MADDIE BARBER

ACCOUNTING AND COMPUTER SCIENCE

How we can answer our essential questions in the context of accounting

WHAT IS A COMPUTER?

SHORT ANSWER:

If we go back to the original definition, a computer is simply someone or something that makes calculations. When it comes to accounting, the most used computer is the accountant themselves. Other examples of computers are typically electronics or programs in computers.

LONG ANSWER:

While the accountant could be classified as the main computer, there are many tools utilized by accountants that are computers in their own right. Some examples are tax software, Enterprise Resource Planning systems (like QuickBooks), Excel spreadsheets, physical calculators, and various proprietary programs across firms and companies.

These other computers are great tools that can help accountants to do their jobs in an accurate and more timely manner than if they were to do all of the calculations themselves by hand.
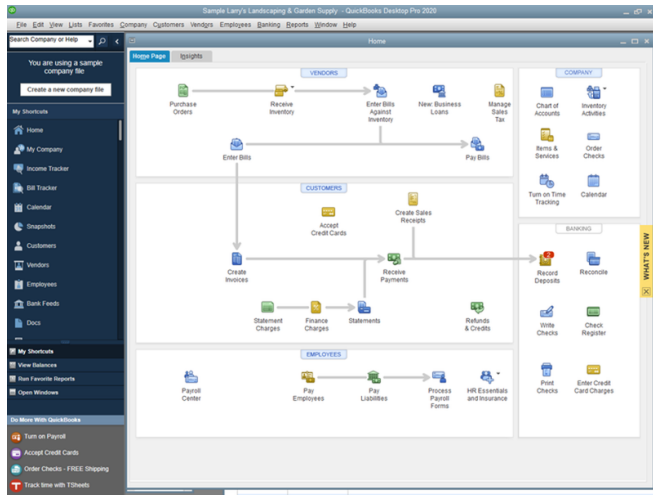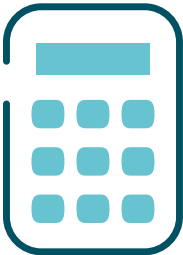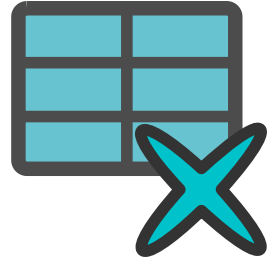
Effective-Interest Method—Semiannual Interest Payments
5-Year, 8% Bonds Sold to Yield 10%

Date	Cash Paid	Interest Expense	Discount Amortized	Carrying Amount of Bonds
1/1/20				$ 92,278
7/1/20	$ 4,000[a]	$ 4,614[b]	$ 614[c]	92,892[d]
1/1/21	4,000	4,645	645	93,537
7/1/21	4,000	4,677	677	94,214
1/1/22	4,000	4,711	711	94,925
7/1/22	4,000	4,746	746	95,671
1/1/23	4,000	4,783	783	96,454
7/1/23	4,000	4,823	823	97,277
1/1/24	4,000	4,864	864	98,141
7/1/24	4,000	4,907	907	99,048
1/1/25	4,000	4,952	952	100,000
	$40,000	$47,722	$7,722	

[a] $4,000 = \$100,000 \times .08 \times {}^6/_{12}$

[b] $4,614 = \$92,278 \times .10 \times {}^6/_{12}$

[c] $614 = \$4,614 - \$4,000$

[d] $92,892 = \$92,278 + \$614$

	Book (dr) cr	Adjustments (dr)	cr	Tax (dr) cr	Permanent or Temporary?	Favorable or Unfavorable?
Net Income per Books	174,100			174,100		*credit adjustments are unfavorable*
Federal Tax Expense	(86,600)		86,600	-	Permanent	Unfavorable
Tax Exempt Interest Income	4,500	(4,500)		-	Permanent	Favorable
Excess Depreciation	(x)	(7,200)		x+7200	Temporary	Favorable
Net Capital Loss	(9,400)		9,400	-	Temporary	Unfavorable (this year)
Nondeductible Meals and Entertainment	(5,500)		5,500	-	Permanent	Unfavorable
Interest on Loan to Buy Tax Exempt Bonds	(1,100)		1,100	-	Permanent	Unfavorable
		(11,700)	102,600			
Charitable Contributions	(40,000)		13,500	(26,500)	Temporary	Unfavorable (this year)
Dividends Received Deduction (DRD)	-	(10,000)		(10,000)	Permanent	Favorable
		(21,700)	116,100			

Taxable Income before charitable contribution deduction and the DRD is:

$174,100 (book income) - $11,700 (favorable differences) + $102,600 (unfavorable differences)

$	265,000	Taxable Income before special deductions
$	26,500	charitable contribution deductions are limited to 10% of taxable income before special deductions
$	238,500	Taxable income before DRD, received $20,000 in dividends

HOW DO WE USE ALGORITHMS IN OUR LIVES?

SHORT ANSWER:

Algorithms are used in accounting to solve all kinds of problems. Instead of referring to them as algorithms though, they are more often called formulas. These formulas can be used for things as simple as finding net income or for things as complex as bond amortization.

LONG ANSWER:

It is hard to think of situations in accounting that don't require formulas in some capacity. These formulas can involve just addition and subtraction, or they can require complex tables and calculations.

There are also many calculations that seem simple , like computing tax liability, that require knowledge of the tax laws to know what should be included in the calculation and what should not be.

DO HUMANS CREATE OR DISCOVER ALGORITHMS?

Straight-Line Method Example

$$\frac{(Cost - Salvage\ value)}{years\ of\ useful\ life} = Depreciation\ per\ year$$

$$\frac{(30,000 - 500)}{5} = \$5,900$$

		Accumulated Dep.
Year 1 Depreciation:	$ 5,900	5,900
Year 2 Depreciation:	5,900	11,800
Year 3 Depreciation:	5,900	17,700
Year 4 Depreciation:	5,900	23,600
Year 5 Depreciation:	5,900	29,500

FIFO

First-in, First out (FIFO) assumes that the first inventory purchased is the first to be sold.

1	2	3
$30	$31	$32
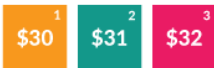
The business deducts the cost of the first unit ($30) to arrive at $10 taxable income

Weighted-Average Cost

Average cost assumes that the cost of the units sold in any given year is the weighted-average cost of the available inventories for sale that year.

$30, $31, $32
Average = $31

The business deducts the average cost of all three units ($31) to arrive at $9 taxable income

LIFO

Last-in, First-out (LIFO) assumes that the last inventory purchased is the first to be sold.

3	2	1
$32	$31	$30
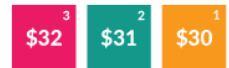
The business deducts the cost of the last unit ($32) to arrive at $8 taxable income

SHORT ANSWER:

In accounting, I would say that most algorithms used are created. Many algorithms are based off of rules and regulations from various agencies, including the IRS, the FASB, and the AICPA.

LONG ANSWER:

While some accounting algorithms are fairly intuitive, many are not. One that I would say is intuitive is the calculation for straight-line depreciation. I would not say that the methods and calculations for overhead allocation are.

Because there are sometimes different methods that can be used for the same purpose, like LIFO and FIFO for inventory, I would say that algorithms are more created in accounting than discovered. There are many ways to do things, and different methods can be used depending on the situation.

HOW HAS THE WIDESPREAD USE OF COMPUTING TECHNOLOGY AND ALGORITHMS CHANGED THE WAY WE WORK, PLAY, AND INTERACT WITH OTHER PEOPLE? HOW MUCH SHOULD WE LET TECHNOLOGY DO FOR US?

SHORT ANSWER:

Computing technology and algorithms have undoubtedly made accounting faster and easier for those who may not have felt as comfortable with it before. It has also changed the way that accountants meet with their clients, providing flexibility that did not previously exist.

IS IT TAX DEDUCTIBLE? DOES THIS QUALIFY FOR A SPECIFIC TREATMENT?

???

LONG ANSWER:

While various programs and software have made accounting more streamlined, there are still things that accountants can do that this technology cannot do. There are many judgement calls that must be made in accounting, and they are still better made by a human than a machine.

I think that these programs are useful tools for accountants, but I also think that the outputs from these programs should at least be reviewed by accountants to ensure that they are working correctly. To solely rely on these programs would not be the wisest decision, and I believe this is why accountants remain in demand in the current, technology-heavy work environment.

BOOKKEEPER
• Maintains general ledger
• Pays bills
• Tracks income and expenses
• Reconciles accounts
• Keeps track of money in and money out
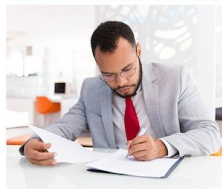
ACCOUNTANT
• Reviews financial information
• Analyzes accounts
• Provides insight about finances
• Prepares budgets and reports

CPA
• Provides business advice based on financial data
• Advises on taxes, financial data
• Creates financial strategies to maximize profits and minimize expenses

SHORT ANSWER:

There are a few issues that have arisen in accounting as a result of the widespread use of technology. Two of the largest among them are data security and job security.

LONG ANSWER:

Because so much financial information is now kept online, there is always a cybersecurity threat looming. There is also the chance that data is lost by whatever system it is being stored in.

The main issue facing accountants specifically is job security. While it is not currently possible or wise to rely only on the technology, there is a chance that algorithms and artificial intelligence may become enough at some point on their own. Right now, I do not see this happening very soon; however, it is something to be aware of as technology continues to develop.

WHAT SOCIAL AND LEGAL ISSUES HAVE ARISEN DUE TO THE WIDESPREAD USE OF COMPUTING TECHNOLOGY AND ALGORITHMS? WHAT NEW ISSUES ARE LIKELY TO ARISE IN THE FUTURE?