```
    1: // pixels.cpp:
    2: // using SFML to load a file, manipulate its pixels, write it to disk
    3: // Fred Martin, fredm@cs.uml.edu, Sun Mar  2 15:57:08 2014
    4:
    5: // g++ -o pixels pixels.cpp -lsfml-graphics -lsfml-window
    6:
    7: #include <SFML/System.hpp>
    8: #include <SFML/Window.hpp>
    9: #include <SFML/Graphics.hpp>
   10: #include "LFSR.hpp"
   11:
   12:
   13: int main(int argc, char* argv[])
   14: {
   15:         string input_file = argv[1];
   16:         string output_file = argv[2];
   17:         string seed = argv[3];
   18:         int tap = atoi(argv[4]);
   19:
   20:         sf::Image first;
   21:         if (!first.loadFromFile(input_file))
   22:                 return -1;
   23:
   24:         sf::Image second;
   25:         if (!second.loadFromFile(input_file))
   26:                 return -1;
   27:
   28:         // p is a pixel
   29:         sf::Color p;
   30:         sf::Vector2u win1_size = first.getSize();
   31:
   32:         LFSR lfsr(seed, tap);
   33:
   34:         // create encrypted image of the original image
   35:         for (unsigned int x = 0; x < win1_size.x; x++) {
   36:                 for (unsigned int y = 0; y < win1_size.y; y++) {
   37:                         p = second.getPixel(x, y);
   38:                         p.r = p.r ^ lfsr.generate(5);
   39:                         p.g = p.g ^ lfsr.generate(5);
   40:                         p.b = p.b ^ lfsr.generate(5);
   41:                         second.setPixel(x, y, p);
   42:                 }
   43:         }
   44:
   45:         sf::RenderWindow window1(sf::VideoMode(win1_size.x, win1_size.y), "F
irst");
   46:         sf::RenderWindow window2(sf::VideoMode(win1_size.x, win1_size.y), "S
econd");
   47:
   48:         sf::Texture original;
   49:         original.loadFromImage(first);
   50:         sf::Texture encrypted;
   51:         encrypted.loadFromImage(second);
   52:
   53:         sf::Sprite sprite1;
   54:         sprite1.setTexture(original);
   55:         sf::Sprite sprite2;
   56:         sprite2.setTexture(encrypted);
   57:
   58:         while (window1.isOpen() && window2.isOpen()) {
   59:         sf::Event event;
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   60:                   while (window1.pollEvent(event)) {
   61:                           if (event.type == sf::Event::Closed)
   62:                                   window1.close();
   63:                           else if (sf::Keyboard::isKeyPressed(sf::Keyboard::Es
cape))
   64:                                   window1.close();
   65:                   }
   66:                   while (window2.pollEvent(event)) {
   67:                           if (event.type == sf::Event::Closed)
   68:                                   window2.close();
   69:                           else if (sf::Keyboard::isKeyPressed(sf::Keyboard::Es
cape))
   70:                                   window2.close();
   71:                           }
   72:                   window1.clear();
   73:                   window1.draw(sprite1);
   74:                   window1.display();
   75:                   window2.clear();
   76:                   window2.draw(sprite2);
   77:                   window2.display();
   78:           }
   79:
   80:           // fredm: saving a PNG segfaults for me, though it does properly
   81:           //   write the file
   82:           if (!second.saveToFile(output_file))
   83:                   return -1;
   84:
   85:           return 0;
   86: }
```