**CODE AND POETRY READINGS:**

**Week 1**

* Preface, A Contribution to the Critique of Political Economy, Karl Marx
  + “In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness. At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or – this merely expresses the same thing in legal terms – with the property relations within the framework of which they have operated hitherto. From forms of development of the productive forces these elations turn into their fetters. Then begins an era of social revolution. The changes in the economic foundation lead sooner or later to the transformation of the whole immense superstructure.”
  + Not idealism – definite/actual relations between physical objects
  + “In studying such transformations it is always necessary to distinguish between the material transformation of the economic conditions of production, which can be determined with the precision of natural science, and the legal, political, religious, artistic or philosophic – in short, ideological forms in which men become conscious of this conflict and fight it out. Just as one does not judge an individual by what he thinks about himself, so one cannot judge such a period of transformation by its consciousness, but, on the contrary, this consciousness must be explained from the contradictions of material life, from the conflict existing between the social forces of production and the relations of production. No social order is ever destroyed before all the productive forces for which it is sufficient have been developed, and new superior relations of production never replace older ones before the material conditions for their existence have matured within the framework of the old society.” (pp 6)
  + Consciousness, material, production, social, foundation
* Surface Reading: An Introduction, Stephen Best and Sharon Marcus
  + We find ourselves the heirs of Michel Foucault, skeptical about the very possibility of radical freedom and dubious that literature or its criticism can explain our oppression or provide the keys to our liberation. Where it had become common for literary scholars to equate their work with political activism, the disasters and triumphs of the last decade have shown that literary criticism alone is not sufficient to effect change. This in turn raises the question of why literary criticism matters if it is not political activism by another name, a question to which we return in the last section of this essay.
  + When symptomatic readers focus on elements present in the text, they construe them as symbolic of something latent or concealed; for example, a queer symptomatic reading might interpret the closet, or ghosts, as surface signs of the deep truth of a homosexuality that cannot be overtly depicted. Symptomatic readings also often locate outright absences, gaps, and ellipses in texts, and then ask what those absences mean, what forces create them, and how they signify the questions that motivate the text, but that the text itself cannot articulate.
  + Surface looms large in the vocabulary of our contributors, but rarely do they mean the literal surface of texts: paper, binding, typography, the sounds of words read aloud. Nor do they construe surface as symp- tomatic readers often have—as a layer that conceals, as clothing does skin, or encloses, as a building’s facade does its interior. Following the lead of our contributors, we take surface to mean what is evident, perceptible, appre- hensible in texts; what is neither hidden nor hiding; what, in the geometri- cal sense, has length and breadth but no thickness, and therefore covers no depth. A surface is what insists on being looked at rather than what we must train ourselves to see through.
  + 16: Attention to the artwork itself is a kind of freedom – freedom in materialism “a true openness to all the potentials”
  + Surface as materiality, surface as verbal structure, surface as affective/ethical stance, using surface to find patterns in text
  + Freedom, politics/political
* Print is Flat, Code is Deep: The Importance of Media-Specific Analysis, Katherine Hayles
  + “Perhaps now, after the linguistic turn has yielded so many important insights, it is time to turn again to a careful consideration of what difference the medium makes” (68)
  + Turn toward materiality
  + One area where media-specific analysis can pay especially rich dividends is literary hypertext. Some theorists working in the area of electronic literature argue that hypertext ought to be reserved for electronic texts instantiated in digital media. In my view, this is a mistake. When Vannevar Bush, widely credited with the invention of hypertext, imagined a hypertextual system, it was not electronic but mechanical. His pioneering article (1945) testifies that it is possible to implement hypertext in a wide variety of ways, not only through the "go to" commands that comprise the hypertext link in digital computers. If we restrict the term *hypertext* to digital media, we lose the opportunity to understand how a literary genre mutates and transforms when it is instantiated in different media. The power of MSA comes from holding one term constant across media—in this case, the genre of literary hypertext—and then varying the media to explore how medium-specific constraints and possibilities shape texts. Understanding literature as the interplay between form and medium, MSA insists that "texts" must always be embodied to exist in the world. The materiality of those embodiments interacts dynamically with linguistic, rhetorical, and literary practices to create the effects we call literature.
  + 71: Materiality should be understood…depending on what performance…enacts
  + The crucial move is to reconceptualize materiality as *the interplay between a text's physical characteristics and its signifying strategies*. This definition opens the possibility of considering texts as embodied entities while still maintaining a central focus on interpretation. In this view of materiality, it is not merely an inert collection of physical properties but a dynamic quality that *emerges* from the interplay between the text as a physical artifact, its conceptual content, and the interpretive activities of readers and writers. Materiality thus cannot be specified in advance; rather, it occupies a borderland—or better, performs as connective tissue—joining the physical and mental, the artifact and the user.
  + Electronic hypertexts, like all electronic texts, consist of multiple layers of text that combine computer code and natural language. Typically, natural language appears at the top (screenic) level, although it is also frequently found at lower coding levels in comment lines. More subtly, it serves as ground for the syntax and grammar of computer languages, which are specifically permeated, as Rita Raley (2001) has argued, with the linguistic structures and grammar of English.
  + Dynamic, interplay, artifact, hypertext, medium, media-specific analysis
  + Materiality is dynamic, its meaning is dependent on conceptual content
* Plaintext Definition

  + Plaintext is a term used in cryptography that refers to a message before encryption or after decryption. That is, it is a message in a form that is easily readable by humans.
  + Encryption is the process of obscuring messages to make them unreadable in the absence special knowledge. It is usually done for secrecy, and typically for confidential communications. It can also be used for authentication (i.e., the process of confirming the identity of an individual or a transmission). Decryption is the opposite, i.e., the conversion of encrypted data into plaintext. Ciphertext is a message after encryption or before decryption.
  + Plaintext should not be confused with plain text. The latter refers to text consisting entirely of characters (e.g., those of an alphabet) that are used in some written human language, as contrasted with sequences of bits that do not represent human readable characters. Plaintext is written in plain text.

**Week 2**

* The Question Concerning Technology, Martin Heidegger
  + In what follows we shall be questioning concerning technology. Questioning builds a way. We would be advised, therefore, above all to pay heed to the way, and not to fix our attention on isolated sentences and topics (3).
  + Technology is not equivalent to the essence of technology. When we are seeking the essence of "tree," we have to become aware that that which pervades every tree, as tree, is not itself a tree that can be encountered among all the other trees (4).
  + Technology isn’t neutral
  + According to ancient doctrine, the essence of a thing is considered to be what the thing is. We ask the question concerning technology when we ask what it is. Everyone knows the two statements that answer our question. One says : Technology is a means to an end. The other says : Technology is a human activity. The two definitions of technology belong together. For to posit ends and procure and utilize the means to them is a human activity. The manufacture and utilization of equipment, tools, and machines, the manufactured and used things themselves, and the needs and ends that they serve, all belong to what technology is.
  + Instrumental vs. anthropological
  + Essence, freedom, human control, means to an end, human activity, bringing forth, modern technology, stockpiled
  + But this much remains correct : modern technology too is a means to an end. That is why the instrumental conception of technology conditions every attempt to bring man into the right relation to technology. Everything depends on our manipulating technology in the proper manner as a means. We will, as we say, Uget" technology "spiritually in han d." We will master it. The will to mastery becomes all the more urgent the more technology threatens to slip from human control (5)
  + Only the true brings us into a free relationship with that which concerns us from out of its essence. Accordingly, the correct instrumental definition of technology still does not show us technology's essence.
  + “for every bringing forth is grounded in revealing”
  + “technology is no mere means, it is a way of revealing”
  + Modern technology “challenging” nature – bad
* Do Artifacts Have Politics?, Langdon Winner
  + Two ways of understanding technology: technologically deterministic or socially determined, but doesn’t always work that way: ordering is political
  + Hence, the stern advice commonly given those who flirt with the notion that technical artifacts have political qualities: What matters is not technology itself, but the social or economic system in which it is embedded. This maxim, which in a number of variations is the central premise of a theory that can be called the social determination of technology, has an obvious wisdom. It serves as a needed corrective to those who focus uncritically on such things as "the computer and its social impacts" but who fail to look behind technical things to notice the social circumstances of their development, deployment, and use. This view provides an antidote to naive technological determinism: the idea that technology develops as the sole result of an internal dynamic, and then, unmediated by any other influence, molds society to fit its patterns. Those who have not recognized the ways in which technologies are shaped by social and economic forces have not gotten very far.
  + The theory of technological politics draws attention to the momentum of large-scale sociotechnical systems, to the response of modern societies to certain technological imperatives, and to the all too common signs of the adaptation of human ends to technical means. In so doing it offers a novel framework of interpretation and explanation for some of the more puzzling patterns that have taken shape in and around the growth of modern material culture. One strength of this point of view is that it takes technical artifacts seriously. Rather than insist that we immediately reduce everything to the interplay of social forces, it suggests that we pay attention to the characteristics of technical objects and the meaning of those characteristics. A necessary complement to, rather than a replacement for, theories of the social determination of technology, this perspective identifies certain technologies as political phenomena in their own right. It points us back, to borrow Edmund Husserl's philosophical injunction, to the things themselves (23).
  + Material objects have political implications
  + Low-hanging overpasses: Moses
  + Tomato harvester

**Week 3**

* As We May Think, Vannever Bush
  + Memex pg. 10
  + Bush urges people to think about relationships to knowledge, improve access to it
  + A record if it is to be useful to science, must be continuously extended, it must be stored, and above all it must be consulted. Today we make the record conventionally by writing and photography, followed by printing; but we also record on film, on wax disks, and on magnetic wires. Even if utterly new recording procedures do not appear, these present ones are certainly in the process of modification and extension.
  + Knowledge evolves
  + Media as extension of yourself
  + Of what lasting benefit has been man's use of science and of the new instruments which his research brought into existence? First, they have increased his control of his material environment. They have improved his food, his clothing, his shelter; they have increased his security and released him partly from the bondage of bare existence. They have given him increased knowledge of his own biological processes so that he has had a progressive freedom from disease and an increased span of life. They are illuminating the interactions of his physiological and psychological functions, giving the promise of an improved mental health.
  + “Science has provided the swiftest communication between individuals; it has provided a record of ideas and has enabled man to manipulate and to make extracts from that record so that knowledge evolves and endures throughout the life of a race rather than that of an individual.”
  + There is a growing mountain of research. But there is increased evidence that we are being bogged down today as specialization extends. The investigator is staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less to remember, as they appear. Yet specialization becomes increasingly necessary for progress, and the effort to bridge between disciplines is correspondingly superficial.
  + Personal vs. communal knowledge
* The Archiving Machine; or, The Camera and the Filing Cabinet, John Tagg
  + Looks at photography
  + Form of human identity, truth
  + Alternate archives
  + Problem with archive: too big to contain, too limited to know everything possible
  + “Apparatus of”
  + “The camera has become a…machine”
  + Archive as ground of historical study, an area of study in itself
  + “For one, the archive is not only given…For the other, the archive is constituted as…must and must not be”
  + Frame of knowledge
  + t h e a r c h i v e m a y b e r u l e d b y a n i n t e r n a l l o g i c t h a t g o v e r n s t h e p r o d u c t i o n o f i t s e v e n t s o f m e a n i n g , b u t i t i s s t i l l a l o g i c w h o s e p l a y a l l o w s f o r v a r i a t i o n , t r a n s f o r m a t i o n , a n d e v e n a s k e p t i c a l r e f l e x i v i t y
  + A r c h i v e s s t i l l r e t a i n , t h e r e f o r e , a p a r t i c u l a r a n d p e r h a p s p r i v i l e g e d r e l a t i o n t o t h e f i e l d o f t r u t h . Y e t t h i s r e l a t i o n s h i p i s a l w a y s f r a m e d b y t h e l a r g e r m a c h i n e r y o f g o v e r n m e n t a l i t y t h a t w o r k s i n p a r t , a s F o u c a u l t s h o w s , b y d e m a r c a t i n g b o u n d - a r i e s b e t w e e n t h e t r u e a n d t h e f a l s e , b y m o b i l i z i n g t h e m a n d b y b r i n g i n g t h e m t o b e a r , n o t l e a s t o n t h e d i f f e r e n t i a l r e l a t i o n s t o t r u t h w i t h i n w h i c h d e s i g n a t e d s u b - j e c t p o s i t i o n s a r e d i s t i n g u i s h e d a n d d e f i n e d . I n t h e s p a c e o f t h e a r c h i v e , t h e r e - f o r e , t h e p o l i t i c s o f t r u t h i n e v i t a b l y f o l d s i n t o a p o l i t i c s o f i d e n t i t y t h r o u g h t h e r e g u l a t i o n o f r e l a t i o n s h i p s b o t h t o t i m e , t r u t h , a n d m e m o r y a n d t o t h e p r a c t i c e s a n d t e c h n o l o g i e s o f r e c o r d a n d r e c o l l e c t i o n
* Files, Cornelia Vismann
  + Files are medium btwn administration and authority
  + Bartleby, kafka
  + About law, legal
  + Files are located on the meridian between spoken and written language
  + Oral cultures, orality, literacy, lists, laws to execution, process generators
  + Lists “at their core, files are governed by lists; lists program the emergence of files, hence they predetermine the sequence of steps that make up lists.”

**Week 4**

* Krapp’s Last Tape, Samuel Beckett
* Recent Contributions to the Mathematical Theory of Communications, Warren Weaver and Shannon
  + Theory of communication involving source, receiver
  + Views information as entropy, freedom of choice
  + Separates medium and message
  + “information is a measure of one’s freedom of choice”
  + That information be measured by entropy
  + Entropy = information
  + Binary digit – bit
  + Discrete, continuous
  + Information must not be confused with meaning
  + Entropy, channel, noise
  + The word information, in this theory, is used in a special sense that must not be confused with its ordinary usage. In particular, information must not be confused with meaning
* The Medium is the Message, Marshall McLuhan
  + Medium is an extension itself and provides meaning and affect in itself
  + Media as extension of ourselves
  + “any medium that is of any extension of ourselves”
  + “cubism…suddenly announced that medium is the message”
  + “affective meaning is made…another medium as content”
  + Movie, light: examples of medium and message being the same thing
  + Extension, medium
  + Thi s i s merel y t o sa y tha t th e persona l an d socia l consequence s o f an y medium—tha t is , o f an y extensio n o f ourselves—resul t fro m th e ne w scal e tha t i s introduce d int o ou r affair s b y eac h extensio n o f ourselves , o r b y an y ne w technology .
  + “the electric light is pure information”
  + I n acceptin g a n honorar y degre e fro m th e Universit y o f Notr e Dam e a fe w year s ago , Genera l Davi d Sarnof F mad e thi s state - ment : "W e ar e to o pron e t o mak e technologica l instrument s th e scapegoat s fo r th e sin s o f thos e wh o wiel d them . Th e product s o f moder n scienc e ar e no t i n themselve s goo d o r bad ; i t i s th e wa y the y ar e use d tha t determine s thei r value. " Tha t i s th e voic e o f th e curren t somnambulism . Suppos e w e wer e t o say , "Appl e pi e i s i n itsel f neithe r goo d no r bad ; i t i s th e wa y i t i s use d tha t determine s it s value. " Or , "Th e smallpo x viru s i s i n itsel f neithe r goo d no r bad ; i t i s th e wa y i t i s use d tha t determine s it s value. " Again , "Firearm s ar e i n themselve s neithe r goo d no r bad ; i t i s th e wa y the y ar e use d tha t determine s thei r value. " Tha t is , i f th e slug s reac h th e righ t peopl e firearm s ar e good . I f th e T V tub e fire s th e righ t ammunitio n a t th e righ t peopl e i t i s good . I a m no t bein g perverse . Ther e i s simpl y nothin g i n th e Sarnof f statemen t tha t wil l bea r scrutiny , fo r i t ignore s th e natur e o f th e medium , o f an y an d al l media , i n th e tru e Narcissu s styl e o f on e hypnotize d b y th e amputatio n an d extensio n o f hi s ow n bein g i n a ne w technica l form ! Genera l Sarnof f wen t o n t o explai n hi s attitud e t o th e technolog y o f print , sayin g tha t i t wa s tru e tha t prin t cause d muc h tras h t o circulate , bu t i t ha d als o disseminate d th e Bibl e an d th e thought s o f seer s an d philosophers . I t ha s neve r occurre d t o Genera l Sarnof f tha t an y technolog y coul d d o anythin g bu t add itsel f o n t o wha t w e alread y are .

**Week 5**

* Gramophone, Film, Typewriter, Kittler
  + Typewriter used during wartime for encoding, decoding – renders the creators/other humans useless in the process
  + “We see through the illusion of uniqueness. We are the letters produced by the writing hand of the world spirit and surrender ourselves consciously to this writing power. In that we recognize true freedom. In that we also see the means of putting ourselves into the position of the world spirit”
  + “World history comes to a close as a global typewriters’ association”
  + Golem, ENIGMA
  + Turing, von Neumann
* Analog and Analog, John Haugeland
  + Digital is positive, reliable
  + Analog: every difference makes a difference
  + Medium-independence of the digital
  + “in one system the tokens are…disks…sand”
  + “flawless copying and preservation are quite feasible”
  + Digital: copyability, medium-independence, complexity
  + Analog: smoothness, sensitivity, and dimensionality
  + “Standard examples of digital devices include Arabic numerals, abacuses, alphabets, electrical switches, musical notation, poker chips, and digital computers. What is important and distinctive about these cases? Several common features stand out: Flawless copying and preservation are quite feasible…complexity…equivalent structures in different media.”
  + Analog as “second-order digital”
* Analog and Digital Representation, Katz
  + Difference btwn analog and digital lies in the *format*, facts about the user
  + Complicates discrete vs. continuous: Many will want to say that system A is analog and that system B is digital. That intuition is likely due to the view that analog representation is continuous while digital representation is discrete. Since water is (or at least appears) continuous, system A is analog. Since marbles are discrete, system B is digital. But consider two more systems.
  + Representational systems are (typically) employed by someone or something. Whatever it is that employs a system of representations, in a given case, I will call the user of that system. The user is whatever part of the mechanism “reads” and “writes” the representations. In the above examples, whoever or whatever pours water or marbles into the beakers, or places marbles or beakers of water into arrays, is the user of those systems.
  + Note also that the idea that both analog and digital devices involve write–read cycles is essentially the idea that they involve a user. For the user just is whatever (or whoever) writes and reads the tokens. Moreover, whether a given margin of error is large enough to allow for positive procedures may turn on facts about the user of the representations.
  + User, user-based
  + Talks about Haugeland
  + parking car
  + margin of error
  + In short, analog representations appear continuous to their user, and digital representations appear discrete to their user. This concerns the format, and not the medium, of representation. Moreover, whether a given representational system is analog or digital will sometimes turn on facts about the user of that system. Finally, this view is implicit in Haugeland’s account of analog and digital devices.

**Week 6**

* "[A Re-examination of Bateson's Rule](https://courseworks.columbia.edu/access/content/group/ENGLW4911_001_2014_3/Gregory%20Bateson%20-%20Ecology%20of%20Mind.pdf)" pp 384-404 in *Steps to an Ecology of Mind* by Gregory Bateson.
  + Frog egg: receives information from outside
  + 401: summary: “it is suggested that information coded as morphological difference is essentially static…”
  + 386: information: “Information, in the technical sense, is that which *excludes* certain alternatives…any difference which makes a difference in some later event”
  + Key words: appendages, duplication, symmetry, cybernetics, bilateral
* A Foray into the Worlds of Animals and Humans, Von Uexkull
  + Ticks and deer
  + Objects become carriers of meaning only when in relationship with a subject
  + “the stone becomes a carrier of meaning as soon as it becomes in a relationship with the subject. As soon as the object appears as a carrier of meaning…each component is brought into…which serves as a carrier of meaning.” Throwing stone at barking dog
  + Meaning, relationship, carrier, tone, perception, effect marks
* A Discipline Independent Definition of Information, Losee
  + It’s a liberal definition of information that is consistent with Shannon’s model of communication
    - “information may be understood in a domain-independent way as the outcome of any process. This human centered view of information limits information…by the human mind.”
    - Information is any message going through a system
  + Knowledge is information that is both true and justified”
  + Information, input/output, cake, reversible process, perceiving, knowing, belief, misinformation, representation
  + Big view of what information is
  + “these interdisciplinary definitions are superior in some senses to discipline specific definitions useful in only one domain…A more general definition allows frameworks, theories, and results to be transferred across disciplinary boundaries, and provides for dialogue…”
  + “We suggest here a general definition of information: *information is produced by all processes and it is the values of characteristics in the processes’ outputs that are information.*
  + Similar to Shannon/Weaver, references Shannon

**Week 8**

* ENIAC: The Army-Sponsored Revolution, William T Moye
  + The only mechanical elements in the final system were actually external to the calculator itself. These were an IBM card reader for input, a card punch for out-put, and the 1,500 associated relays. By today's standards, ENIAC was a monster with its 18,000 vacuum tubes, but ENIAC was the prototype from which most other modern computers evolved. Its impact on the generation of firing tables was obvious. A skilled person with a desk calculator could compute a 60 second trajectory in about 20 hours; the Bush differential analyzer produced the same result in 15 minutes; but the ENIAC required only 30 seconds, less than the flight time.
  + During World War II, a "computer" was a person who calculated artillery firing tables using a desk calculator. Six women "computers" were assigned to serve as ENIAC's original programming group. Although most were college graduates, the "girls" were told that only "men" could get professional ratings. Finally, in November 1946, many of the women received professional ratings
  + By late 1943 or early 1944, members of the team had begun to develop concepts to solve one of ENIAC's major shortcomings -- the lack of an internally stored program capability. That is, as originally designed, the program was set up manually by setting switches and cable connections. But in July 1944, the team agreed that, as work on ENIAC permitted, they would pursue development of a stored-program computer.
* There is No Software, Friedrich Kittler
  + **Grammatologies of the** present time have to start with a rather sad statement. The bulk of written texts - including this text - do not exist anymore in perceivable time and space but in a computer memory's transistor cells.
  + **…**it also seems to hide the very act of writing: we do not write anymore. This crazy kind of software engineering suffered from an incurable confusion between use and mention. Up to Holderlin's time, a mere mention of lightning seemed to have been sufficient evidence of its possible poetic use. After this lightning's metamorphosis into electricity, human-made writing passes through microscopically written inscriptions which, in contrast to all historical writing tools, are able to read and write by themselves.
  + Finally, this 4004 microprocessor found its place in the new desk calculators of Intel's Japanese customer[1](http://www.ctheory.net/printer.aspx?id=74" \l "note%201) and our postmodern writing scene began. For the hardware complexity of such microprocessors simply discards manual design techniques; in order to lay out the next computer generation, the engineers, instead of filling out uncountable meters of blueprint paper, have recourse to Computer Aided Design, that is, to the geometrical or autorouting powers of the actual generation.
  + **Universal Turing machines,** when fed with the instructions of any other machine, can effectively imitate it. Thus, precisely because eventual differences between hardware implementations do not count anymore, the so-called Church-Turing hypothesis in its strongest or physical form is tantamount to declaring nature itself a universal Turing machine.
  + **This claim, in** itself, has had the effect of duplicating the implosion of hardware by an explosion of software. Programming languages have eroded the monopoly of ordinary language and grown into a new hierarchy of their own. This postmodern tower of Babel reaches from simple operation codes whose linguistic extension is still a hardware configuration passing through an assembler whose extension is that very assembler. As a consequence, far reaching chains of self-similarities in the sense defined by fractal theory organize the software as well as the hardware of every writing. What remains a problem is only the realization of these layers which, just as modern media technologies in general, have been explicitly contrived in order to evade all perception. We simply do not know what our writing does.
  + That is why the unpronounceable acronym WP, this posthistoric revocation of a fundamental Greek innovation, is not only necessary, but amply sufficient for postmodern wordprocessing. In fact, it seems to bring back truly magical power; WP does what it says. Executable computer files encompass, by contrast not only to "WordPerfect" but also to the big, empty old European words such as "Mind" or "Word", all the old routines and data necessary to their self-constitution. Surely, tapping the letter sequence of "W", "P" and "enter" on an AT keyboard does not make the Word perfect, but this simple writing act starts the actual execution of WordPerfect. Such are the triumphs of software.
  + **In fact, however,** these actions of agent WP are virtual ones, since each of them has to run under DOS. It is the operating system and, more precisely, its command shell that scans the keyboard for eight bit file names on the input line, transforms some relative addresses of an eventually retrieved file into absolute ones, loads this new version from external mass memory to the necessary random access space, and finally (or temporarily) passes execution to the op code lines of a slave named WordPerfect.
  + When meanings come down to sentences, sentences to words, and words to letters, there is no software at all. Rather, there would be no software if computer systems were not surrounded any longer by an environment of everyday languages. This environment, however, since a famous and twofold Greek invention, consists of letters and coins, of books and bucks.4 For these good economical reasons, nobody seems to have inherited the humility of Alan Turing, who, in the stone age of computing, preferred to read his machine's output in hexadecimal numbers rather than in decimal ones.5 On the contrary, the so-called philosophy of the computer community tends to systematically obscure hardware by software, electronic signifiers by interfaces between formal and everyday languages. In all philanthropic sincerity, high-level programming manuals caution against the psychopathological risks of writing assembler code.6 In all friendliness, "BIOS services" are currently defined as "hid[ing] the details of controlling the underlying hardware from your program."7 Consequently, in a perfect gradualism, DOS services would hide the BIOS, WordPerfect the operating system, and so on and so on until, in the very last years, two fundamental changes in computer design (or DoD politics) have brought this secrecy system to its closure.
  + **Precisely because software** does not exist as a machine-independent faculty, software as a commercial or American medium insists all the more. Every license, every dongle, every trademark registered for WP as well as for WordPerfect prove the functionality of one-way functions. In the USA, notwithstanding all mathematical tradition, even a copyright claim for algorithms has recently succeeded. At most, finally, there has been, on the part of IBM, research on a mathematical formula that would enable them to measure the distance in complexity between an algorithm and its output
  + All physically feasible machines, in contrast, are limited by these parameters in their very code. The inability of Microsoft DOS to tell more than the first eight letters of a file name such as WordPerfect gives just a trivial or obsolete illustration of a problem that has provoked not only the ever-growing incompatibilities between the different generations of eight-bit, sixteen-bit and thirty-two-bit microprocessors, but also a near impossibility of digitizing the body of real numbers[13](http://www.ctheory.net/printer.aspx?id=74" \l "note%2013) formerly known as nature.
  + Precisely this maximal connectivity defines nonprogrammable systems, on the physical side, be they waves or beings. That is why these systems show polynomial growth rates in complexity and, consequently, why only computations done on nonprogrammable machines could keep up with them. In all evidence, this hypothetical but all too necessary type of machine would constitute sheer hardware, a physical device working amidst physical devices and subjected to the same bounded resources. Software in the usual sense of an ever-feasible abstraction would not exist any more.
* On Computable Numbers, Alan Turing
  + We may compare a man in the process of computing a real number to a machine which is only capable o f a finite number of conditions q 1: q 2 . ... . q I; which will be called " m-configurations " . The machine is supplied with a "tape " (the analogue oof paper ) running through it, and divided into sections (called "squares" ) each capable of bearing a "symbol" . At any moment there is just one square , say the r-th , bearing the symbol <2>(r ) which is "in the machine" . We may call this square the "scanned square " . The symbol on the scanned square may be called the " scanned symbol" . The "scanned symbol " is the only one of which the machin e is , s o t o speak , "directl y aware" . However , b y alterin g it s m-configu - ratio n th e machin e ca n effectivel y remembe r som e o f th e symbol s whic h i t ha s "seen " (scanned ) previously . Th e possibl e behaviou r o f th e machin e a t an y momen t i s determine d b y th e ra-configuration q n an d th e scanne d symbo l < S (r) . Thi s pai r q n , © (r) wil l b e calle d th e ' ' configuration'': thu s th e configuratio n determine s th e possibl e behaviou r o f th e machine
  + I f a t eac h stag e th e motio n o f a machin e (i n th e sens e o f § 1 ) i s completely determine d b y th e configuration , w e shal l cal l th e machin e a n "auto - mati c machine " (o r a-machine) .
  + “the behavior of the computer at any moment is determined by the symbols which he is observing, and his ‘state of mind’ at that moment.”
* Names:
* Marx, Karl. “Preface.” A Contribution to the Critique of Political Economy.
* Best, Stephen, and Sharon Marcus. “Surface Reading: An Introduction.”
* Hayles, N. Katherine. “Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis.”
* linfo.org, Plain Text Definition.
* Heidegger, Martin. “The Question Concerning Technology”
* Winner, Langdon. “Do Artifacts Have Politics?”
* Sontag, Susan. “Against Interpretation”
* Bush, Vannever. “As We May Think”
* Tagg, John. “The Archiving Machine”
* Vismann, Cornelia. “Files”
* Beckett, Samuel. “Krapp’s Last Tape”
* Weaver and Shannon. “Recent Contributions to the Mathematical Theory of Communication”
* McLuhan, Marshall. “The Medium is the Message”
* Haugeland, John. “Analog and Analog”
* Katz, Matthew. “Analog and Digital Representation”
* Kittler, Friedrich. “Gramophone, Film, Typewriter”
* Von Uexkull, Jakob. “A Foray into the Worlds of Animals and Humans”
* Losee, Robert. “A Discipline Independent Definition of Information”
* Bateson, Gregory. “A Re-examination of Bateson’s rule”
* Monkeys, “Notes towards the complete works of Shakespeare”
* Kittler, Friedrich. “There is no Software”
* Moye, William. “ENIAC: the army-sponsored revolution
* Turing, Alan. “On computable numbers”