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## HOW TO UNDERSTAND COMPUTER LOGIC

by  
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I would like to thank my wife, daughters, and sons on the motivation, editing, and marketing of this book. Family is so important, and I realize the blessings they provide me. Thank you Everlyne, Nicole, Keisha, Malcolm, and Jakobi. I love you all.

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## Chapter One

I have worked in the Information Technology field for over twenty-five years. I started out as a Computer operator and most recently accepted a five year, remote assignment as an Information Technology Project Manager consultant. As you read this book, my hope is you will begin to see a clear path for you to begin a career as an Information Technology consultant.

Information Technology roles I have held, include COBOL programmer (developer/coder), Documentation author, Metrics owner, Requirements lead, Project manager, Senior Business analyst, and any combination of the previous.

Logic is the one thing I look to perform my roles. Once you understand logic, all else becomes easier.

My educational degrees include: Associates of Science in Data Processing, Bachelor of Science in Computer Information Systems, Master of Arts in Teaching Educational Technology, and Master of Business Administration. I am also Scrum Master certified. Certifications are a great way to learn many different skills. I will share more on this, soon.

The college courses that seemed to help me most, were: Logic and Philosophy, Algebra, Flowcharting, and the focused Computer Information System curriculum. All of these topics can be researched using the internet.

This book attempts to share my experience with working in the Information Technology field, and more specifically:

logic. Also shared are tips and information to understand logic and how it relates to Information Technology and computers. Later chapters offer study/internet research tips, motivation to study for a new career, and explain the psychologies of entering into a new Information Technology role. This is a resource to begin researching a career in Information Technology.

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Type of book is "Educational Information Technology Logic."

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## Chapter Two

Computers are machines, made up of circuits. Computers also have storage capability, a central processing unit, input devices (mouse/keyboard/etc.), and monitor (or other peripherals). The circuits are what we will discuss in this chapter.

Computers can do nothing without humans giving them instructions. Users are people that use computers. Computers follow instructions written for them, called code/programs/scripts. Programmers (sometimes called coders or developers) are people who write the instructions computers follow. Computers process instructions (also called programs, computer code) at an extremely high speed.

Either a circuit's electric power is on, which is represented as a one (1), or the circuit's electric power is off, represented as a zero (0). These circuits patterns (either electric on or electric off) combine to create variables, constants, counters, rules, instructions, words, sentences, whole programs, and most importantly: logic. The on and off states can be used to assign 'True' and 'False' (for example) values to 'IF' statement processing. More information on these statements later.

Programs are what computers interpret, to perform instructions. Most programs begin with teaching people how to send a message to the screen, similar to: "HELLO WORLD". Computer languages are like foreign languages, having verbs

and nouns; and are easy to learn if you put the time in. If you enter the correct language syntax, you will have a successful running program. Languages have special programs (compilers) that stop computer processing and points out any mistakes. Mistakes (bugs) must be eliminated so the program can be rerun. A program may be successful if it completes with no error messages. Sometimes no error message is received, but the results are not what was expected. These are logic errors that compilers cannot detect. The one thing a language cannot teach you is the logic. After reading this book, you will be able to understand computer logic, how to use it in programming and design, and how to begin learning to begin a career in Information Technology.

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### Chapter Three

Computers need instructions to process or run a program. These instructions (computer programs) direct the computer to a desired outcome. The goal is to logically arrive at a desired outcome, decided by some user, manager, or customer.

Starting at the beginning of the logical process is the INPUT of a desired outcome. Input can be a data file or it can be a stimulus. Think of a stimulus as some action that takes place. Clicking a SUBMIT button is an example of a stimulus. Instructions are capture in the button, and are executed after the button is pressed. Examples follow that initiate computer instructions:

- \* The cursor reaches a specified position on the computer screen
- \* A counter (accumulator) reaches a desired amount
- \* An email arriving
- \* The cursor entering into an address field
- \* The selection of the state you live in
- \* Creation of a file of customer information

The input starts everything off. Otherwise computer programs just sit in memory. Think about how you search for a word at Dictionary.com. You INPUT a word, Dictionary.com finds its matching definition (PROCESS), and the OUTPUT is presented for the user to understand. This is the same logical pattern, throughout these writings: INPUT, PROCESS, OUTPUT.

Input is important to understand and identify, in order to logically transform it into the output desired. Again, input may be a physical file or request, but many times it is a click of the mouse or arrival of an email, or some other stimulus. Begin the logical process with understanding the input. Do you have the correct input to produce the desired output? Before diving into computer instructions, the input needs to be understood and identified.

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## Chapter Four

The next step, and maybe most important step to logically producing computer output, is the Process phase. This phase is where the logic takes the input and produces the output.

Example 1: A file of names, addresses, city, state, and zip codes has been identified as the input. The output desired is in the format: Name and zip code. The instruction would read similar to: Read a record (files are made up of records), IF it is a name or zip code, provide it for the output. We will talk about outputs in the next chapter.

Example 2: Input as a stimuli (mouse clicks) are tested against per-defined rules. When a button is clicked, the process begins and reads the instructions associated with that click. This is evident when entering your name and other information, then clicking the submit button. The name and other information on the form/screen are the input. When the mouse is clicked, that initiates the instructions. The instructions tell the computer to enter the incoming information as pre-described. Someone made a decision to manipulate the incoming data in a certain way. The user will not see or know this, but the data is manipulated and transformed into output or some desired result. This desired result has been coded into the program.

Example 3: When the mouse button clicks, accept the data, store it, and provide this output message. The user

clicks a button after entering the information, the screen refreshes with a message that was created and stored in the instructions.

The IF/THEN?ELSE statements are very powerful, and understanding them is understanding logic. Remember, computers read instructions as zeros and ones. Zero is off/false/no, and one is on/true/yes. If a variable is defined with a value of zero, a test can decide the actions to take. Example 4: IF Variable = 0, THEN do this, ELSE do that. There are several combinations involving these type logic tests. This is a tip to coding logical instructions.

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## Chapter Five

The Output phase is decided before computer instructions are completed. Forethought has to be used to create alerts and messages for users to understand what is happening with the computer. These alerts and messages include:

Loading/You've got mail/Thank you/etc. Messages and wave (sound) files are methods the computer can send easily.

Programmers keep the users in mind, when they code instructions and any associated messages. Users must be updated and aware of what they can do next.

Thinking like a computer programmer means understanding how to communicate to computer users. Thinking like a servant, and thinking logically will also help programmers communicate with users.

Begin with the end, in mind. The output is one of the first things to design. Is it a file or is it an action? If it is a file, what format or order is desired? If it is an action, how is the action initiated? Once the output method has been decided, a placeholder (or stub) process can be created to test the output method. Send output to test files, first, to ensure data is correct. Expected actions can be reviewed in a testing environment. After all testing is done, and the desired output is produced, programmers run the code in a production environment. The production environment is the environment all computer users access. Begin with the end in mind. What is desired of the output?

It is best to know where you are going, so you will know when  
you arrive.

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## Chapter Six

To make the best out of your Information Technology studies, use Google.com and YouTube.com to research any words and terms you are unfamiliar with. A good practice to continue with is to look in the dictionary or google ANY word you are not familiar with. DO NOT skip over a word and try to figure out what it means by reading the associate content.

Spend time researching, reading, and understanding Information Technology. Allocate a little time to study each day and you will realize. Thirty minutes a day can add up to mastering a new skill, if the study is consistent.

Online classes and certifications are great ways to learn new skills. Coursera.com, Udemy.com, and just a search on online certifications or courses will provide a long list of certifications and courses anyone can purchase and attend. Certifications prove that a focused learning process has taken place. The one thing that certifications and online courses do not provide is experience. Certifications and classes offer content learning, but this is no substitute for actually doing the work. Don't make the mistake of thinking online certifications is equal to work experience. There are many scenarios and problems that can arise (in a work environment), that are not mentioned in online training. It is best to stay humble when sharing about your certifications.

## Chapter Seven

Once hired into an Information Technology role, new persons need to be aware of the competitiveness and other threats. If it is found a person cannot do the role, they can be immediately released. Do not lie on resumes, cover letters, or interviews.

The Hiring manger and interviewers generally want you to succeed, once you pass their questions. Everyone else seem to fit into a few categories (as noticed by the author).

Most data shop resources want to see a new person succeed. Watch out for the court jester. This person will hang around you and tell jokes all day. My solution was to not laugh (when really not funny) and say something similar to: "Hey, I need to get back to work...". No other explanation needed, and the next action should be to turn to your work.

Each company's data shop is completely different. The same role (developer, tester, project manger, etc.) Are completely different per assignment.

The psychology of mankind many times allow politics, prejudices, and other devious tactics to play out on unsuspecting entry level resources. This is a reality new resources must stay aware of. That person wanting to tell you jokes all day, may want to see you laughing and fired. It is very competitive in Information Technology field. Someone's reputation could be ruined, if word gets out they

could not perform well. It is unfair, but be prepared to leave an assignment, if no other options exists to protect your reputation.

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## Chapter Eight

Preparation and maintenance of your resume, cover letters, and interview lessons learned are very important. Never lie on or in any of there opportunities. Resumes and cover letters should be developed with intent and serious thought. Each person will need to concentrate and express them selves in these documents.

Interviews, however, offer very creative opportunities to get hired.

THE END