VISUALIZING CREATIVE CODE: PRINCIPLES FOR UNDERSTANDING ESOTERIC PROGRAMMING LANGUAGES

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ABSTRACT

This research project examines esoteric, or "weird" programming languages—a class of languages not created for any "real world" use but instead for play, competition, proof of concept, or art. We have developed strategies for representing how a wide variety of these programming languages work, circulate, and make meaning for a non-specialist, non-technical audience. Through a multidisciplinary approach in which we gathered scholarship from the fields of writing studies, digital rhetoric, computer science, and graphic design, we have found three principles that apply to visualizing code, which emphasize the effectiveness of: (1) technical communication, (2) tables for stack-based languages, and (3) function over form. We then consider how our findings can be used to help others understand code and become code-literate.

RESEARCH QUESTION

What strategies are useful for representing how a wide variety of **esoteric programming languages** work, circulate, and make meaning to a non-specialist audience? What can we learn from such visualizations?

THESIS

Esoteric programming languages can be visualized and understood by to a non-specialist audience by using techniques from **technical communication** and by focusing on function, rather than form.

METHODOLOGY

Composed of two phases, our methodology involved bringing together scholarship and approaches from writing studies, digital rhetoric, and graphic design.

Phase 1:

- Begin surveying current approaches in technical communication
- Conduct research on creative programming languages, including histories, circulation, and function

Phase 2:

- Create visual guides to show how various esoteric programming langauges function based on **"Hello, World!" programs**
- Apply the **Design Process** and the elements and principles of design to visualize programming languages.

RESULTS & CONCLUSIONS

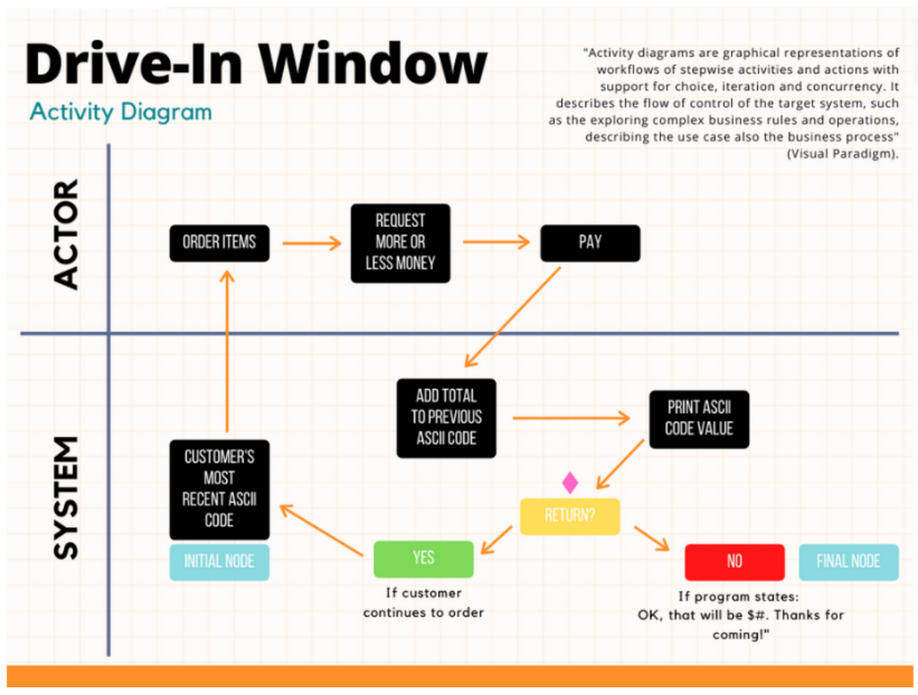
Visualizing creative code is helpful for understanding programming languages, particularly for a non-specialist audience, because it reveals how the code functions outside of its form as a **low-level programming language**. Our research found three principles that are useful to consider when visualizing code:

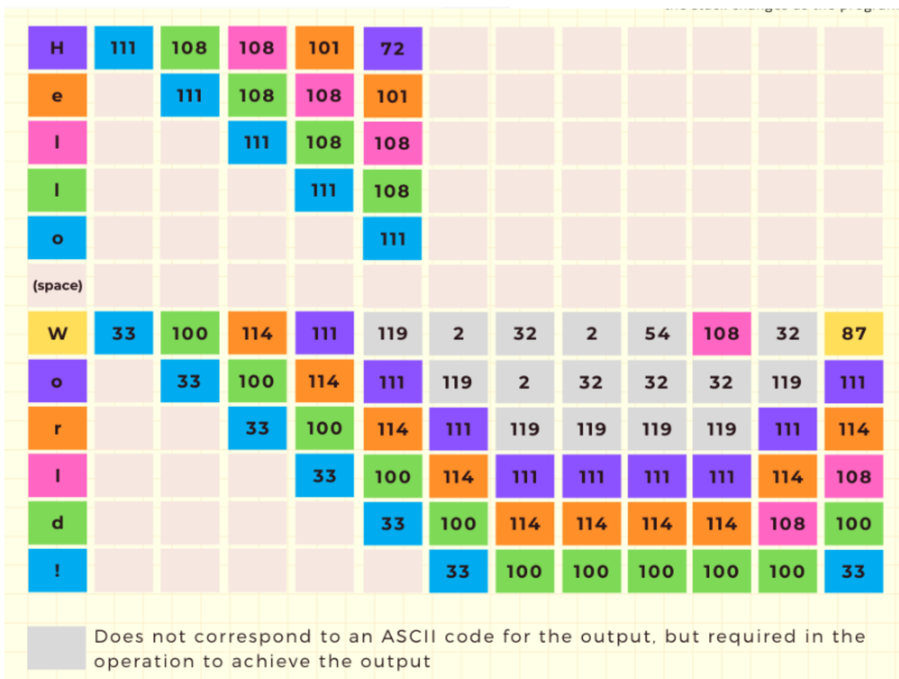
1. Strategies from technical communication are consistently effective in demonstrating the function of code. The most useful visualizations include Sequence Diagrams and Activity Diagrams.

2. Coding languages can be understood through function via "commands." This approach only considers the form of the programming language.

3. Tables that contained visual cues of a sequence were most effective in visualizing stack-based languages.

Activity diagram for Drive-In Window demonstrates the application of technical communication techniques to coding languages.





H	111	108	108	101	72							
e		111	108	108	101							
l			111	108	108							
l				111	108							
o					111							
(space)												
W	33	100	114	111	119	2	32	2	54	108	32	87
o		33	100	114	111	119	2	32	32	32	119	111
r			33	100	114	111	119	119	119	119	111	114
l				33	100	114	111	111	111	111	114	108
d					33	100	114	114	114	114	108	100
!						33	100	100	100	100	100	33

Does not correspond to an ASCII code for the output, but required in the operation to achieve the output

"Hello, World!" in the programming language "Chef" in a stack table that is organized sequentially and read from the bottom right to the top left.

FUTURE IMPLICATIONS

These findings reveal that there are:

1. Intersections between the principles and elements of design and coding
2. Non-traditional means available to allow a vast majority of people to understand programming languages

As a result, through visualizing code, we can consider what it means to be code-literate and how the definition of **literacy** is changing to adapt to the presence of coding.