


Programming Lab 6F

Lisa Simpson Dancing

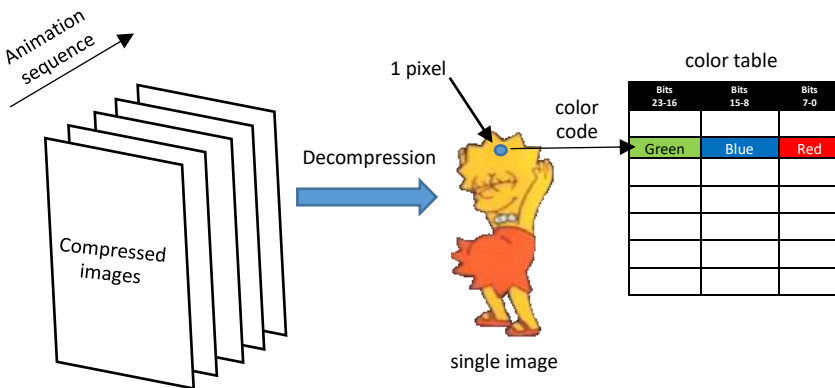
Topics: One-dimensional subscripting, post-indexed addressing and loops

 Click to download Lab6F-Main.c

Prerequisite Reading: Chapters 1-6

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Background¹: An animation may be stored as a sequence of compressed images in a GIF file. Once decompressed, each image consists of a sequence of color codes, corresponding to pixels from the top-left to the bottom-right of the image. Each code is used to subscript into a color table (or palette) that defines the red, blue and green components of the color. To produce the animation, the images are decompressed and displayed with some delay between successive images. The animation speed can be controlled by varying the delay. A continuous animation simply restarts the sequence after the last image has been displayed.



Assignment: The main program will compile and run without writing any assembly. However, your task is to create an equivalent replacement in assembly language for function `PaintLine` found in the C main program. The original C version has been defined as “weak” so that the linker will automatically replace it in the executable image by the one you create in assembly; you do not need to remove the C version.

```
void PaintLine(uint32_t row, uint32_t cols, uint8_t *pColors, uint8_t *pPalette) ;
```

- `row` The number of the row to be painted. Row 0 is the top row.
- `cols` The width of the image (and row) measured in pixels.
- `pColors` A pointer to a one-dimensional table of color indices, one per pixel. Each entry in the table is 8 bits (1 byte) wide, and is used as a subscript into the color table (see below).
- `pPalette` A pointer to the first byte of a one-dimensional color table. Each entry in the table is a sequence of three bytes. The first byte represents the red component of the color, the second represents the green component, and the third represents the blue component.

Test your implementation of the `PaintLine` function using the C main program. If your code is correct, the display should display Lisa Simpson dancing as in the image above. Errors will be displayed as **white text on a red background**. Use the blue pushbutton to pause and the slider to change the speed.

¹ <https://en.wikipedia.org/wiki/GIF>