04 1C 12 FF 0A : M DOING THIS MIS
000690: 16 FF 0D 18 12 17 10 FF 1D 11 12 1C FF 16 12 1C : SION.....QTO..
0006A0: 1C 12 18 17 FF FF FF FF FF 25 44 1A 1D 18 FF FF : BRING..AID TO TH
0006B0: 0B 1B 12 17 10 FF FF 0A 12 0D FF 1D 18 FF 1D 11 : E.....QSMASH..
0006C0: 0E FF FF FF FF FF 25 84 1A 1C 16 0A 1C 11 FF FF : THE SMASH BROS..
0006D0: FF 1D 11 0E FF 1C 16 0A 1C 11 FF 0B 1B 18 1C FF : ..THE FRANCH
0006E0: FF FF FF 25 C4 1A 1D 11 0E FF 0F 1B 0A 17 0C 11 : ISE..RIP ETIKA..
0006F0: 12 1C 0E FF FF 1B 12 19 FF 0E 1D 12 14 0A 5F FF : ..LCHELSEA AGUIL
000700: 26 27 15 0C 11 0E 15 1C 0E 0A FF 0A 10 1E 12 15 : AR HUNTR..I.....
000710: 0A 1B FF 11 1E 17 1D 1B 26 69 12 FF FF FF FF FF : .....M1900..
000720: FF FF FF FF FF FF FF FF FF 16 01 09 00 00 46 FF : .....
```



Anything else you want to tell me:

There was a bit of digging around to find out what I changed from the original Metroid ROM file during testing. There would be instances where I would work in the lab at different times and I would attempt to edit the file but nothing would happen so I had to reset the ROM or compare the original ROM to my current version. One weird issue I had was during the new insertion of text, formatting had to be a bit precise because switching/removing a piece of code from lines 000670 to 000730 gave me a column that

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would follow from the loading screen to other sections of the map as seen below.

Overall I liked this lab and it was interesting to do it, since this isn't something I probably would have done in my spare time.

