

If _____ , You Might Be a Computational Thinker!

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SUMMARY

Computational Thinking (CT) has been articulated as a “fundamental skill for everyone, not just for computer scientists” [10]. Almost all agree with the lofty goals of the initiative, to teach humanity the ability to see the world through the sharpened eyes of a computer scientist. Others have shared their vision of what CT is, how to pave the way [7], weave it into a curriculum [1, 2, 9], and what the effects might be [8]. However, what does it *really* mean to be a computational thinker? While it is helpful to see examples that show we’re already engaged in CT (e.g., using a backpack is pre-fetching and caching), it is perhaps more valuable to see everyday situations that are *transformed* when viewed through a computational thinker’s trained eyes (e.g., writing dates as YYYY-MM-DD so they’ll sort correctly). We hope to present enough examples to satisfy a growing chorus of those who need more grounding, using a unique delivery format.

Jeff Foxworthy is a popular and successful stand-up comedian, especially in rural areas of the southern United States [5]. His signature bit is to find subtle aspects of life that are common to “rednecks”, a term used to describe “uneducated white farm laborers” (whose neck is red from sunburn) [3]. These observations are never meant to be mean-spirited, are told with acute comic timing, and audiences love them. Here are some of his best [4], using his template:

“If _____, you might be a redneck!”

...you think the last words to the Star Spangled Banner are ‘Gentlemen, start your engines’...

...you get stopped by a state trooper, and when he asks you if you have an I.D. and you say, ‘Bout what?’...

...you carried a fishing pole into Sea World...

We will use a similar template and each of the four “stand up computational thinkers” will riff on observations of life as seen through CT eyes. We hope to provide enough examples that the (mostly CT) audience will feel compelled to join us in an “open mike” format and share their experiences. Whenever possible, we will channel Mr. Foxworthy and aim for the funny bone.

Categories and Subject Descriptors

K.3.2 [Computer and Information Science Education]: Computer Science Education

General Terms

Algorithms, Management, Measurement, Documentation, Performance, Design, Economics, Reliability, Experimentation, Security, Human Factors, Standardization, Languages, Theory, Legal Aspects, Verification.

Keywords

Computational Thinking, stand-up comedy, Jeff Foxworthy

1. OBJECTIVE

This special session has a singular objective: to provide contextualization through examples to support the growing CT movement. All the situations presented by the speakers as well as the audience contributions will be compiled and made publicly available through a wiki. This allows for a wealth of material to share with others (including/especially the general public) to explain the benefits of CT, perhaps even uncover a few budding computer scientists. The session will be organized as a topic-driven, open mike, stand-up comedy experience.

2. OUTLINE

In the spirit of CT, here is the outline, in pseudo-code:

(Before the conference...) Collect the union of all the CT topics for all the examples from all the presenters into a topic pool (e.g., “Boolean Logic”, “Testing and Debugging”, “Concurrency”, etc.)

Begin the session with the moderator explaining the session and format, emphasizing the importance of audience participation throughout (5 min).

All four stand-up computational thinkers ascend the stage; open mikes are made available to the audience.

Repeat until 75 minutes are up:

- Remove an un-chosen topic from the topic pool and display it on the screen for all to see
- All presenters who have ideas for this topic take turns, share their example, with opportunities for the other three to riff on what was just said.
- Audience members are free to contribute / comment at any time

Here are three samples from each presenter with the CT topic in parentheses. Each should be placed into the modified template:

“If _____, you might be a computational thinker!”

2.1 Daniel D. Garcia

...in order to guarantee you'll be woken up for the next day's SIGCSE keynote by your hotel alarm clock, you set it to one minute more than the current time, *test* to see if the volume is ok, and then *change one thing* – the alarm time... (testing, debugging)

...in response to a gleeful "*Trick or Treat!*" from neighborhood ghouls and goblins, you hand out some candy then hope that they meant *exclusive* or and not *inclusive* or... (Boolean logic)

...you're working with three outstanding educators to submit a proposal for a special session entitled "If _____, you might be a computational thinker" and you use a Google Docs [6] live shared document instead of sending copies of a Word file around and worrying about who has write lock... (recursion, concurrency, single source of truth)

2.2 John P. Dougherty

...you do not *stack* your clean dishes or clothes, you *queue* them; (on a related note, you understand why inspired supermarket milk fridges have open backs so they can load milk from the *back* of the fridge not the front ... and also why you should reach to the *farthest back* of a column of milks to get the freshest carton)... (stacks vs. queues)

...you applauded during *Jurassic Park* when the girl uttered the line "*It's a UNIX system! I know this!*", then you groaned because you realized it was actually *IRIX*... (pop culture, UNIX)

...you realize that Three Dog Night had it wrong; *One* is not the loneliest number, *Zero* is... (integer representation)

2.3 Matthew C. Jadud

...you rooted for the computer in *War Games*... (pop culture, AI)

...you've ever caused everyone's dinner to get cold while you explain the glories of the *Dining Philosophers* problem using a friend's chop stick, and then discovered that most philosophers like their take-out warm, thank-you-very-much... (concurrency)

...you look at an onion and weep ... because it has no base case... (recursion)

2.4 Colleen M. Lewis

...you call someone and you get their roommate because they're not home, and instead of saying you'll call *them* back in an hour, you ask them to call *you* back... (polling vs. interrupts)

...you think that the joke "*There are 10 kinds of people in the world, those who understand binary numbers and those who don't.*" is funny... (binary numbers)

...you think you have a way to beat the house in Blackjack, so you write a simulator to stress-test it... (simulation, probability)

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3. EXPECTATIONS

The intended audience for the special session is the broad community of computing educators, including those who have and have not joined the CT campaign. They will hear (and hopefully, contribute) many varied situations of what computational thinkers do in real life, and should take away concrete, grounded examples of how CT could positively affect the lives, behavior and perceptions of everyday people.

4. SUITABILITY

Our format involves all four presenters on stage at once, one-upping each other with their prepared and ad libbed examples, with audience contributions through an open mike. A special session affords and encourages this unique format with the most audience involvement.

5. REFERENCES

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