



### ***Phil Youngblood - Vic Michalak (Second Life)***

Welcome to The Science Circle!

This is the first of two presentations on computer programming.

Computer programming can be a daunting adventure.

Sometimes you may feel like you have god-like powers!

At other times you may feel like you have no idea what you are doing.

Today I would like to help you feel more like the former.

Computer programming IS a powerful skill because it is one of the primary ways we talk to computers.

Computers are just machines. So do/how can we talk with a machine?

**Tulpa (jes.cobalt)** is the dog 100% of the time

**Bruce (bruce.mowbray):** ha ha.

**Chantal (nymf.hathaway):** My car yes ☺

**Bruce (bruce.mowbray):** through a language...

**Miller Rust:** you give it discreet commands

**Chantal (nymf.hathaway):** Hoping it brings me home safe ☺

**Leo Mandelbrot:** Push buttons and move a wheel

**Vic Michalak:** First we have to find a common language.

BUT, if we want more people to learn how to program, we need to find a way to translate programming into a way that humans think.

First, it helps to know something about how computers think.

**Wisdomseeker (lissena):** yes, I was a weaver

**Bruce (bruce.mowbray):** I have, but not one that elaborate.

**Tulpa (jes.cobalt):** Hi Moon ☺ We're in voice and text chat today

**Chantal (nymf.hathaway):** Moon ☺



**Vic Michalak:** 1790s - punched cards are used to program a loom to create patterns in textiles.

1830s - an analog computer is developed that can do arithmetic.

[Ada Lovelace](#) uses punched cards to instruct the machine to operate.

Lovelace is considered the world's first programmer because programming is about telling a computer what to do.

**Tulpa (jes.cobalt):** Awesome name, I like it hehe

**Wisdomseeker (lissena):** mine was Swedish, 8 harness

**Leo Mandelbrot:** Ada Lovelace

**Kayla (hikaru.yamamoto):** the 1st programmer?

**Tulpa (jes.cobalt):** Hi Skullphern ☺

**Paolo Rousselot:** for some Native Americans weaving was quite a sacred, meditative experience...

**Kayla (hikaru.yamamoto):** i knew that i forgot the name xD

**Miller Rust:** I guess it wasn't Pascal then :D



**Vic Michalak:** [Herman Hollerith](#), a recent immigrant, invents a machine to tabulate the census information. Hollerith uses punched cards to represent the information about each individual. He finds a company that merges with another to become IBM in 1911.

**Leo Mandelbrot:** Ahh yes Hollerith cards used in a 19th century census

**Bruce (bruce.mowbray):** IBM

**Kayla (hikaru.yamamoto):** apple? XD

**Tulpa (jes.cobalt):** Heheheh, apple

**Miller Rust:** incredibly boring machinery :D

**Wisdomseeker (lissena):** feeling much more hopeful about programming now that I know all this stuff comes from weaving!

**Vic Michalak:** 1960s - computers cost US\$1 million and companies start to use them for business.

**Chantal (nymf.hathaway):** Wisdom ☺

**Wisdomseeker (lissena):** my first job was working with punch cards at GE

**Leo Mandelbrot:** I remember punch cards and dropping the deck on the floor

**Moonsnail Mandelbrot:** I learned first on punch cards

**Wisdomseeker (lissena):** you have a Mature audience here :)

**Moonsnail Mandelbrot:** And I typoed a lot it was awful.

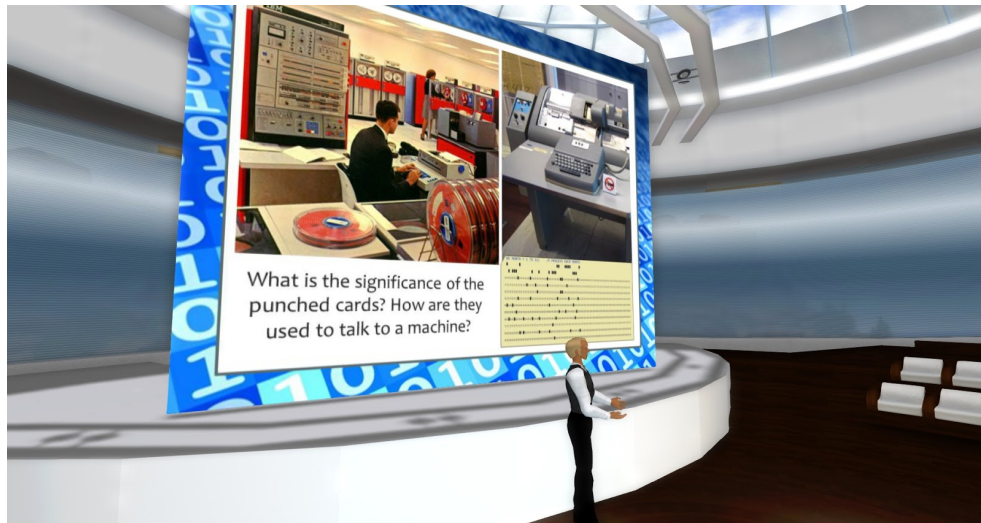
**Vic Michalak:** Punched cards are still used for input of computer programs.

Why punched cards? How do you talk to a machine with punched cards?

**Paolo Rousselot:** create chads!

**Moonsnail Mandelbrot:** Concept of punch cards used for weaving, too.

**Bruce (bruce.mowbray):** [Boolean](#) -- either punched or not...



**Vic Michalak:** The key is that computers as we know them basically work with electronic switches called transistors.  
 We can turn transistors on and off billions of times a second.  
 We call on "1" and off "0".  
 Then we arbitrarily assign patterns to 1s and 0s to represent language symbols, colors, and sounds.



**Paolo Rousselot:** 1's & 0's seems inherently limited  
**Vic Michalak:** 1930s - One breakthrough idea was that it did not matter if everything was 1s and 0s.  
 What mattered was context. [Alan Turing](#) and [John von Neumann](#) figured this out.  
**Leo Mandelbrot:**  $6^{*(2:3)}$   
**Bruce (bruce.mowbray):** The Imitation Game.

**Vic Michalak:** 1940s - Back before software, instructions were entered by switches and logic was represented by cables.

1970s - Interestingly, switches were also used to input 1s and 0s individually in the first portable computer.

**Leo Mandelbrot:** the first personal computer

**Stranger Nightfire:** [Altir](#)



**Vic Michalak:** 1950s - [Grace Hopper](#) (later Admiral) invented one of the first programming languages - [COBOL](#).

It was used for business and looked a lot like human language - another great breakthrough!

Hopper, a legend in computing, also coined the term 'bug' to represent an error.

**Miller Rust:** [FORTRAN](#), COBOL, [ALGOL](#) and.. uhm.. how old is [Ada](#)?

**Miller Rust:** language, "a bug in the system"

**saraca1:** Common Business Oriented Language

**Vic Michalak:** 2010s - Today there are many programming languages that are used for different purposes.

So how would you start to learn programming? Seems daunting...

**Leo Mandelbrot:** Moon we need that poster in the house

**Chantal (nymf.hathaway):** :)))

**Moonsnail Mandelbrot:** OK

**Vic Michalak:** 2013 - [Code.org](http://code.org) (non-profit) working with MIT Media Lab developed a visual programming tutor for all ages.

**Leo Mandelbrot:** two kids

**Bruce (bruce.mowbray):** yes.

**Moonsnail Mandelbrot:** The free online coding project?

**Vic Michalak:** They invited schools and people to learn programming during [Computer Science Week](#) in 2013 and 2014.

**Leo Mandelbrot:** haven't heard of it

**Bruce (bruce.mowbray):** (me neither.)

**Vic Michalak:** The response has been phenomenal!

**Moonsnail Mandelbrot:** <<<Loves alternative ways of learning

**Vic Michalak:** While Facebook took 3 years to reach 15 million users, the Hour of Code accomplished this in 5 days!

**Moonsnail Mandelbrot:** Yipes!

**Chantal (nymf.hathaway):** That's a success

**Moonsnail Mandelbrot:** Removes the math stigma

**Bruce (bruce.mowbray):** WOW!



**Vic Michalak:** Just in 2013 alone, more girls tried computer programming worldwide than in the last 70 years!

There are over 75,000 schools and other educational locations worldwide which have tried this online tutor.

will bet that you can find a school near you that has tried this.

So... I would like to invite you to go to <http://www.hourofcode.com> with me now and try it yourself!

**Bruce (bruce.mowbray):** two cartoon characters...

**Leo Mandelbrot:** Anna and Elsa, from Frozen

**Moonsnail Mandelbrot:** I am there

**Vic Michalak:** Let me know when you have completed the video (3 minutes)...

**Chantal (nymf.hathaway):** ack clicked the wrong language and now it sticks... but I have watched it all with my son earlier this week... who immediately started and is... as all young ones... happy with the results ☺

**Bruce (bruce.mowbray):** :)

**Chantal (nymf.hathaway):** Its great Vic!

**Vic Michalak:** It is in 30+ languages -- change at top right

**Chantal (nymf.hathaway):** yes I know... will try again but it sticks so far :( even by a new visit

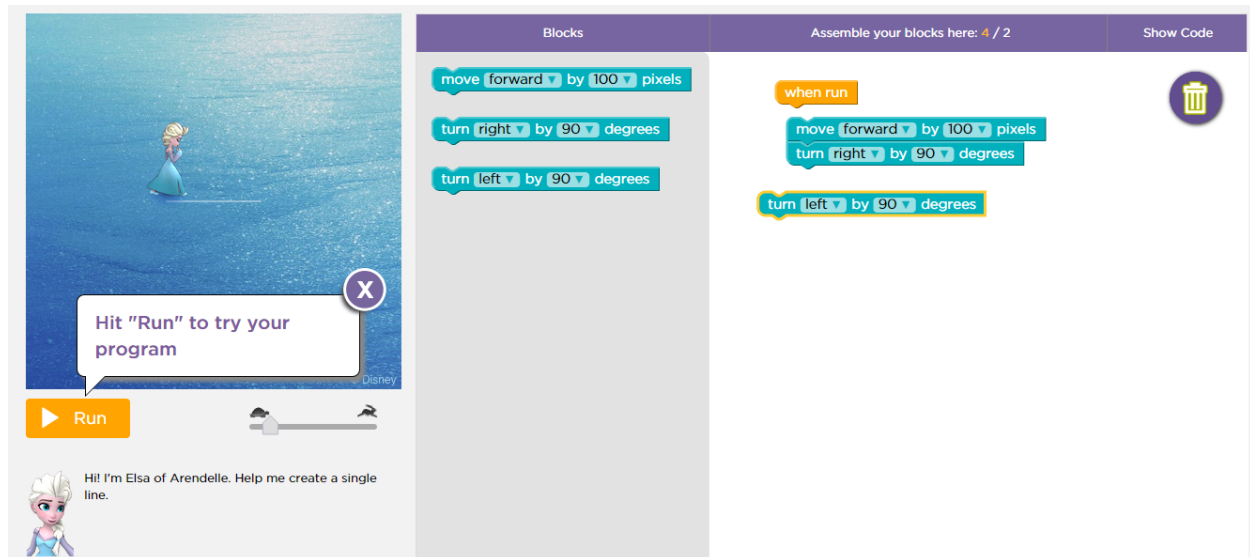
**Vic Michalak:** I am about 2 minutes through the video...

**Chantal (nymf.hathaway):** Pamācības tavā valodā hahaha no luck

**Vic Michalak:** You can click off the video (big purple X) and try the first problem... It is self-explanatory....

**Leo Mandelbrot:** I hope I'm looking at the right video it's about people learning to code

**Moonsnail Mandelbrot:** finished



**Vic Michalak:** <http://studio.code.org/s/frozen/stage/1/puzzle/1> -- shortcut. If you watched the video, click on the X

**Wisdomseeker (lissena):** done

**Paolo Rousselot:** wonderful!

**Stranger Nightfire:** I can remember using a programming language that worked like that once

**Leo Mandelbrot:** No I watched a different video. Watching that one now

**Moonsnail Mandelbrot:** I'm missing something. Keep getting note that my blocks are not attached

**Vic Michalak:** Okay... make sure the blocks are physically touching... should click. If you are stuck, let me know... I will help...I am at the first problem

**Moonsnail Mandelbrot:** Ok, had to stretch my screen, column was too tight

**Vic Michalak:** Yes... it is okay to overlap SL... Nothing too exciting here! ☺ To me your avatars are all sitting there! ☺

**Bruce (bruce.mowbray):** COOOOL!

**Skullphern:** iv done a few

**Leo Mandelbrot:** Just moved the first block

**Moonsnail Mandelbrot:** No, the trash can was too, close, kept stealing my code blocks

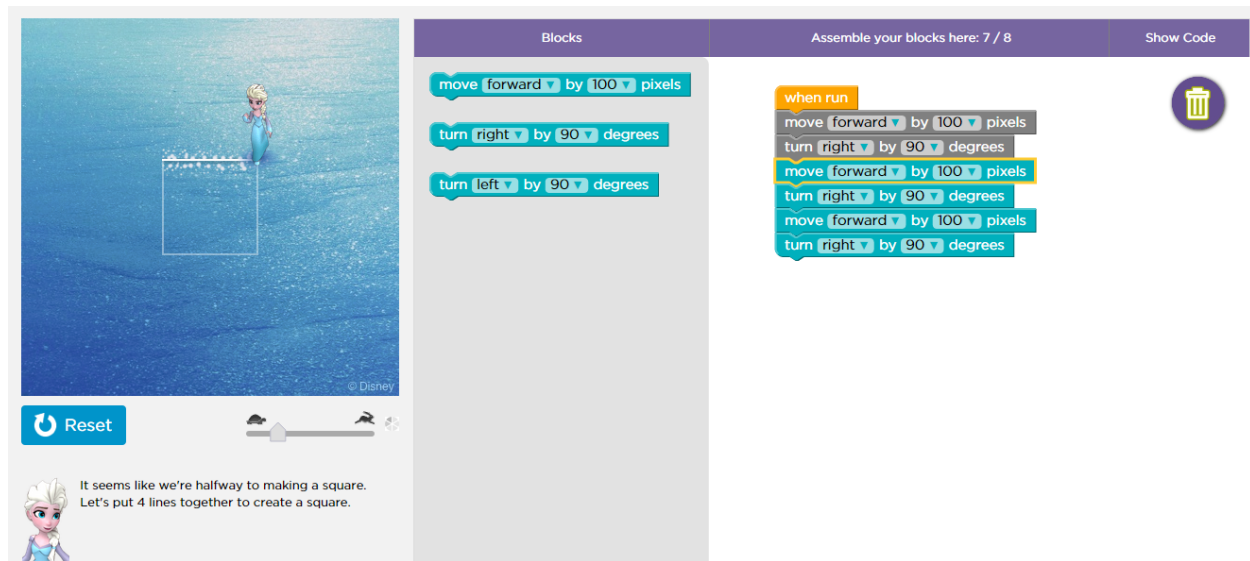
**Skullphern:** I think theres actually a SL scripting app that works just like this

**Vic Michalak:** Go to full screen

**Chantal (nymf.hathaway):** Really Skullphern!

**Skullphern:** Yes, actually.

**Moonsnail Mandelbrot:** Ok, looking for the run button



**Vic Michalak:** Speaking of which, on Feb. 11 I will teach you how to do some programming in Second Life!

**Skullphern:** here let me see if I can find it for you

**Chantal (nymf.hathaway):** Thats interesting

**Stranger Nightfire:** trying to remember where I have used a visual code builder that worked like that

**Vic Michalak:** RUN button on the far left

**Bruce (bruce.mowbray):** She skates and follows the directions in the code!

**Wisdomseeker (lissena):** finally figured out how to nest the lines

**Vic Michalak:** Yes, instant feedback for students. That is one thing I like about it...

**Stranger Nightfire:** I think there is one that builds LSL that works like that

**Bruce (bruce.mowbray):** All the blocks need to touch, starting with the "when run" block at the top.

**Vic Michalak:** No problem, Wisomseeker... new interfaces are always challenging at first. Yes, the blocks must touch... you can hear a click (aural feedback)

**Moonsnail Mandelbrot:** No run button to push. Going to reload

**Leo Mandelbrot:** I just finished the square

**Bruce (bruce.mowbray):** Yayyy!

**Vic Michalak:** hmmm... under the picture at the left?

**Wisdomseeker (lissena):** tells me I am using all the block but not in the right way--oh dear

**Skullphern:** Ah here it is: <http://www.miceonabeam.com/> ...I think I saw another one sometime as well.

**Vic Michalak:** Thanks, Skullphern! I will look at that after the presentation...

**Chantal (nymf.hathaway):** Thank you Skull ☺

**Bruce (bruce.mowbray):** Wow. I'm going to save that LSL link. Thanks!

**Moonsnail Mandelbrot:** reload the page - voila! Run button. 1st one done

**Paolo Rousselot:** Great fun - brilliant! Will return & play more

**Vic Michalak:** I thought so...

**Moonsnail Mandelbrot:** Got her to turn in place!

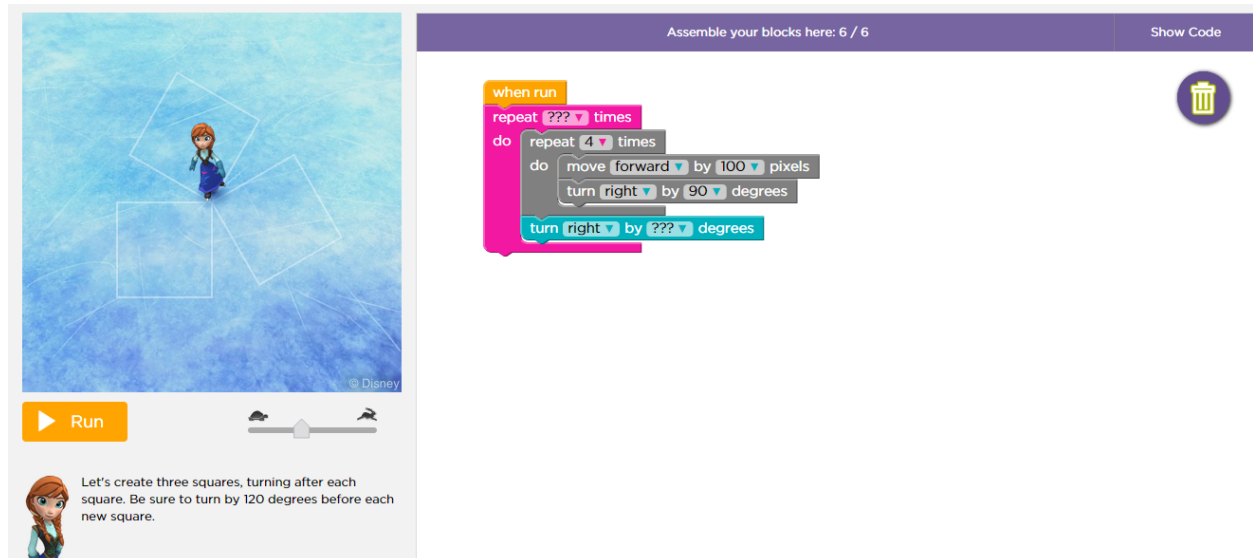
**Vic Michalak:** Great!

**saraca1:** it is nice it uses selection looping all in interesting ways

**Wisdomseeker (lissena):** it is fun

**Leo Mandelbrot:** Did the three squares

**Moonsnail Mandelbrot:** Puzzle 2 done



The screenshot shows a programming interface with a character on a blue background. The code area contains the following blocks:

```
when run
repeat ??? times
do
  repeat 4 times
  do
    move forward by 100 pixels
    turn right by 90 degrees
  turn right by ??? degrees
```

Below the code area, there is a 'Run' button and a slider. A text box at the bottom left says: "Let's create three squares, turning after each square. Be sure to turn by 120 degrees before each new square."

**Vic Michalak:** I always like it when the audience can participate in a presentation... this is the hands-on part....

**Paolo Rousselot:** I'll share this with my wife who specializes in teaching science to teachers

**Chantal (nymf.hathaway):** I will share it with the school of my son... if they do not know it already

**Vic Michalak:** Excellent... As I said, I tried it in December with students from 8-18 and they all liked it.

**Chantal (nymf.hathaway):** I saw the same with Xylan 10 years old

**Vic Michalak:** Great!

**Moonsnail Mandelbrot:** Fun, no age limit on this!

**Tulpa (jes.cobalt):** agrees Moon!

**Chantal (nymf.hathaway):** Maybe something for your Sim activities too Wisdom?

**Tulpa (jes.cobalt):** hehehe

**Wisdomseeker (lissena):** yes!

**Leo Mandelbrot:** got as far as 8

**Chantal (nymf.hathaway):** its Leo... figures ☺

**Moonsnail Mandelbrot:** Leo is a Whiz!

**Chantal (nymf.hathaway):** yes ☺

**Leo Mandelbrot:** This looks like something I can pass on to my unschooled friends.

**saraca1:** will we be also learning about dialog box

**Bruce (bruce.mowbray):** a very non-threatening environment. I like it!



**Moonsnail Mandelbrot:** I want to play and explore. Glad to wait until after. Different style from Leo's.

**Wisdomseeker (lissena):** the problem with SL is too much distraction--will do the rest outside SL to be able to focus better

**Vic Michalak:** Good feedback... Here again, I am interested in teaching and alternative ways to teach.... I have no relationship with code.org... just found it to be a great way to teach the basic concepts of programming...

**Moonsnail Mandelbrot:** Do you want feedback post lecture?

**Bruce (bruce.mowbray):** engagement without intimidation...

**Vic Michalak:** Yes, and in a couple of minutes...

**Moonsnail Mandelbrot:** Yes, Bruce!

**Wisdomseeker (lissena):** I attended a presentation on this at NPC too--nice to have a chance to explore it in depth

**Vic Michalak:** Good... it has been popular worldwide...

**Leo Mandelbrot:** Vic this is a great "back to basics" review for someone who took comp sci a long long time ago

**Vic Michalak:** Yes, I thought so.... Many people have had a programming class, but forgot the basics...

**Wisdomseeker (lissena):** and for those of us who never had programming this is a godsend

**Vic Michalak:** Hopefully today you feel more god-like than not knowing anything about programming...

**Wisdomseeker (lissena):** actually I do!

**Tulpa (jes.cobalt):** Bookmarked, yes! :))

**Chantal (nymf.hathaway):** hehehehhe

**Tulpa (jes.cobalt):** ☺

**Moonsnail Mandelbrot:** Nice way to get your head wrapped around programming again.

**Vic Michalak:** Next week (Feb. 11) I will discuss what you learned with this visual lesson and how it ties into modern programming languages. I will also show you many interesting ways to learn more or to show others how to learn more about programming.



**Bruce (bruce.mowbray):** [Khan Academy](#) is excellent.

**Vic Michalak:** [EdX](#)

**Chantal (nymf.hathaway):** yes

**Wisdomseeker (lissena):** yes--[Moocs](#)

**Moonsnail Mandelbrot:** Ah, yes, and what goals would be best to have - need a reason to code. Smartphone programming for personal use. [Future Learn](#), [Coursera](#)

**Vic Michalak:** [Harvard CS50](#)

**Wisdomseeker (lissena):** now I might be able to talk intelligently with my 12 year old grandson

**Chantal (nymf.hathaway):** Needs to recommend this as well

<http://www.worldscienceu.com/>

**Moonsnail Mandelbrot:** You are the best online presenter I've encountered, esp. re: live interaction w/group.

**Tulpa (jes.cobalt):** YAY Vic ☺

**Bruce (bruce.mowbray):** Thank you, Vic. Thanks, Chantal!

**Paolo Rousselot:** Thanks Vic!

**Chantal (nymf.hathaway):** Thats a great compliment!

**Leo Mandelbrot:** I look forward to next week. CU all later.

**Tulpa (jes.cobalt):** Amazing, I liked that :)))

**Kayla (hikaru.yamamoto):** thank you!

**saraca1:** thanks

**Vic Michalak:** Thank you for being here! I hope you enjoyed it...

**Chantal (nymf.hathaway):** Wonderful Vic!!!!

**Moonsnail Mandelbrot:** Serious, Chan! Vic rocks bigtime.

**Chantal (nymf.hathaway):** HI5 to that :)))

**Vic Michalak:** Thanks, Moonsnail... ☺

**Moonsnail Mandelbrot:** :)

**Chantal (nymf.hathaway):** Thanks everyone for joining and hope to see you next week ☺  
for part 2

**Moonsnail Mandelbrot:** Looking forward to transcript...Have meetings most Tuesday mornings.

**Moonsnail Mandelbrot:** This was great!

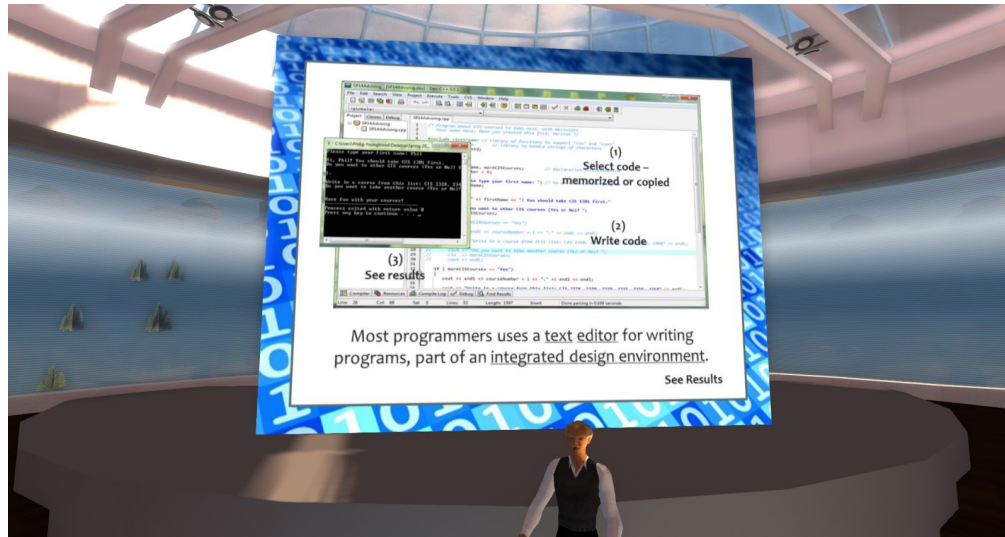
**Wisdomseeker (lissena):** is this the same day and time next week?

**Vic Michalak:** Yes, most likely same time next week...

**Tulpa (jes.cobalt):** Oh good :))) we got it all



## Part 2



**Vic Michalak:** At very top, you see `#include` statements

**Moonsnail Mandelbrot:** Thanks, got it!

**NullSubset Burner:** function calls

**Vic Michalak:** Approximate number of pixels on a screen?

**Leo Mandelbrot:** 1920 by ....something

**NullSubset Burner:** `if ,else, case -itterate(count)`

**Tulpa (jes.cobalt):** :))) [Flowcharts](#), I remember using those

**NullSubset Burner:** [Pseudocode](#)

**Vic Michalak:** <https://www.khanacademy.org/>

**Moonsnail Mandelbrot:** There are phone and tablet apps for Khan, as well. Good, re: iOS personal apps! Also there is [IFTTT](#)

**NullSubset Burner:** oooo-bookmarks. Link? please

**Leo Mandelbrot:** [coursera](#) and [futurelearn](#)

**Vic Michalak:** <https://www.edx.org/>

**Chantal (nymf.hathaway):** I know them but I didn't do a course

**Vic Michalak:**

<https://www.edx.org/course/introduction-computer-science-harvardx-cs50x#.VNurZfnF-So>



**Moonsnail Mandelbrot:** Excellent, MOOCS- you can audit or be certified. Some MOOC classes are on demand, others are live/time sensitive. Hardest is to define the goal. EX: I need to find how to tie shoelaces vs I need to keep shoes closed so they don't fall off my feet.

**NullSubset Burner:** Oh dear Vic 60,s= Batch Jobs and card trays - hehehehe :)

**Leo Mandelbrot:** Very little room for error, with 1 day turnaround

**Vic Michalak:** What percentage of people in the world use the Internet today?

**Chuck Kalok:** 15?

**Moonsnail Mandelbrot:** 60%

**NullSubset Burner:** 20?

**Chantal (nymf.hathaway):** 20?

**Shailey Garfield:** 35?

**Moonsnail Mandelbrot:** If you include phones

**Leo Mandelbrot:** My guess around 40 pct

**Moonsnail Mandelbrot:** Third world countries use phones in dim huts

**Chantal (nymf.hathaway):** Miracle we are all in this lecture hall... looking at the percentage

**Moonsnail Mandelbrot:** Absolutely SL, it's wonderful.

**Shailey Garfield:** it is such a great experience

**Tulpa (jes.cobalt):** wonders if she's feeling like the dog today....

**Chantal (nymf.hathaway):** ☺

**Areyn Laurasia:** [spaghetti code](#).. ^^

**Moonsnail Mandelbrot:** Heard about it.

**NullSubset Burner:** work in fast food?

**Tulpa (jes.cobalt):** ☺

**Moonsnail Mandelbrot:** Absolutely! Failure IS part of the road to success. Can't be afraid to fail, and you can do it privately with coding.

**Chantal (nymf.hathaway):** Good point Moon

**Moonsnail Mandelbrot:** Keeps the ice polished.

**Leo Mandelbrot:** Yeah but you don't remember submitting batch runs, 1 day turnaround. Two or three failures and you are late with your homework

**Shailey Garfield:** Leo, I remember.

**Chuck Kalok:** sounds like most of us here program

**Moonsnail Mandelbrot:** Good point, Leo. And I typed on the punch cards.

**Vic Michalak:** Questions?



**Shailey Garfield:** It was good how you related programming to development of other skills such as problem solving, team building, etc.

**NullSubset Burner:** Vic, can't thank you enough for your patience - you're a great role model for me on how to conduct yourself as an enthusiastic and engaged educator - thank you!!!!)

**NullSubset Burner:** XEROX

**Chuck Kalok:** wisdom is where you find it.

**Chantal (nymf.hathaway):** Thank you Vic, wonderful!

**Tulpa (jes.cobalt):** You are amazing Vic 😊 Thank you

**Shailey Garfield:** Thanks, Vic; thanks to Chantal and Jes.

**Leo Mandelbrot:** CU all soon. Good stuff. For Moon and me, a good start to the day

## THE SCIENCE CIRCLE

