

# TECHKNOWLEDGY

December 2016

**BACK IN TIME:  
COMPUTERS  
THAT CHANGED  
THE COURSE OF  
HISTORY**

# Spotlight Coder: Lynn Conway

From her accomplishments and her perseverance, Lynn Conway is an inspirational computer scientist. As a child, Conway loved

astronomy, mathematics, physics and electronics. Her father gave her a book called “Wonder Book of knowledge,” which taught her about electricity and how radios were created.

In 1962, Lynn graduated from Columbia University’s School of Engineering, and entered the work force with a job at IBM. At IBM, she was given a project to build a powerful scientific computer with her team. She was very successful in her career and made a lot of progress with her engineering skills.

Besides work, Conway knew that she wanted to transition to female, sought help and transitioned successfully in 1968. After the transition, she was fired from IBM, and lost visiting rights to her children. She fought through depression from her gender dysphoria.

But she did not give up; Conway applied and was accepted for a job at Memorex as a software designer and a computer architect. Later on in her career, she decided to work as an assistant professor for electrical and computer engineering at MIT to teach VLSI design. Also, she was a professor at the University of Michigan and various other notable institutions for engineering. As a professor, she had some failures with her projects, but she did not give up on the projects and tried different approaches to

Lynn received many innovation awards from the IEEE and Society of Women Engineers. Conway published many papers about computer engineering and received an honorary doctorate from the Illinois Institute of Technology in 2014. Aside from her awards, she is an activist for the transgender community. Lynn Conway is a strong and accomplished women who inspires many to go into the technology field and to help others be true to themselves.



# Break the Code

Can you solve these JAVA code riddles?

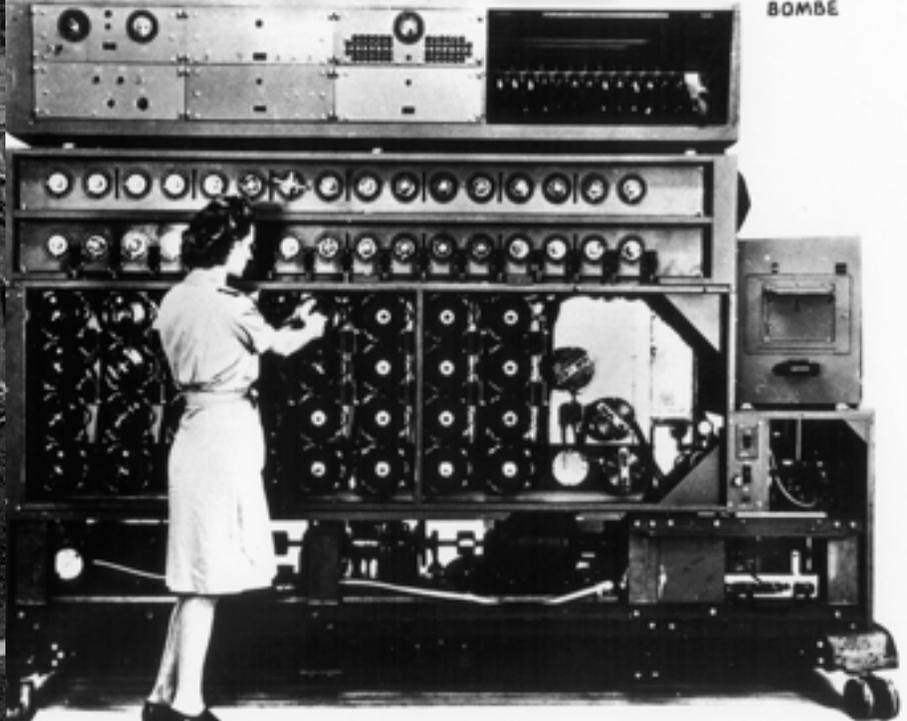
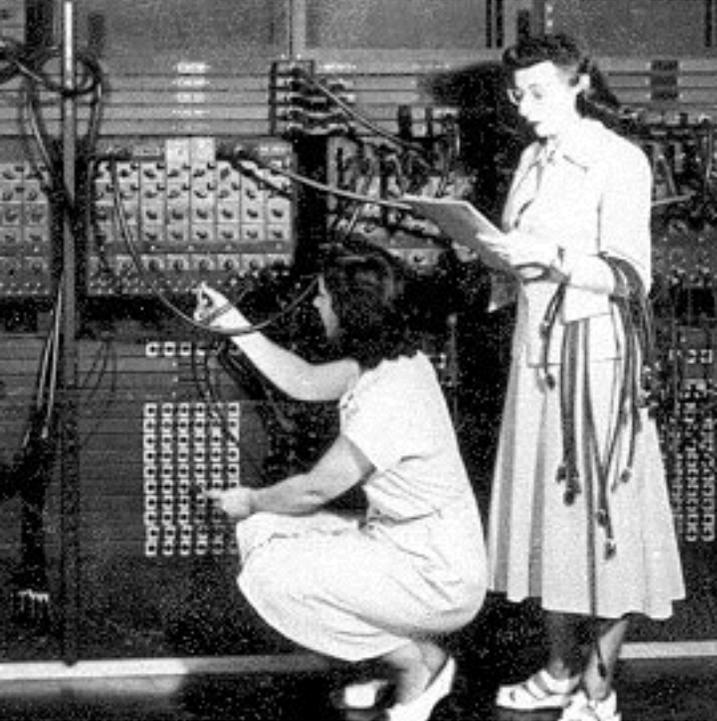
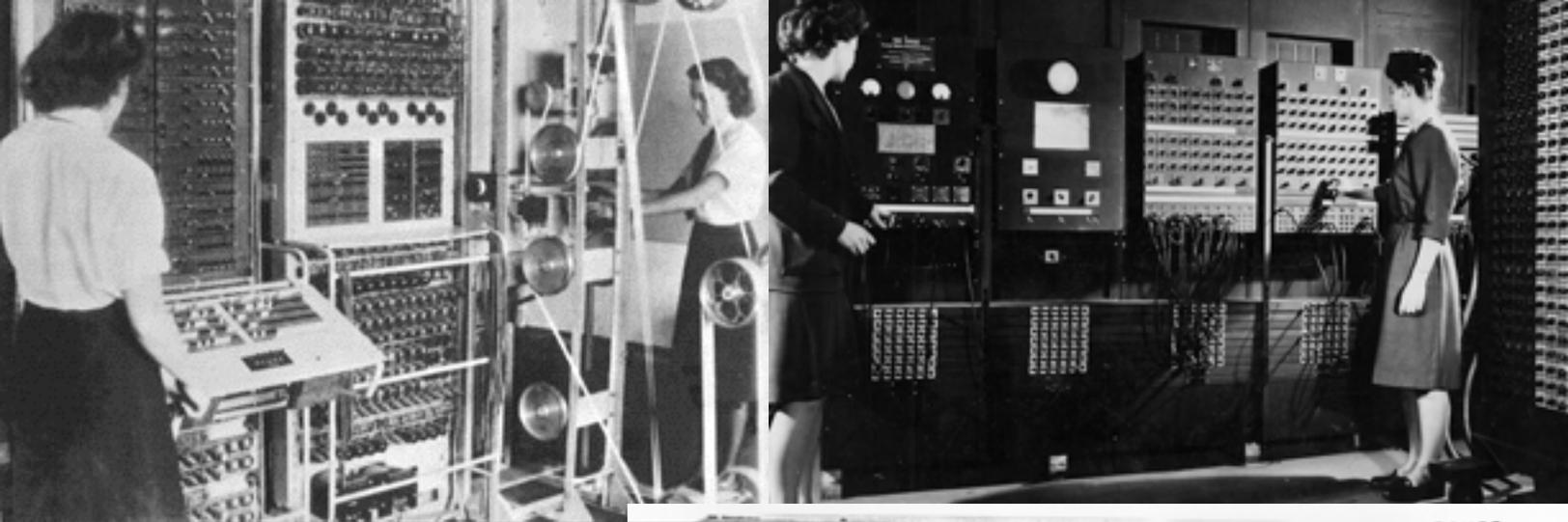
```
while (!stringEntered.equals("apple"))
{
    System.out.println( "Enter a red fruit: ");
    stringEntered = scan.next();
}
while (!stringEntered.equals("banana"))
{
    System.out.println("Enter a yellow fruit:
");
    stringEntered = scan.next();
}
while (!stringEntered.equals("pomegranate"))
{
    System.out.println("Enter a random fruit:
");
    stringEntered = scan.next();
}
```

Answer: \_\_\_\_\_

```
for (i = 0; i < 10 ; i++)
    System.out.println( "Interesting, isn't
it?");
```

```
while (answer.charAt(0) != 'D')
{
    System.out.print( "Enter an answer: ");
    answer = scan.next();
}
while (answer.charAt(0) != 'D')
{
    System.out.print( "Enter an answer: ");
    answer = scan.next();
}
```

Answer: \_\_\_\_\_



#ILOOGLIKEAPROGRAMMER



# How History Changed With COMPUTERS

In early computing history, men usually worked on the hardware of a computer and left the software to the women. Little did they know that software is very valuable, and takes great skill to program the machinery. The tremendous amount of grit and drive these programmers had to figure out the pieces of the puzzle helped them win wars and conquer great feats.

From war machines, to online gaming and space exploration, women have made various contributions to further the path of computer technology. Every "Great Man" history could not have been possible without the women at their side, ready to complete a challenge. Looking back in time, history would have been very different without the "behind the scenes" contributors. Make the contributors known; make them heard.

The future is at stake, and anyone can make an impact to change the course. A computer programmer of yesterday could inspire another person today. Tomorrow is approaching; start coding.

# SECRET COMPUTERS AND INVENTIONS DURING WORLD WAR II

Without these programmers and the new technology at this point in history, who knows how the war would have ended.

★  
After the Colossus II launched and the MARK1 was in use, the makings of the atomic bomb was in the process. Robert Oppenheimer was the lead of the secret project, also known as the Manhattan project, which would be later to be used against Japan.

★  
In February of 1944, Harvard University completed the computer known as the MARK1. This computer was a ballistics machine that helped pin point enemy locations. Grace Hopper, Howard Aiken and their team coded, debugged and improved the machine to gain more information and to help further end the war. This machine was built in the basement of Harvard, and was not too publicly known before the end of the war.

★  
Bletchley Park, the secret headquarters for Great Britain during the war, hired a team of women to program the Colossus Machine. The Women's Royal Naval Service worked on this project for several months, trying to code and program the machine to provide enemy intentions. Many historians believe that using the Colossus at this point in time significantly shortened the war. The machine was in use in 1944, but did not face public knowledge until the 1970's. Dorothy Du Boisson and Elise Booker are two notable WRNS who helped lead the project.

# Shoot For The Stars: Space Exploration Program Wants YOU!

Have a passion for physics, science or computing? Want to work with projects pertaining to space exploration? Then the Space Exploration Program is for you! The Space Exploration Program lets aspiring scientists to test their own experiments and to build computers to help further the knowledge of space.

If you are still on the fence, here are some stories about well known physicists that went through this program:

Back in 1958, James Van Allen researched about the radiation belts surrounding Earth. Later coined “Van Allen Belts,” James Van Allen found that the radiation belt is made of charged particles around a magnetized field of a planet. This concept helps understand space weather and how this kind of weather affects launched satellites.

Sekiko Yoshida analyzed experiments about cosmic rays on the Explorer 1. While doing research, Yoshida used a Japanese abacus to perform calculations about radiation particles, which was impressive since the calculations were very complex and had to be solved on a computer program. She completed the data analysis of Van Allen and without her help, Van Allen Belts would only be a qualitative idea without the quantitative data.

Their joint research helped engineers build better satellites and helped physicists learn more about the Earth’s properties in space. Research helps us understand the universe around us. Work with those who share your passion for science. Make your mark and sign up for the Space Exploration Program today!

**“Everything was new and exciting. We commuted wearing safety helmets and gas masks every day but underneath them, we felt alive.”**

**—Kane Watanabe,  
Yoshida’s lab partner**

Calculus and graphs are essential

When tracking the growth and  
development

Of life's journey

Straight lines, curved lines

Help find the slopes

That unfolds paths of

Different opportunities may bring

Positive or negative experiences

But looking at the larger view

On a graph

The Average Rate of Change

Is how one

Lived life in 'X' amount of time

Progressed, regressed, stagnant

Constant rapid change

A roller coaster of moments

The journey of figuring out

How 'X' and 'Y' relate

On a graph to infinity

How one and the world

Can move forward together

$$A(x) = \frac{f(x) - f(a)}{x - a}$$

Featured Poem  
Written by:  
Sarah Palmer  
2014

Computer gaming, such as League of Legends, Minecraft and Runescape, have been popular from the early 2000's and are still being played today. Before the 2000's, computers were not a common house hold item, so online games were not really something to look for. But long before these popular online gaming websites, what other platforms were available?

In 1979, Roberta and her husband, Ken Williams, developed Sierra Online, which was a popular website that had different graphic adventure games. The debut game was "Mystery House," where the character was trapped in an old victorian house with a murder, needing to escape while going through different challenges. This game was set us as a 2D, 2 toned game with a black background. It was a very simplistic design

"Wizard and the Princess" was the second game produced by Roberta Williams. She added color graphics and a complex story line to keep players interested. This game was then made into the sequel "King's Quest." The Hi-Res Adventure games were such a success that Ars Technica said "[Roberta Williams] was one of the more iconic figures in adventure gaming." These original games inspired other graphic designers to build gaming websites through the future decades. Her creative games and gaming features greatly influenced current online gaming.

# ONLINE GAMING IN THE 1980's

# BRAINFOOD

## SUDOKU

Level: Very Difficult

				3	6		5	
3						4		
		5	8		1		3	
9		6			3			
	2						8	
			4			5		6
	1		7		8	3		
		7						9
	4		1	6				

### Across:

- Place where the COLOSSUS was made
- Governance by people with a claim to technical expertise
- Thing that lets code to run
- Very large scale integration
- Machine worked on by both Grace Hopper and Jean Bartik
- Popular twitter Hashtag about women working in the STEM field
- Jean Bartik was the original programmer for this machine
- Developed the algorithm behind the Spanning Tree Protocol. First name.
- Business programming language, not open source

### Down:

- Department of military that focuses on technology
- British information technology pioneer, businesswoman, and philanthropist. full name.
- War that began in 1945 and ended in 1991
- Alfred Kinsley used this machine for sex research
- Russia launched this machine in 1957
- Purpose of the MARK1
- \_\_\_\_\_ Aiken worked with Grace Hopper on the MARK1 Project during WWII

## Computing History Crossword Puzzle

