

San Francisco Chronicle

Insight

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Sunday, November 15, 2015 | SAN FRANCISCO CHRONICLE AND SFCHRONICLE.COM | Insight E5

NATION

TECHNOLOGY

Music and programming — creative performances

By John Boggs

What do Google Search and Taylor Swift's hit single "Blank Space" have in common? This isn't a joke — but the fact that it sounds like one illustrates a cultural misunderstanding of software and modern music.

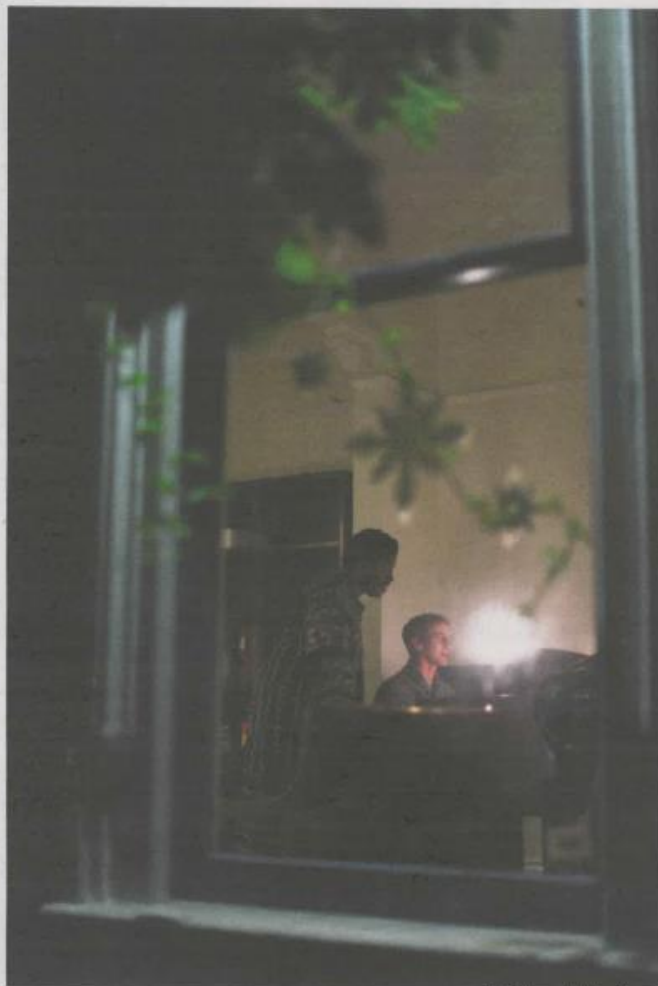
In the 1970s, when the computer industry started growing, many companies hired musicians to train as programmers. They believed that candidates with training and aptitude in music would learn programming more quickly. Music is still well represented in programming culture. Growing software companies often dedicate a band room before establishing something more universal like a gym or a day care center.

Talented programmers are called "rock stars," and a surprising number of programmers have studied music or are amateur musicians. Personally, I'm in two musical groups with co-workers at Twitter. Even programmers who don't play often listen to music while they work to help them focus.

The connection between music and programming works in the other direction, too. While writing this, I skimmed Spotify's "U.S. Top 50" playlist. In 40 of the 50 songs, I could hear digitally sequenced instrumentation. Sequenced parts are performed in software: The music is created on a computer and written directly to audio files without an intermediary step of amplification and recording. It feels fair to me to say that sequenced music *is* software.

Those who study music learn patterns: arpeggios, cadences, the blues form, etc. Then they create something larger using those patterns, often visualizing the work through music notation.

Programming is similar, except the patterns are things like "arrays" and "callbacks," and the notation is code. There is no procedure for writing a sonata or a search engine: It's a creative process that leverages exploration and experimentation. Both subjects have



Scott Strazanie / The Chronicle

John Boggs, a computer engineer at Twitter, at his music lesson with Brian Curtis at the San Francisco Community Music Center.

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some theory, but what makes a great musician or programmer is largely good abstract reasoning and intuition for their field. Those skills are developed through practice more than study, and good music and computer science educators will tell you: "You have to do it before you'll understand it."

Comparing the skills necessary for music and programming illustrates the fact that music education provides more value than simply entertainment. Music requires abstract thinking, creativity and diligence. Learning and practicing music are pleasurable and approachable ways to develop those skills. Music is something kids can relate to and enjoy. Computer science is harder to appreciate.

I grew up playing music, and I continue to explore it at the San Francisco Community Music Center in the Mission District, where students of all ages and financial means study together. Time will tell whether those students will choose to perform as professional musicians or as creative professionals.

As the global economy continues to rely more on computers and technology, the skills necessary to work with — and reason about — software become more important. I look forward to teaching my children those skills, in part through music. Playing music with friends and family is a joyous and nurturing activity that has great value for personal development.

Maybe there's more to having Swift's latest hit track stuck in your head than you think.

John Boggs is a software engineer at Twitter and a student at Community Music Center. To comment, submit your letter to the editor at www.sfgate.com/submissions.

Digital performance

To listen to a sample of John Boggs' music, go to <http://sfchron.cl/1Qtosom>. He wrote, played and recorded "Ice Flats."