



Making It to Break It

The design of Double Fine's *Hack 'n' Slash*

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Project Lead

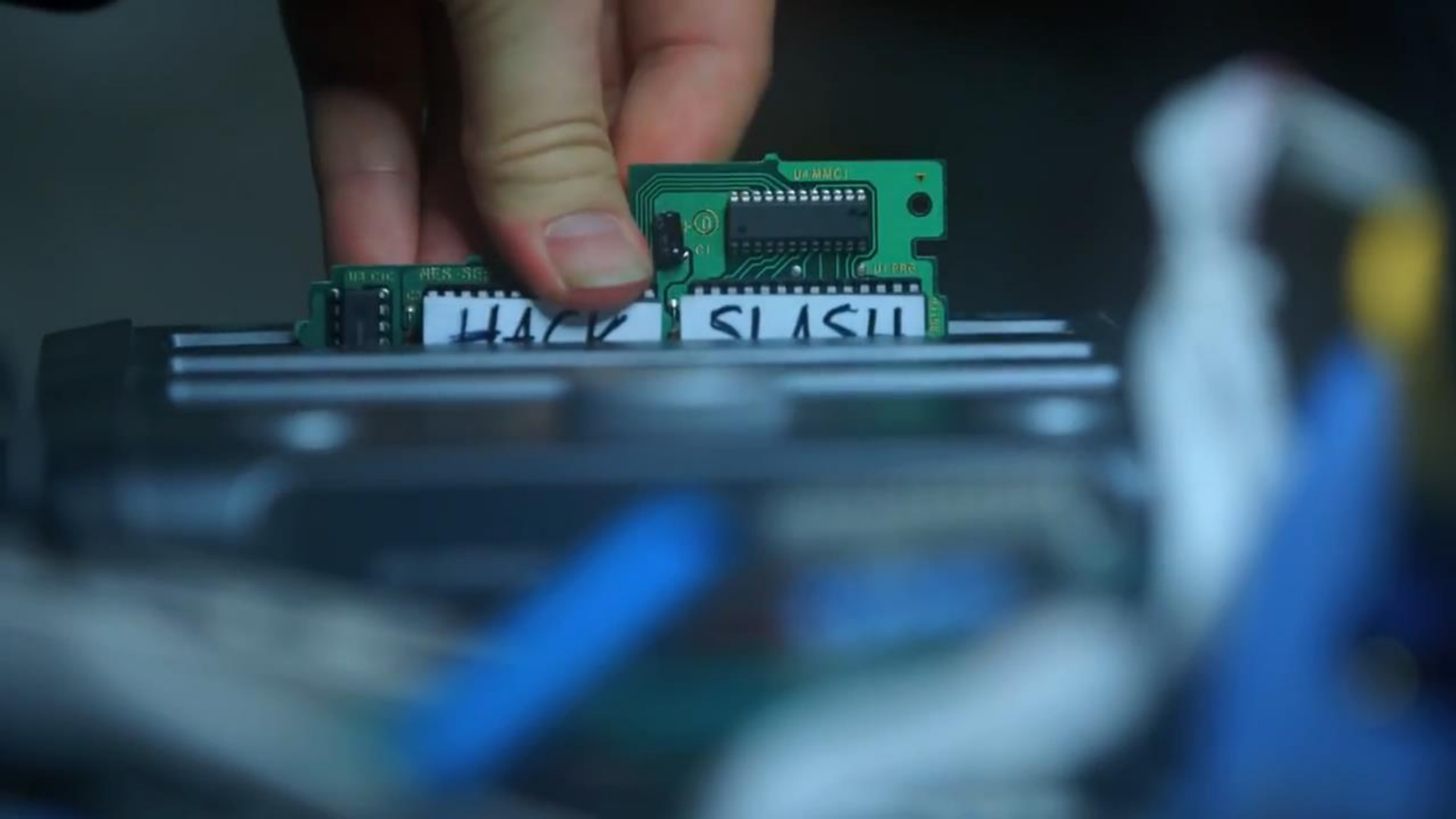
GAME DEVELOPERS CONFERENCE®

MOSCONE CENTER · SAN FRANCISCO, CA

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▶ HACK N SLASH

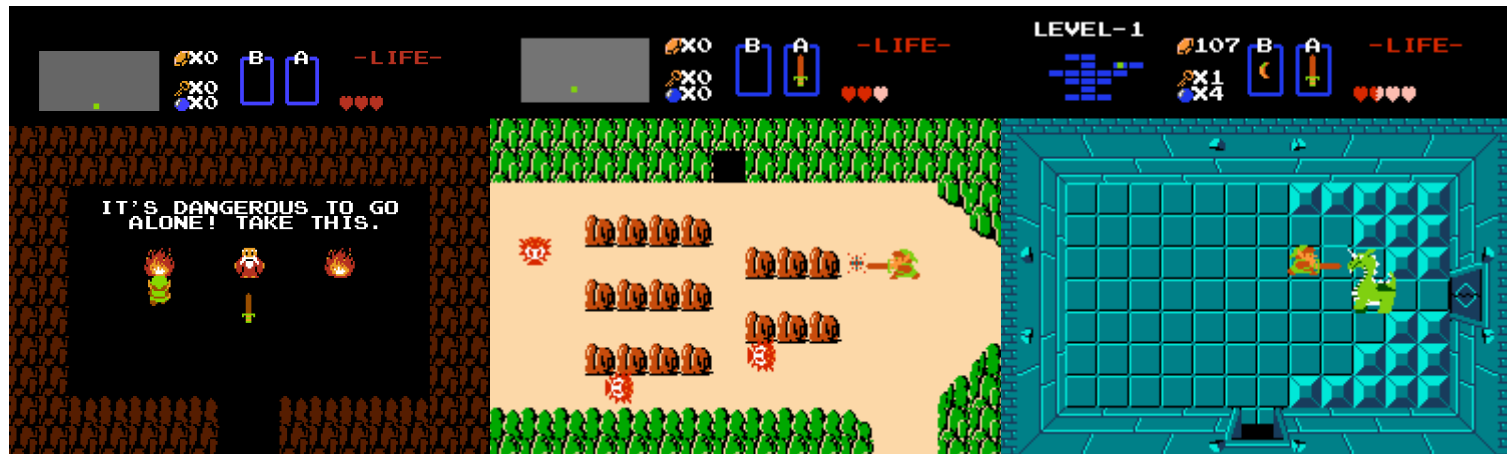






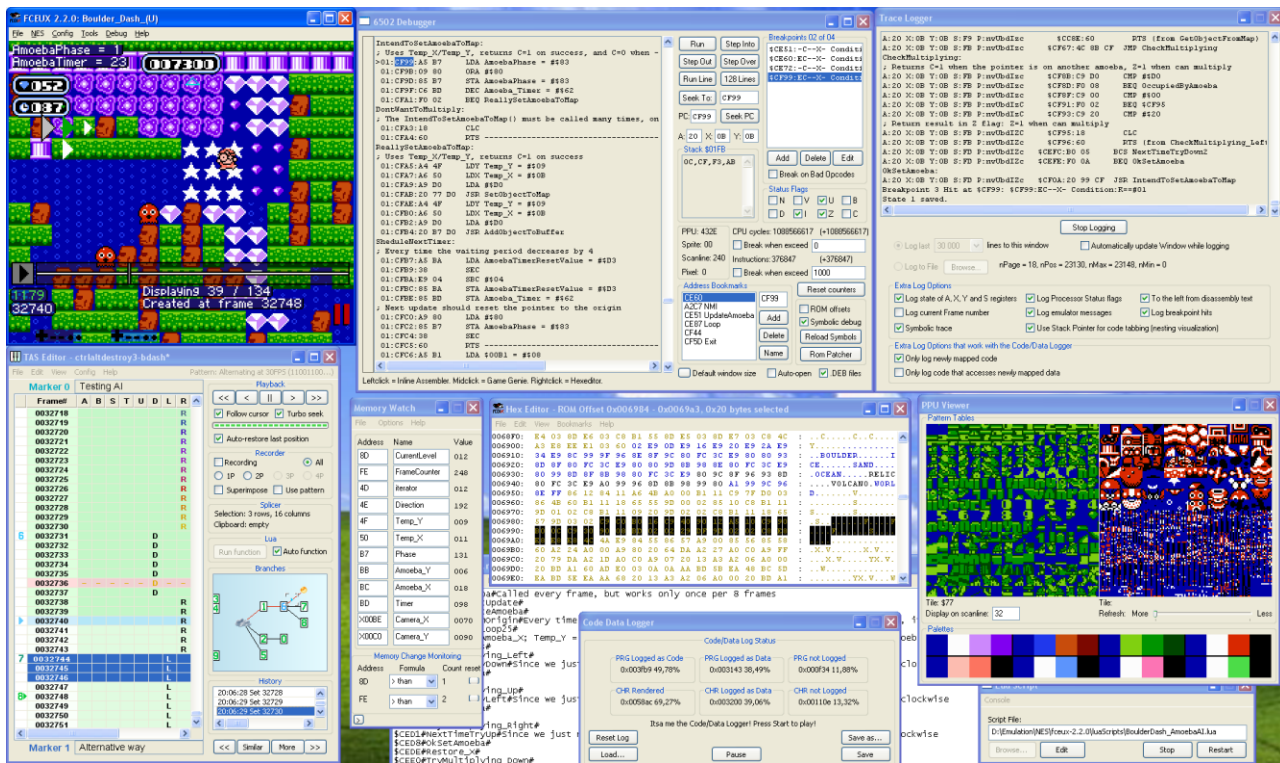
Inspired by classic action-adventures

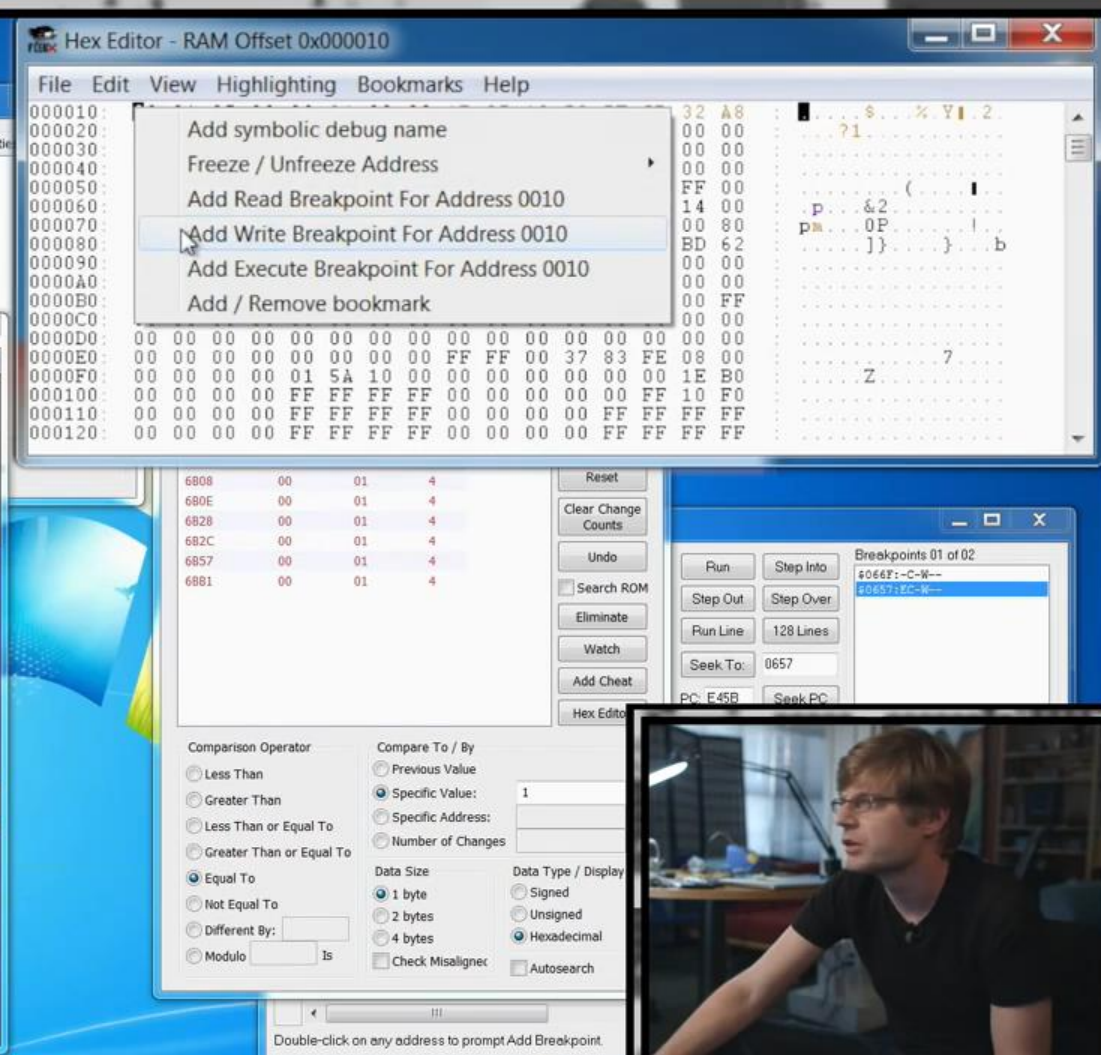
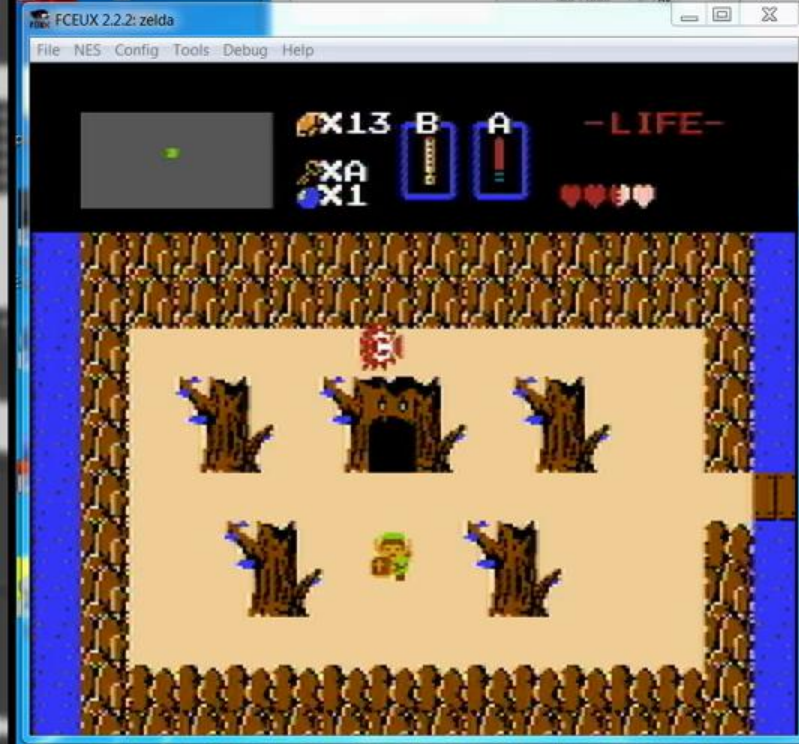
- Perhaps one in particular





Also inspired by classic emulators







Hack `n` Slash mechanics

SpikeyTurtle 1

ESC

CHARGE_DISTANCE 400
CHARGE_SPEED 300
DAMAGE 1
EXPLODE_ON_CHARGE_HIT false
FACTION
FIELD_OF_VIEW
FLIPPED_OVER_S
HEALTH
HEARTS_TO_DROP
IDLE_BEHAVIOR
MOVE_SPEED
PERCEPTION_DIST

IDLE_BEHAVIOR

1 TURN
2 IDLE
3 [IDLE]
4 MOVE

[create new item]

DIRECTION

X

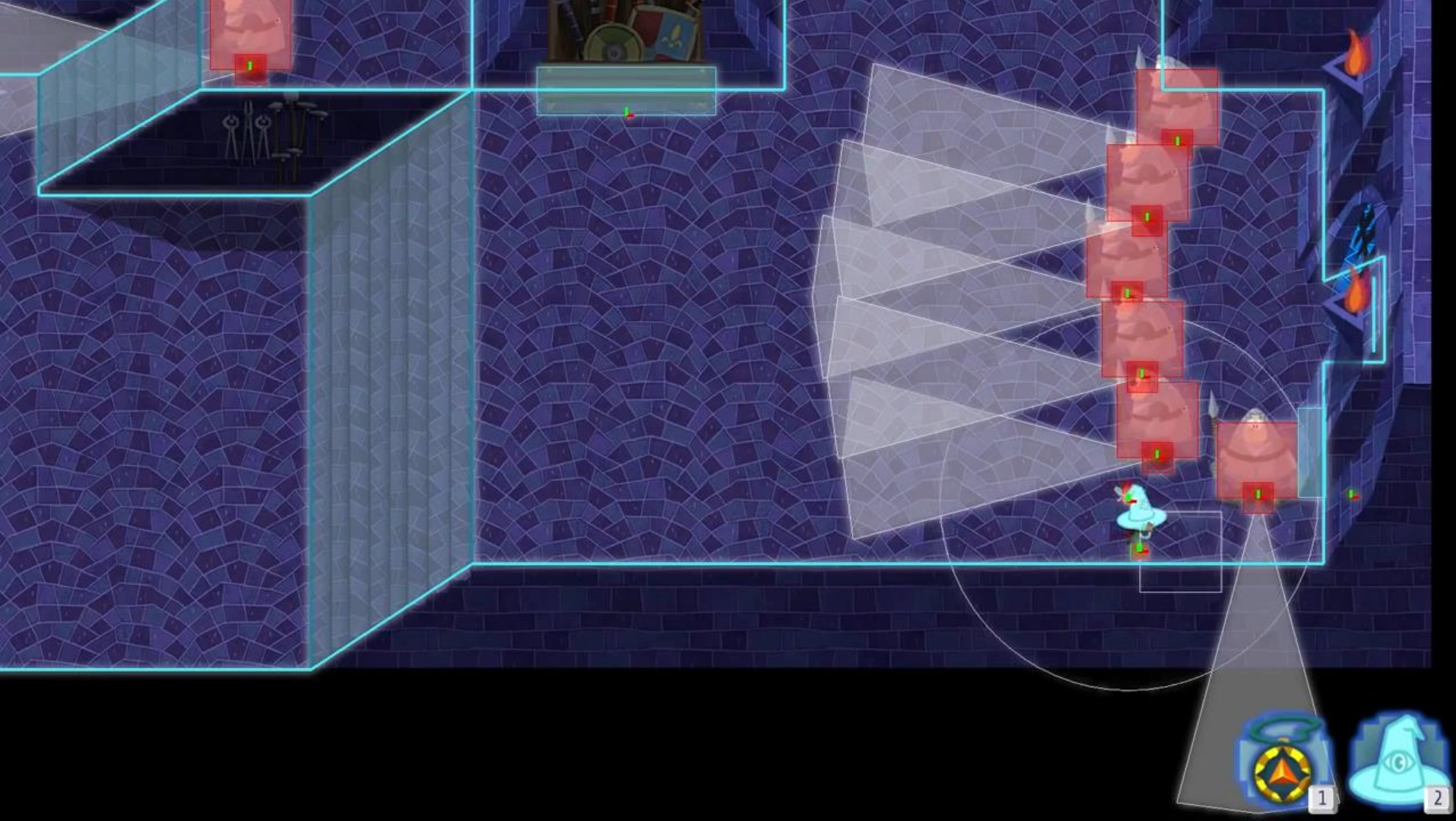
random

move delete
move delete
move delete
move delete

ESC

SPACE

1





createBridgeFunction



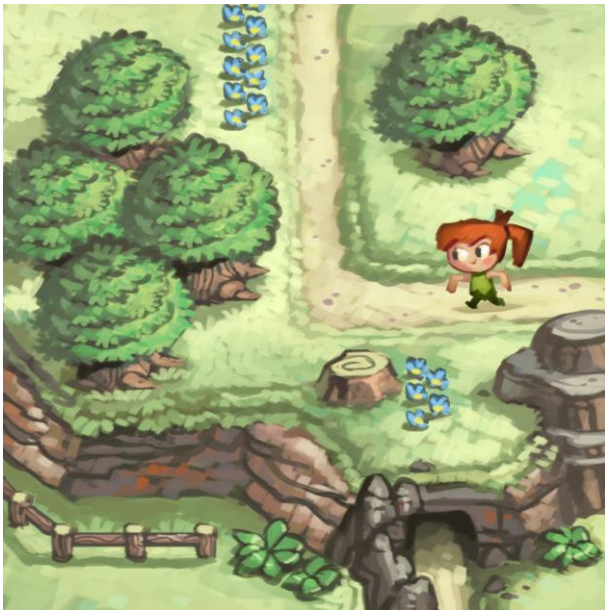


Design principles



Leverage hacking as a mechanic

- (not as an aesthetic)





Keep hacking mechanics legitimate

- When you hack in the game, you hack in real life.





How do you design to these principles?

- Looks like a classic game, but doesn't act like one.
- Leverages hacking concepts that are obscure even to most programmers.
- Exposes players to the vagaries of the raw code.
- A bullet point list to make game designers itch.



How do people learn to hack?

- Many (most?) hackers are self-taught.
- But “self-taught” is a misleading term.
- Most learn from information freely shared by hackers that preceded them.



Early internet hacking resources

Fravia's
archive
pages of
reverse
engineering

Fravia's Archive
The Web

Software reverse engineering and web survival arguments

Software protection techniques and tools

Assembly on the Web: cracking, memory tracking and other techniques

Really cracking and anti-disassembly techniques and tools

How to search the web: crawling, linking and other strategies

cookies, network, host and web-spider trapping, anti-Microsoft and anti-Netscape scripts and tricks, tools for software reverse engineering, api-cracking, user self-defense, corporate survival counter-measures, home-pages exposing and password-cracking techniques, commercial mail client busting, Java applets reversing, val monitoring, imageographical and cryptological reversing matters, Javascript based site protection and deprotection techniques, email password reversing

On the Web since 1995!

If you have landed here for the first time, or if you are interested in the history of this site, visit [this page](#) to be informed soon before proceeding.

My reader, the thousands of pages (you'll never be able to count them all...) contain many teachings, and will help you gain knowledge that you will not find elsewhere. Please wander slowly inside, say a good Hello to a nice Twinkler, [Fravia](#) takes your time and explores at a leisurely pace. I will find reasons on how to reverse engineer windows, dos, linux and pulsing programs, hell is easier to penetrate in its depths than I realize; every day, you see how it, on how to crack the Web using the most techniques like [crawling](#) and [linking](#) (just as easy); on how to gain real information (pretty difficult), on how to track pseudonymous people in the web (fairly difficult), on how to protect your anonymity browsing the Web (quite difficult), on how to reverse the safety around you (very difficult), on how to destroy web sites you do not like (easy, given some conditions), on how to use (and abuse!) imageographical encryption, on how to reverse or implement [javascript](#) based site protection, on how to answer questions, reverse web-spider, spy bots, write your own spiders and much more. I hope you'll enjoy this visit. Your critics and suggestions are welcome.

Fravia

Disclaimer of liability

I do declare that, Oh Luck!

All information on my site is published for educational purposes only. You may reverse engineer, debug or crack only applications or programs you have legitimately bought, and only for your personal use. You may browse or make only sites and pages that are really funny and/or politically commented-related. :-)

Read my short essay: [Is reverse engineering a crime?](#)

Special disclaimer

About the part of my site dealing with reversing protection schemes:

Please note that I have always been a very sensible person; if any programmer with a legitimate interest really finds that any source published on my site should be removed and put in a non-public part of the fortress, I usually will comply with a legitimate interest [with a legitimate interest](#).

Yet this will hurt the protection, not the source-cracker out there. "secrecy" is an inherent pollution with water and social matters that I myself do NOT make any sense. I believe in the contrary: maximum transparency to be a very important WEAPON for all software developers and for all protection and Fravia alike. My site is a forum where anyone can have ROOT software "tools". WHY commercial protection do not work and why there are much better things to do with our knowledge than releasing tons of cracks and worse to the lazzies of the world. In fact I believe that you will have lots of [nothing](#) here to protect better your programs.

Good browsers and bad browsers

Which browser are you using, my good reader?

I advise those of you still using Netscape (it's even worse MSIE) to download and use from now on [Firefox](#), an extremely lighter, configurable, powerful, easy to use new item (less than a million bytes) browser that will let you forget once the all both overbloaded browsers and their terrible bugs. Of course you are allowed to use [Microsoft](#) in any way you do, take care the best version is 5.0 for good old and solid version 3, not the overbloaded and buggy versions 4, 4.5 & 7).

Now, please try to understand: you may NOT use Microsoft's rule in any way (I think of some pages just "play" security, since are seriously MSIE hostile, so don't complain you have not been warned! :-)

Entrances to Fravia's fortress

If your browser is poor click on the red. If your browser is poor click on the red. If your browser is [good](#) click on the red.

N.B. The [main landing](#) is at the moment NOT being updated.

24 February 11:55
[Read the news!](#)

Fravia's past updates

researches at Fravia's

ABC



University security courses

Buffer Overflow Project (75 points + 25 bonus points)

Objective

The objective of this project is to give you hands-on experience with implementing buffer overflow exploits. You are given source code for five exploitable programs (`target1.c`, ..., `target5.c`). These programs are all installed as `setuid root` in the the VMware virtual machine. Your goal is to write five exploit programs (`spl0it1`, ..., `spl0it5`). The `spl0it[i]` program will execute `target[i]`, giving it a certain input that should result in a root shell on the VMware virtual machine. See below (Your Assignment) for more details.

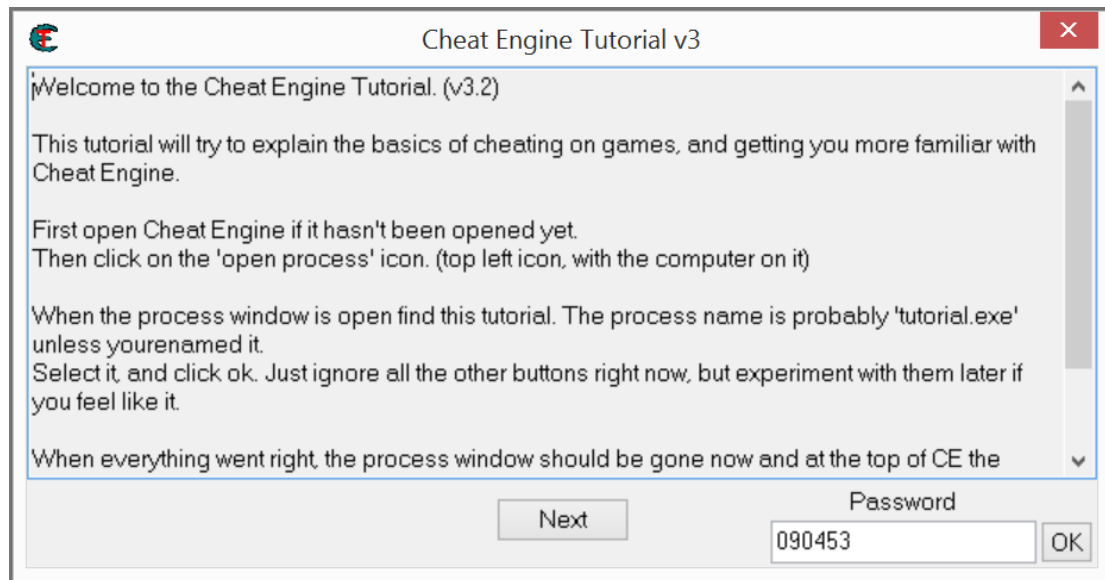
Files

You will need:

- The VMware Player: <http://www.vmware.com/products/player/>
- The virtual machine image: <http://www.cs.utexas.edu/~shmat/courses/cs361s/>



Reverse engineering puzzles





So how is hacking taught?

- Teach people how to use the tools
- Set people up to make their own discoveries
- Empowerment is the key



Why do people learn to hack?

- To crack software (becoming rarer)
- To hack servers (becoming dangerous)
- To get a job at the NSA (please don't)
- To cheat at video games (mostly safe!)



The Hack 'n' Slash curriculum

- Variable manipulation





The Hack 'n' Slash curriculum

- Observing hidden state





The Hack 'n' Slash curriculum

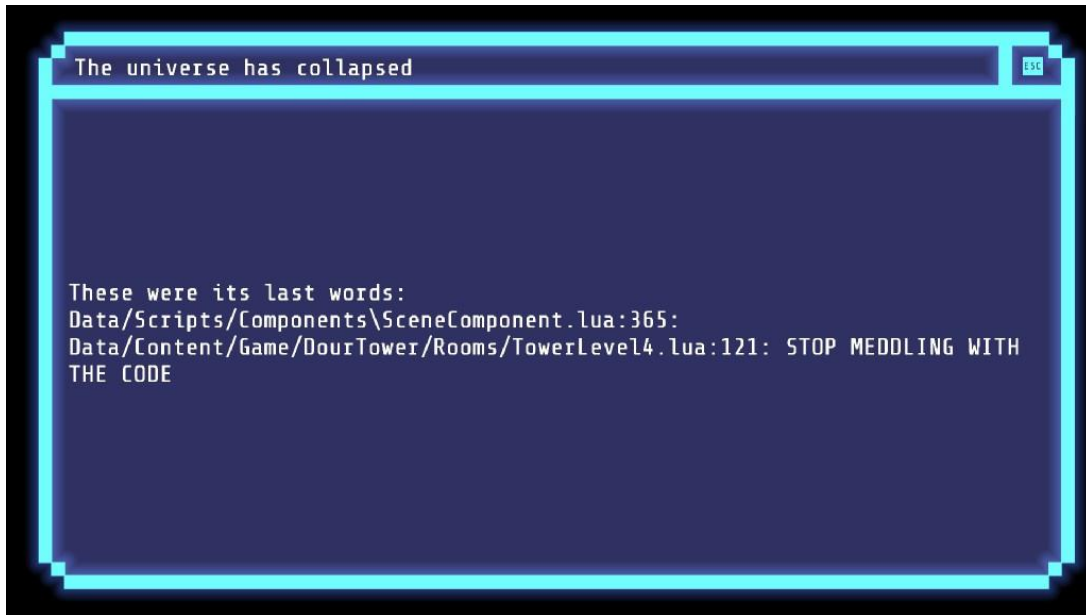
- Understanding code





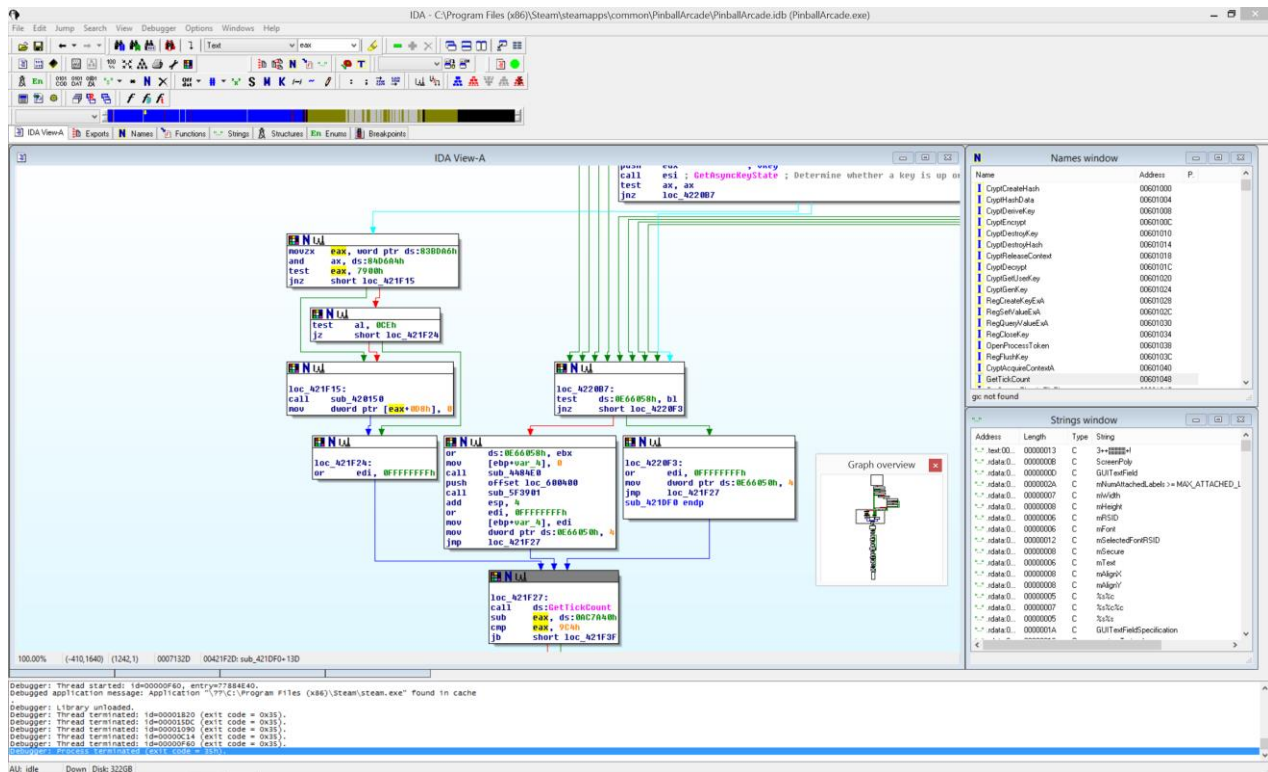
The Hack 'n' Slash curriculum

- Fighting hostile code





Broadening the appeal





Broadening the appeal

- Take advantage of familiar concepts





Broadening the appeal

- Create an inviting environment





Broadening the appeal

- Make funny faces





Surprising demographic results

- Technical adults get far
- Non-technical adults often don't
- Kids get further

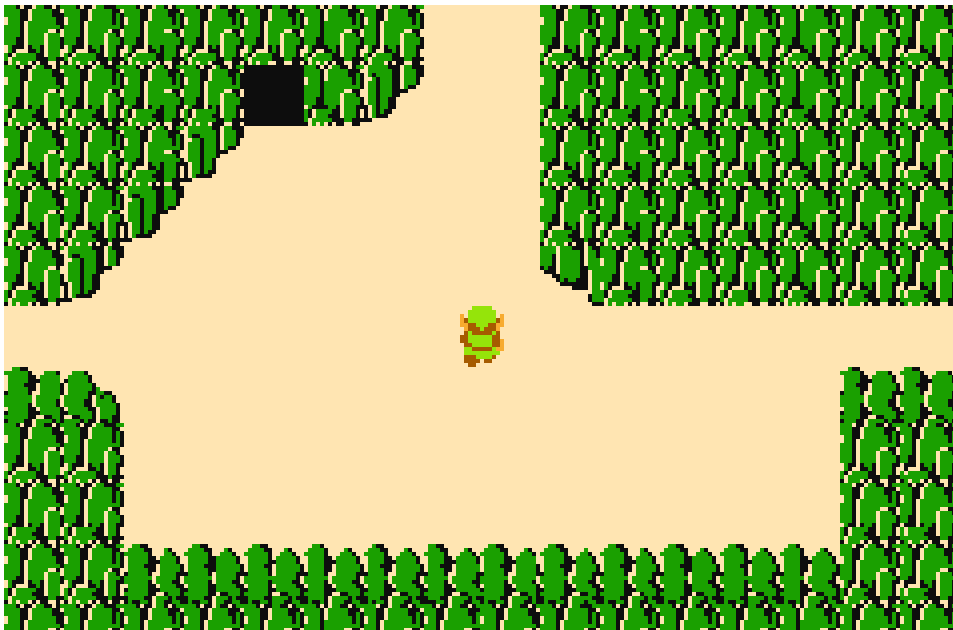


Advice on ignoring design advice

- “I see a lot of hack but not a lot of slash”



Check your assumptions



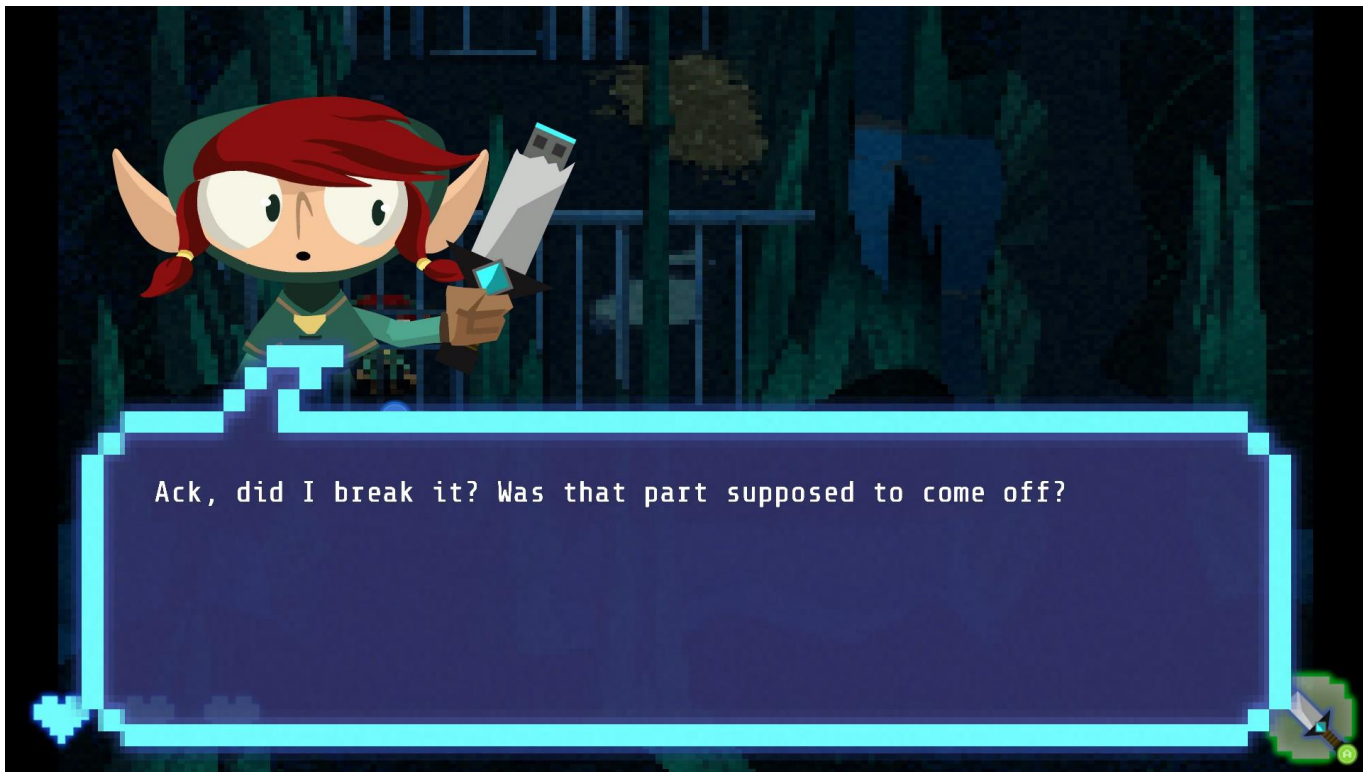


Check your assumptions





What you can leave behind?





Thanks!

- Web: hacknslashthegame.com
- Zelda ROM hacking:
<http://youtu.be/FolqIgQRtl0>
- Me on Twitter: @noughtceratops