OLLI WORKSHOP ON COMPUTERS VERSUS HUMANS

First Set of Visuals (September 14, 2010)

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Diagram of a **switching circuit** (relay) based on an electromagnet. When switch A closes, the electromagnet is activated and causes switch B to close. - One of the early IBM computers, built in 1948, consisted of 20,000 such relays and 12,500 vacuum tubes.

The word **bug** has its origins in the days of relays. One day (September 9, 1945) a moth was stuck between the contacts of a relay and Grace Hopper (1906-1992), one of the computer pioneers, logged the incident as a *bug*.

Because a switch can be either open or closed, computers can deal only with numbers expressed through 0's and 1's (binary system). Text can be also expressed through 0's and 1's, see the table on the right for examples.

Key	Numerical Code		
	Decimal	Binary	
space	32	00 100 000	
А	65	01 000 001	
а	97	01 100 001	
1	49	00 110 001	

Old-fashioned (left) and Modern (right) Encryption				
THE DOG ATE MY HOMEWORK				
ZRP OTQ LZP GD RTGPJTXU	YNL MYR NHT NA LTSLEXBV			

Code Breaking during WW-II - The Enigma Machine Conceptual Illustration (left) and the Real Thing (right)





Rotors of the German Encryption Machine ENIGMA Courtesy of Wikipedia

HOW TELL A HUMAN FROM A COMPUTER

To:

E-mail address:

Your Details:

Your name:

E-mail address:

Security image:

Please enter the numbers that appear here in the box below.

┥ Listen

Security code:

* INFORMATION REQUIRED







6385

SEND

ż

Completely Automated Public Turing test to tell Computers and Humans Apart

Speed of a PC with a 1.8 GigaHertz Pentium Processor				
Operation	Operations per second	Time per operation		
Integer Multiplication	One Billion	One Nanosecond		
Decimal Division	40 Million	25 Nanoseconds		
Square Root	20 Million	50 Nanoseconds		
Comparing Two Letters	One Billion	One Nanosecond		
Reading from the Hard Drive	Two thousand	Half a Millisecond		

Hard Drive Capacity				
Year	Capacity in Bytes	Capacity in Pictures or Books		
1980	one Megabyte (10 ⁶)	one		
1990	100 Megabytes (10 ⁸)	100		
2000	10 Gigabytes (10 ¹⁰)	10,000		
2010	1000 Gigabytes (10 ¹²)	one million		



THE SEMANTIC GAP:

For text the path from the internal computer representation to human interpretation and understanding is short and simple, while for pictures the path is quite long and tortuous.