User Friendly

IN THIS ISSUE

DATA PRIVACY DAY

January 28, 2019

STOP. THINK. CONNECT

Https://staysafeonline.org/data-privacy-day

Ctrl-Click on this icon to see our Meetup Page.

Ctrl-Click on this icon to follow us on Twitter.

Member of

apcug

An International Association of Technology & Computer User Groups

www.apcug2.org
www.facebook.com/APCUG
www.twitter.com/apcug
www.youtube.com/apcugvideos

JANUARY 8 GENERAL MEETING

Topic: **Digital Literacy with Techboomers**
Speaker: **Kay Fleury,** Content Manager & SEO Specialist, https://techboomers.com/

This presentation is about Techboomers.com, a free educational website that teaches casual technology users, older adults, tech teachers, and other internet users how to enjoy using websites, apps, and devices. We aim to improve everyday life by teaching people about great new sites and services online. We focus on how to recognize the dangers of the internet and how to be safe online. You learn about digital literacy, best practices, and many good websites.

We love sharing this knowledge with as many people as possible. Our tutorials and articles are free to use and distribute in any way you like! You may use them for SIG or general meetings, to teach classes at your work place or institution, or even turn our tutorials into PowerPoint presentations.

Meet Our Presenter

Kay Fleury is the Content Manager for Techboomers. She earned Masters' degrees in both English and History from Wilfrid Laurier University, Waterloo, Ontario, Canada. She joined Techboomers in 2016.Then it mostly offered free online courses for popular websites and apps. She has written numerous individual articles, guides and tutorials that teach everything one needs to know about a topic. Kay works closely with founder and CEO Steve Black to ensure the materials available are up-to-date and of the highest quality. Using Search Engine Optimization and other online marketing strategies, Kay helps make Techboomers a place where any level of learner can arrive and learn digital literacy, online safety, and how the websites and apps they want to use work.

When she's not working for Techboomers, Kay often plays her guitar, tries a new video game, or plans her next 20 trips.

Tuesday, January 8, 2019, 7:30 - 9:00 PM
Westchester United Methodist Church, Fellowship Hall
8065 Emerson Ave., Westchester, L.A. 90045
An informal Computer Q & A Roundtable meets from
6:30 to 7:20 to answer individual questions.
Refreshments and socializing at **7:00**
More info: www.lacspc.org
or at 310-398-0366

FROM YOUR PRESIDENT

I can't believe it is already 2019, and that I am the president of LACS! How did that happen?

- When I first joined LACS more than 20 years ago, I barely knew how to turn on a computer. It's incredible how much has changed in that time. I don't think I would ever have been able to keep up without LACS. Now, besides learning how to perform useful tasks on the computer, and how to solve problems, we are branching out into other areas of technology.

- LACS is about learning and exchanging ideas. We learn at every general meeting, SIG meeting, and from our volunteer activities. I have learned a lot by being editor. When I became editor, I had never used Publisher. I know that I now have a lot more to learn.

- I will be dependent on the members in working to keep LACS a living, breathing organization. It is a volunteer - driven service and social organization. As such, we need input and help from every member. Please tell me what you would like to see LACS do. What will keep you coming back? I look forward to working with all members.

- There are some specific opportunities for service at present. These include help with our greeter's and refreshment tables at the general meetings. More volunteers are needed to monitor the Culver City Senior Center open computer lab. We are short one director. It would be nice if our members wrote articles for *User Friendly* or suggested topics for articles or presentations. Please contact me if you think you may fit in one of these positions or if you have any questions.

The Editor of *User Friendly* accepts most contributions of any suitable length from members. Send articles to editor (at) lacspc.org in an email message or as a Word document by the **20th of the month.**

A Happy, Healthy Prosperous 2019 for All LACS Members.

I recently read a quote from comedian Tina Fey.

"Say yes and you'll figure it out afterwards."

I think that's what I did when I agreed to be editor!

I plan to publish a new roster in the February or March issue. Please let me know if you have any changes in your contact information, or if you have any preferences on how you want to be listed.

SOME SOURCES OF COMPUTER INFORMATION

The APCUG website at https://apcug2.org
   Tips for Windows, Apple, Linux and Chromebook users

Jim McKnight's website at
   http://www.jimopi.net
   How-to guides collected from years of working with computers

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Contest

A copy of this icon is somewhere in this issue. If you find it, send an email with your name and the page number to <editor (at) lacspc.org>. The 1st two received each month may win a small prize. Proofreaders and board members are not eligible. The same person won't receive more than 2 prizes.

Congratulations to Hedy Zhang for finding the icon in the November and December issues.

GENERAL MEETING REPORT
December 11, 2018

By **Leah Clark**, LACS Editor
Holiday Potluck Dinner Party

Our holiday potluck dinner party got off to a rocky start. The 405 freeway was closed because someone was threatening to jump from an overpass, resulting in all the surface streets being jammed. This caused almost everyone to arrive late, including me. When I finally got there with all the table settings, decorations, coffee service, etc. everyone jumped in. Within minutes the tables were set, and the food was laid out. What a great bunch of people LACS members are!

There were about 40 members and guests present. They brought a wide range of salads, entrees, side dishes, and delicious desserts. Everyone relaxed, ate their full, and then more. A good time was had eating, chatting, and getting better acquainted. We celebrated the good times in LACS.
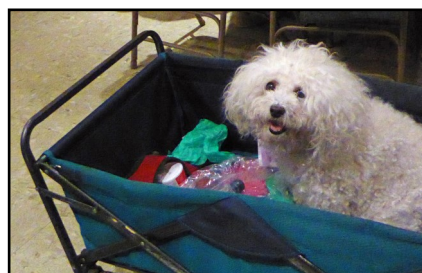
A special guest

FINANCIAL SOFTWARE

By **Dick Maybach**
Brookdale Computer Users Group, NJ
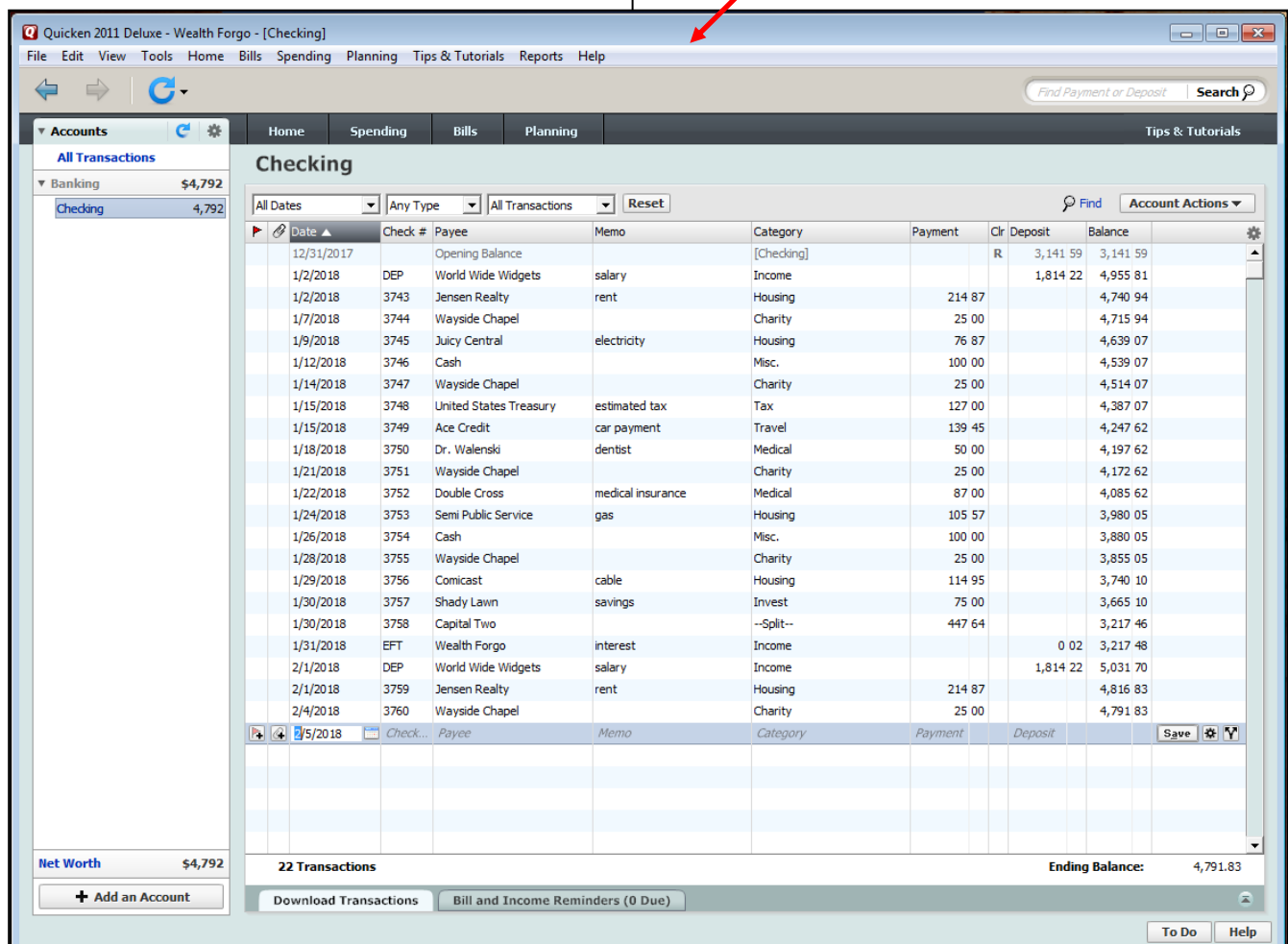BCUG Bytes, August 2018
www.bcug.com
n2nd (at) att.net

I, like many others, have used Quicken for years to manage our family finances. In 2015 Intuit sold it, and the new owner has recently decided to make it a subscription product, requiring users to make periodic payments. So far, Intuit continues to support versions before 2015, and you can use these with no added fees. However, if you purchase a new PC, you may not be able to install your existing Quicken on it. What are the alternatives?

I use the software only for our checking account and enter all the data into it manually; moreover, I don't use it to transfer funds electronically. Although TurboTax can import data directly from Quicken, I don't use this feature either. As a result, I have considerable flexibility in choosing a program. I evaluated accounting programs by importing our data from Quicken and using them in parallel with Quicken for several months.

During this time, I entered the new checks and deposits, reconciled the account, and prepared reports. This let me check that the programs would do what I need and compare the efforts required. If you've used Quicken for many years, you will find any new program quite awkward at first. A fair trial requires considerable study of the documentation and should extend over several weeks.

There are dozens of financial programs available, and I selected two of these for evaluation, **GnuCash** (http://www.gnucash.org/) and **HomeBank** (http://homebank.free.fr/en/). Both are free and run on Windows, OS X, and Linux. I'll illustrate their characters by using a simple example checkbook record imported from Quicken, shown in **Screen 1**.

Quicken uses single-entry book-keeping, where there is only one account, and the deposits and withdrawals are assigned to categories (income, housing, charity, etc.) Note the first entry (Opening balance). A Quicken feature allows you to close out an account, for example at year's end. Items prior to the closeout date are placed in a separate file and deleted from the current one.

HomeBank, like Quicken, uses single-entry book-keeping, and while this is easy for most home users to understand, it isn't really suited to business use. Importing the Quicken data resulted in two accounts, one representing the opening balance in Quicken and the other the subsequent transactions. The opening balance account can't be deleted, but it can be hidden. Doing this and renaming the other resulted in **Screen 2**.

From here you see a graphical summary of your spending, configure the program, select reports, and set up budgets. Double-click on an account to see the transactions, **Screen 3**, page 6.

Screen 2. HomeBank Summary
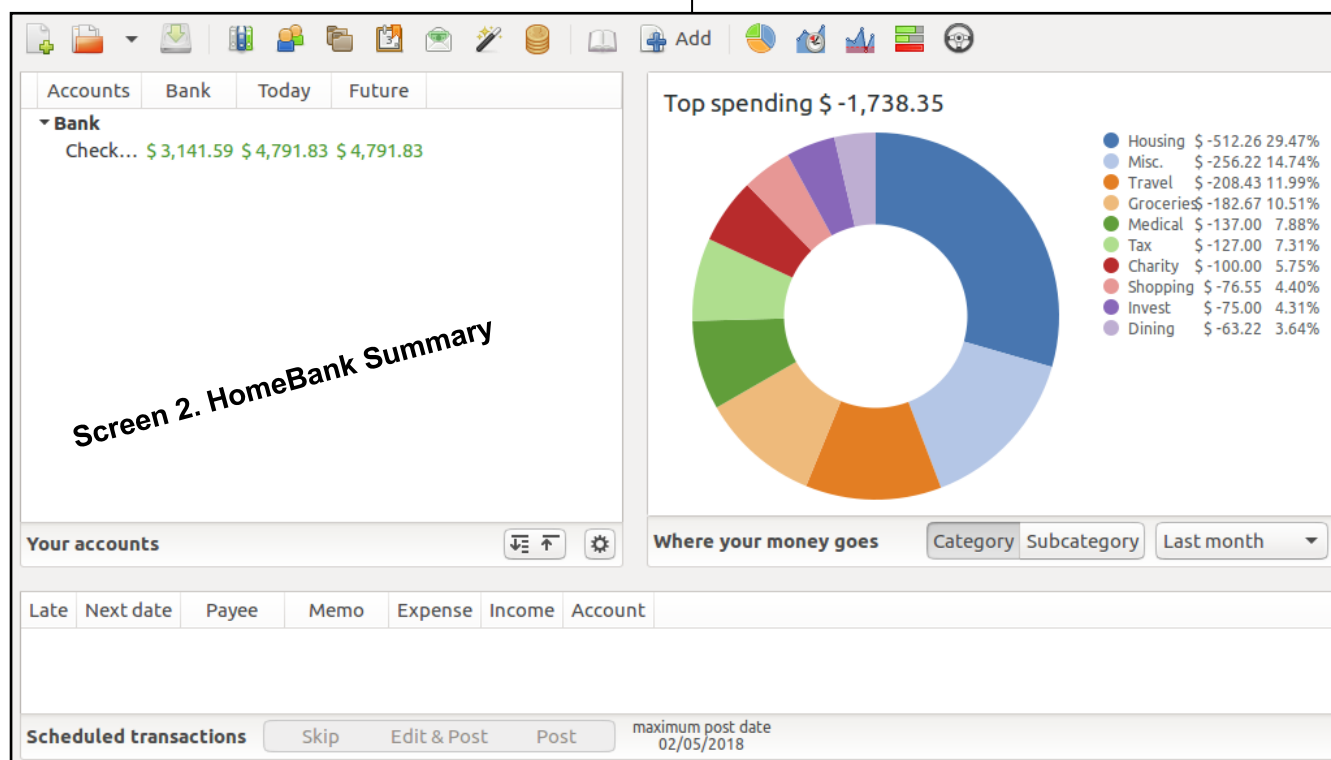
Unlike Quicken, HomeBank has no separate screen to reconcile an account. Instead, you select a transaction that appears on your bank statement and click the green check icon in the lower menu bar, after which a green check mark will appear in the Status column. The Bank item in the header shows the account balance of all the cleared items. When it equals the closing balance on your bank statement, the account has been reconciled. Click the *Add* icon in the lower menu bar to add a transaction or double-click on one to edit it; the result is **Screen 4,** page 6**.**

Although HomeBank is simple and easy to use, I found it somewhat more cumbersome than Quicken, in that entering transactions required a few more keystrokes. There also are no provisions for online banking. The F1 key opens the on-line manual, which of course requires internet access. HomeBank can import QIF, QFX, and CSV files, and can export QIF ones. Thus, if you find after using it for a while that it isn't suitable, you can move your data to another program.

If HomeBank doesn't meet your needs, you might consider the more complex **GnuCash**. It uses double-entry accounting, which makes it suitable for business use and for organizations who are subject to audit. It includes features for asset management and on-line banking. Its home screen, shown in **Screen 5**, page 7, hints at its double-entry approach.

Checking			Bank: $3,141.59	Today: $4,791.83	Future: $4,791.83		Q Search...	

Range: Last 12 months ▾	Type: Any Type ▾	Status: Any Status ▾	Reset filters	22 items (1 selected $3,141.59)

Date ▲	Info	Payee	Category	Status	Expense	Income	Balance	Memo
12/31/2017		Beginning Balance		✓		$3,141.59	$3,141.59	
01/02/2018		World Wide Widgets	Income			$1,814.22	$4,955.81	salary
01/02/2018	3743	Jensen Realty	Housing		$-214.87		$4,740.94	rent
01/07/2018	3744	Wayside Chapel	Charity		$-25.00		$4,715.94	
01/09/2018	3745	Juicy Central	Housing		$-76.87		$4,639.07	electricity
01/12/2018	3746	Cash	Misc.		$-100.00		$4,539.07	
01/14/2018	3747	Wayside Chapel	Charity		$-25.00		$4,514.07	
01/15/2018	3748	United States Treasury	Tax		$-127.00		$4,387.07	estimated tax
01/15/2018	3749	Ace Credit	Travel		$-139.45		$4,247.62	car payment
01/18/2018	3750	Dr. Walenski	Medical		$-50.00		$4,197.62	dentist
01/21/2018	3751	Wayside Chapel	Charity		$-25.00		$4,172.62	
01/22/2018	3752	Double Cross	Medical		$-87.00		$4,085.62	medical insurance
01/24/2018	3753	Semi Public Service	Housing		$-105.57		$3,980.05	gas
01/26/2018	3754	Cash	Misc.		$-100.00		$3,880.05	
01/28/2018	3755	Wayside Chapel	Charity		$-25.00		$3,855.05	
01/29/2018	3756	Comicast	Housing		$-114.95		$3,740.10	cable
01/30/2018	3757	Shady Lawn	Invest		$-75.00		$3,665.10	savings
01/30/2018	3758	Capital Two	- split -		$-447.64		$3,217.46	
01/31/2018		Wealth Forgo	Income			$0.02	$3,217.48	interest
02/01/2018		World Wide Widgets	Income			$1,814.22	$5,031.70	salary
02/01/2018	3759	Jensen Realty	Housing		$-214.87		$4,816.83	rent
02/04/2018	3760	Wayside Chapel	Charity		$-25.00		$4,791.83	

➕ Add	🗐 Inherit	📝 Edit	✓	✓	📝	📄	⊗		🔽 Filter	⚗

Screen 3. HomeBank Account View

Date:	02/04/2018 ▾
Amount:	% -25.00 − + 🔁
Payment:	(none) ▾
Info:	3760
Account:	Checking ▾
Payee:	Wayside Chapel ▾
Category:	Charity ▾
Status:	None Cleared Reconciled Remind
Memo:	
Tags:	
	Cancel OK

**Screen 4. HomeBank Transaction
Edit Window**

Unlike in Quicken, there are no categories; instead, there are multiple accounts. Checking accounts are essentially the same as in single-entry systems; the others take similar roles to categories. When you write a check to a charity, you deduct from the checking account and add to charity account. There is thus a plus for every minus, hence the term, "balancing the books." Note the Retained Earnings account, which is the account's opening balance. (GnuCash handled this more gracefully than HomeBank.) Double-clicking on the checking account shows its transactions, **Screen 6**, page 17.

We see mostly the same information as with HomeBank and Quicken. A nice feature is that selecting a split transaction (*Capital Two* on screen 6) displays its component transactions. Like Quicken, GnuCash has a reconciliation feature, which leads you through the process, **Screen 7,** page 17.

Save Close					
Accounts					
Account Name ▲	Description	Total			↓
🏛 Charity		$125.00			
🏛 Checking		$4,791.83			
🏛 Clothing		$76.55			
🏛 Dining		$63.22			
▼ 🏛 Equity		$3,141.59			
🏛 Retained Earnings		$3,141.59			
🏛 Groceries		$182.67			
🏛 Housing		$727.13			
🏛 Income		$3,628.46			
🏛 Invest		$75.00			
🏛 Medical		$137.00			
🏛 Misc.		$256.22			
🏛 Tax		$127.00			
🏛 Travel		$208.43			
$, Grand Total:	Net Assets: $4,791.83		Profits: $1,650.24		

Screen 5. GnuCash Home

If you've had no exposure to accounting, it will take some time to adapt to the double-entry system, although it's briefly explained in the tutorial on their website. For example, unlike in Quicken, when using GnuCash, once you've reconciled a transaction you shouldn't change it. If you find an error in a reconciled transaction, you enter a separate transaction to make the correction. Once I became acquainted with GnuCash, I found it quite easy to use, although entering transactions is slightly more cumbersome than with Quicken.

A peculiarity worth mentioning is that while GnuCash can import data files in several formats, including QIF, QFX, and CSV, it can export only in CSV. Many programs, including Quicken, can import only QIF files. Software is available to convert CSV files to QIF, but it involves additional work (and additional chances for mischief), especially since Quicken is fussy about the flavor of QIF. Another caution is that all the discussion I've seen on importing is for Intuit's versions of Quicken; I don't know if there are problems with the new one.

A bonus GnuCash feature is that it has a companion Android app that can export data to the PC program. You can use **Android GnuCash** to track credit and debit card transactions, and if you have the device with you, you know the card balances as you make the transactions. When you get a statement, you export the data to the PC and reconcile the account. Now your records show the card transactions as well as the checks. It will take some time and effort to learn to make this work, as reconciliation involves both the bank and card accounts and hence is a little tricky.

GnuCash's advantages made mastering its double-entry basis worth the effort for me. Much of my spending is via credit and debit card transactions, which are now automatically included in my records. I also find the GnuCash reports to be more helpful than Quicken's when preparing my tax return. It takes slightly longer to enter each check, but being able to import card transactions from Android balances this.

Although I test-drove these two programs by importing data from Quicken, this may not be the best strategy to make the change. The import process isn't perfect and may result in artifacts

LACS NOTICES

WELCOME ALL

**George Wolkon,** LACS Database Manager

New Members (1)
  Ron LeBlanc

Renewals (11)

Melvin Gaines	Mark Presky
Alan Greenberg	E. J. Rozek
Leonardo Israeli	Maurice Stephenson
Jack McGruder*	Julia Sumpton
Jim McKnight	Hedy Zhang
Penelope McKnight	*Contributor

JOIN OUR MAIL LISTS

All you have to do to join our lists is send your name only in the message body of an email to lacspc-subscribe@yahoogroups.com.

and to lacslist-subscribe@yahoogroups .com

These lists are for members only.

Lacspc is for official LACS business.

Lacslist is for any other computer-related messages and questions. If you have question about the lists, please contact our "Mail Guy" at mailportal (at) lacspc.org.

LACS IS ON TWITTER

On **Twitter**, follow us at:
https://twitter.com/LA_CompSoc
Click on the above link, or go to the URL, to see what's there.

REVIEWS

Your editor wants to publish members' reviews of things they like or don't like. Your opinions about software, hardware, books, and other technology could be very useful to other members. Articles can be edited for grammar and spelling - only the content is important. Thanks!

FIX YOUR PC FOR FREE?

Jim McKnight has an open offer to all LACS members to diagnose, repair, disinfect, or upgrade members' PC's for free.
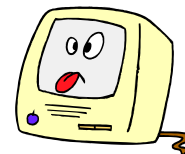
There are certain limitations to Jim's offer, so see the details by clicking the "Fix my PC for Free?" link at www.jimopi.net.

Non-members can wisely invest in a one-year new Regular LACS membership ($40.00), and Jim will fix your PC problem, too. Contact Jim for specific considerations.

HOW TO CHANGE YOUR CONTACT INFORMATION

Go to www.lacspc.org. Click on **Member Forms** in the bar under the picture. Under **Membership Update,** select **Click Here** to select either the DOC or PDF form. Fill it out and bring it to a meeting, mail it, or email your changes to membership@lacspc.org.

LACS HAS JOINED MEETUP

Our Meetup group is called:
"*Los Angeles Computer Society and Technology Meetup*."

Please join and **RSVP** for our general meetings - it's free. Go to http://www.meetup.com/Los-Angeles-Computer-Society-and-Technology-Meetup/
and click on **"Join Us."**

If others see that a lot of people are interested, they will be encouraged to join LACS. We hope this will result in new members.

LACS Website

www.lacspc.org posts back copies of the color version of *User Friendly*, calendar information, and podcasts of most of our general meetings. There is also a biannual index to past issues on the website. Check the menu on the right side.

LACS CALENDAR

General Meeting
Date: Tuesday, January 8, 2019
Time: 7:30 P.M.
Where: Westchester United Methodist Church, Fellowship Hall.
8065 Emerson Ave. Westchester, L.A. 90045

LACS Board Meeting
Date: Tuesday, January 29.
Time: 7:00 P.M.
Where: At the home of Charlotte Semple
Contact a board member for address.
LACS members in good standing may attend.

No Special Interest Group (SIG) meeting is scheduled for January.
New SIGs can be created if there is sufficient interest and leadership.
Please contact the board to make your wishes known, or to offer ideas or help.

January 1: New Year's Day
January 21: Martin Luther King Jr. Day

Ride Sharing
If you need a ride to a General Meeting, or if you are able to give a ride, please contact Freda Sanders at 323-230-3278.

GENERAL MEETING PRESENTATIONS

January 8   Techboomers.com
February 12 Computer Gaming
March 12   How to Get Better Google Search Results

Note: This schedule is subject to change. Check e-mail, *User Friendly* and our website for updates, but mark your calendar now.

PODCASTS
Listen to the podcasts of our general meetings. Go to http://www.lacspc.org/category/audio-files/. Click on the session you want to hear.

USER FRIENDLY BACK ISSUES
To see back issues of *User Friendly,* go to http://www.lacspc.org/category/user-friendly/. For indexes, go to https://www.lacspc.org/category/uf-index/

GENERAL MEETING SNACK SCHEDULE
By **Sylvia Q. Davis** Hospitality Chair

Refreshments and socializing will be at **7:00**. The meeting starts at **7:30**. Please bring refreshments at **7:00.**

January 8	A through D
February 12	E through I
March 12	J through N
April 9	O through S
May 14	T through Z
June 11	A through D

Bring **finger-food** treats such as fruit, veggies, nuts, cookies, cold drinks and the like.

LACS provides hot drinks. See your email for updates and reminders. Please pick up your leftovers and serving pieces at the end of the meeting.

MEMBERS HELPING MEMBERS

LACS members volunteer to help other members solve hardware and software problems by telephone during the hours listed below. Select the topic from the list and then call a person whose number is listed next to it. Or you may use a Helper's e-mail address, found in your LACS Roster. We hope that you find this free service useful. **If you are experienced using a particular program or know a topic, please volunteer to be a consultant. You don't have to be an expert.** To volunteer for this list or to make corrections, please e-mail or call Leah Clark at Leahjc (at) sbcglobal.net or at 310-677-2792. More Quick Consultants, and more categories are always needed. You may decline or postpone a call if it comes at an inconvenient time.

Adobe Creative Suite: PDF,
   InDesign, PhotoShop, etc. - 17
Android Smartphones - 5
Apple devices - 15
Anti Malware and Backup - 5,12
Digital Imaging, Editing - 8
Digital Photography - 8
Dragon Naturally Speaking - 4
Genealogy - 5
Hardware - 12

Linux - 11
Lotus Word Pro, Approach - 12
Mozilla Firefox - 12
MS Excel - 3, 15
MS Word - 3, 4, 10
MS Outlook - 5, 15, 17
MS PowerPoint - 15
MS Publisher - 7
Open Office - 16

Photoshop - 17
QuickBooks -18
Quicken - 3, 5
Thunderbird - 12
Utilities - 5, 12
Visual Basic - 13
Websites - 13
Windows 7 - 16
Windows - 5, 12
WordPerfect - 5

No.	Name	Preferred Phone for Calls	From	To
3	Wilder, Joan	310-472-8445	9:00 AM	9:00 PM
4	Hershman, Irv	310-397-9453	11:00 AM	11:00 PM
5	Nordlinger, Stephanie	323-299-3244	10:00 AM	7:00 PM
7	Clark, Leah	310-677-2792	7:00 AM	5:00 PM
8	Silverstein, Elliot	310-670-1544	10:00 AM	10:00 PM
10	Beckman, Loling	310-471-7893	10:00 AM	6:00 PM
11	Hughes, Bill	424-259-1818	Any	Any
12	McKnight, Jim	310-823-7829	8:00 AM	7:00 PM
13	Ialongo, Gilbert	310-641-7906	9:00 AM	5:00 PM
15	Van Berkom, Paula	310-398-6734	9:00 AM	5:00 PM
16	Johnson, Carol	310-372-8535	10:00 AM	9:00 PM
17	Rozek, E. J.	310-823-3811	Noon	8:00 PM
18	Semple, Charlotte	310-398-5052 M-F	9:00 AM	5:00 PM

OFFICERS, DIRECTORS AND LEADERS

Title	Name	Term	Telephone
President	Leah Clark	2019	310-677-2792
Past President	Stanley Johnson	2019	424-216-6984
Vice President	Stephanie Nordlinger	2019	323-299-3244
Secretary	Stanley Johnson	2019	424-216-6984
Treasurer	Charlotte Semple	2019	310-398-5052
Director	Paula Van Berkom	2019	310-398-6734
Director	George Wolkon	2019	310-459-2671
Director	**Open**	2019	
Director	Carol Johnson	2020	310-372-8535
Director	E. J. Rozek	2020	310-823-3811
Director	Howard Krivoy	2020	310-717-7465
Director	Mark Presky	2020	310-398-0366
APCUG Rep.	Leah Clark		310-677-2792
Car Pool Coordinator	Freda Sanders		323-230-3278
Change of Address	George Wolkon		310-459-2671
Corporate Counsel	Stephanie Nordlinger		323-299-3244
CCSC Computer Lab	Loling Beckman		310-471-7893
Greeter	Freda Sanders		323-230-3278
Assistant Greeter	**Open**		
Hospitality Chair	Sylvia Davis		213-924-4927
Asst. Hospitality Chair	**Open**		323-230-3278
Membership Database	George Wolkon		310-459-2671
Newsletter Editor	Leah Clark		310-677-2792
Program Chair	Stephanie Nordlinger		323-299-3244
Assistant Program Chair	**Open**		
Publicity - Press	Mark Presky		310-398-0366
Publicity - Online Media	Stanley Johnson		424-216-6984
Quick Consultants	Leah Clark		310-677-2792
Webmaster	Paula Van Berkom		310-398-6734

Website	www.lacspc.org	**Newsletter Editor**	editor (at) lacspc.org
Voice Mail	1-310-398-0366	**Webmaster**	sitemaster (at) lacspc.org
E-mail	ContactUs (at) lacspc.org	**Change of Address**	membership (at) lacspc.org

The **ContactUs (at) lacspc.org** address goes to our **president** and **vice president**. If the message is for another officer or member, they will forward it to the correct person. To contact other officers, directors, leaders or members directly, members may use our roster for phone numbers and e-mail addresses.

DIGITAL CAMERA PROCESSING

By **Dick Maybach**
Brookdale Computer Users Group, NJ
BCUG Bytes, June issue
www.bcug.com
n2nd (at) att.net

In the March and April 2018 articles (available at http://www.bcug.com/index.html), we looked at digital camera anatomy and the processes it uses to capture an image. The camera then applies significant processing to correct defects in the image and enhance it.

Distortion

Barrel distortion, shown in **Figure 1**, is a lens effect which causes images to be "inflated". It typically occurs at the wide-angle setting of a zoom lens and is most visible in images with perfectly straight lines, especially when they are close to the edge of the image frame.

Figure 1: Barrel Distortion

Barrel distortion inflates the square
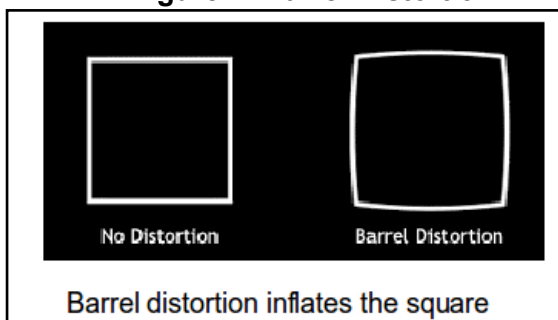
**Example of
Barrel Distortion**

Pincushion distortion, shown in **Figure 2**, is the opposite of barrel distortion and causes images to be pinched at their center. It too is most commonly associated with telephoto zoom lenses, typically at their high-magnification end. Like barrel distortion, it is most visible in images with perfectly straight lines, especially when they are close to the edge of the image frame.

Figure 2. Pincushion Distortion

Pincushion distortion deflates the square
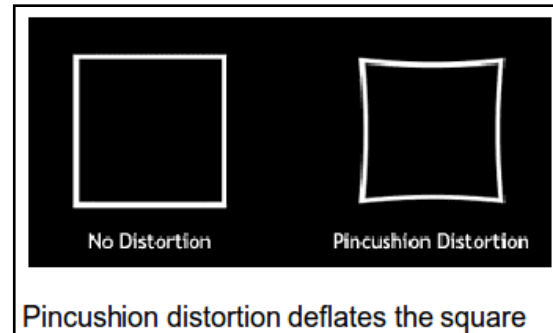
**Example of
Pincushion Distortion**

In the film-camera era, distortion was corrected with additional lens elements, making the lenses large, heavy, and expensive. Fortunately, if you know the lens settings, you know what distortion will occur, and this is how digital cameras correct it. They capture the image with distortion but move the pixels around to correct it before they record. Distortions of these types are functions of the lens, and interchangeable lenses have their own processors, which transmit the distortion characteristics of each image to the camera's main processor.

Another lens problem is **chromatic aberration** or "color fringing" caused by the camera lens not focusing different wavelengths of light onto the exact same focal plane (the focal length varies with wavelength) and/or by the lens magnifying different wavelengths differently; see **Figure 3**, page 13. Chromatic aberration is visible as color fringing around high-contrast edges and occurs more frequently around the edges of the image frame in wide angle shots. The amount of this can be predicted from the lens settings, so correcting it is possible, although not always done.
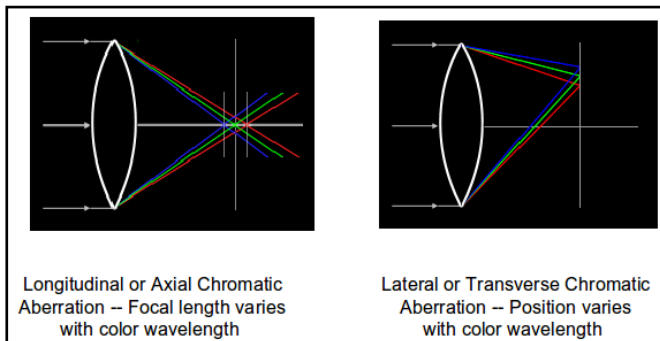
Figure 3. Chromatic Aberration

Bayer Color Filter Array

Each pixel on a digital camera sensor contains a light-sensitive photo-diode, which measures the brightness of light. Photo-diodes are monochrome devices, unable to sense color. Therefore, a mosaic pattern of color filters is positioned on top of the sensor to allow only red, green, or blue light to illuminate each pixel. The most common filter used in digital cameras is the GRGB Bayer Pattern, named after a Kodak engineer. The result is called a color filter array, shown in **Figure 4**. By breaking up the sensor into red, blue and green pixels, it is possibleto get enough information in the vicinity of each pixel to make an accurate estimate of the true color there.

Figure 4. Bayer Filter
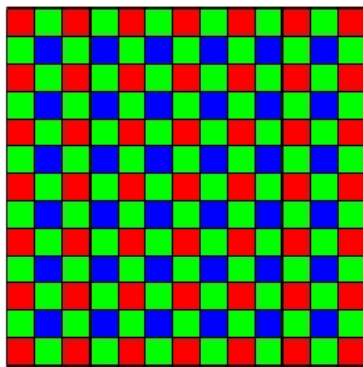
In the Bayer filter pattern, the colors are not evenly divided; there are as many green pixels as there are blue and red combined because our eyes are more sensitive to green detail than the detail of the other colors. The advantages of this method are that only one sensor is required, and all the color information (red, green and blue) is recorded at the same moment. The raw output from a sensor with a Bayer filter is a mosaic of red, green and blue pixels of different intensities. After a raw image has been obtained from a photo-sensor with a Bayer pattern of color filters, it must be converted into standard format (usually sRGB or Adobe RGB), where each pixel is a mixture of red, green, and blue. This process is called demosaicing.

Demosaicing

Bayer demosaicing is the process of translating a Bayer array of primary colors into a final image which contains full color information at each pixel. One way of making this conversion would be to group four Bayer pixels onto a single full-color one. This would, of course, reduce, the horizontal and vertical resolutions, each by a factor of two. Effectively what we have done is to define a set of 2x2 boxes, use the data from all four pixels to calculate a single full-color pixel, and place it in the center of the box. These are shown as black dots in **Figure 5**.

Figure 5. A Simple Demosaicing Process
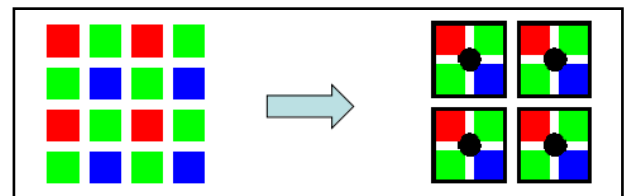
We improve the resolution by shifting our boxes one pixel to the right and computing a new set of full-color pixels also shifted one pixel to the right. Next, we could shift our boxes one row down and repeat. The result would be a set of the same number of full-color pixels as the total of all those in the Bayer array.

Practical demosaicing is more complex and uses more than four Bayer pixels to calculate each full-color one. This doesn't work well near the edges, since there are no longer pixels on all sides, but this is easily solved by discarding all the edge pixels. Because each full-color pixel is calculated from a group, there is some blurring of the image, which must be corrected by sharpening later.

White Balance

Pure white light is an equal mix of waves from all parts of this visible spectrum. In reality, light is seldom such an even mix. The color that illuminates the objects we photograph varies with the time of the day and with the light source, e.g., candlelight, electric bulbs, and fluorescent lighting. Sometimes there are a greater number of the longer waves in the light, causing images to appear reddish. At other times there are more short waves, producing bluish light. This means that the colors, we see as reflections, also contain varying qualities of color. In **Figure 6** the wall behind the lamp is white. In the image on the left, the camera has estimated the color of the white (called the white balance). The result is wrong because the scene was lit by an incandescent lamp, which has a powerful orange color cast. In the photograph to the right, the white balance program was set to Tungsten, which fits the light given by electric bulbs and is more correct than the camera's automatic estimate.

Figure 6. White Balance

The tinge a "white" light has is described as its **color temperature** and is measured in degrees Kelvin (K).

Figure 7 shows some color temperatures for common light sources: It might seem counter-intuitive that bluish light has a higher temperature than reddish light (since culturally we associate red with heat and blue with cold), but bluer light does contain more energy.

The Kelvin scale was determined by progressively heating a black object so that it glowed red, then white, then blue. The temperature of a light source will affect the appearance of a scene or of colored objects. Our eyes and brain tend to compensate for this, but when, for example, a more objective device like a camera captures a candle-lit scene, the resulting photographs will often appear much too orange.

Figure 7. Typical Color Temperature

Light Sources and Their Approximate Kelvin Values		
Candle	2000K	
Sunrise or Sunset	2500K	
Standard household light bulbs	3000K	
Noon on a sunny day "Daylight"	5500K	
Electronic flash	6000K	
Overcast sky	7500K	
Blue sky	12000K	

Compression

The most commonly used digital image format is JPEG (Joint Photographic Experts Group). Universally compatible with browsers, viewers, and image editing software, it allows photographic images to be compressed by a factor 10 to 20 (compared to the uncompressed original) with very little visible loss in image quality. **Figure 8** shows the effect of varying JPEG quality.

**Figure 8. Effect of JPEG Compression**.
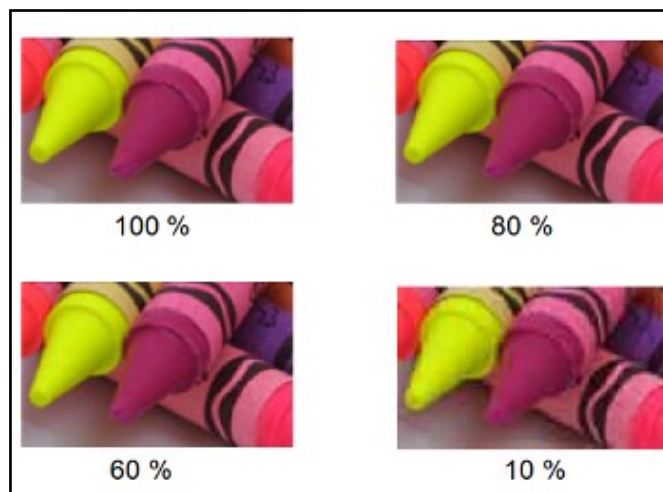
100% quality JPEG images are very hard to distinguish from the uncompressed originals, which

would typically take up 6 times more storage space. 80% quality JPEG still looks very good, especially when bearing in mind that this image is 2 times enlarged and that the file size is typically 10 times smaller than the uncompressed original. Notice some deterioration along the edges of the yellow crayon. Most digital cameras will use a higher quality level than 80% as their highest quality JPEG setting. If you look carefully at the 60% image, you will notice some JPEG squares and "hair" artifacts around the edges. It is a good tradeoff because the file size is typically 20 times smaller than the uncompressed original. The 10% image shows serious image degradation. The only benefit of this low-quality level is that it illustrates what JPEG is doing in a more subtle way at higher quality levels. It is unlikely you will ever compress this aggressively.

Correction and Enhancement

Figure 9 shows an image captured by the sensor before any processing has been applied. Because half the pixels in a Bayer array are equipped with green filters, the image is quite green. It's also dark because digital cameras deliberately underexpose to avoid saturating the pixels that record highlights. The next few screens will show the effects of processing.

Figure 9. Raw Image as Captured by a Sensor
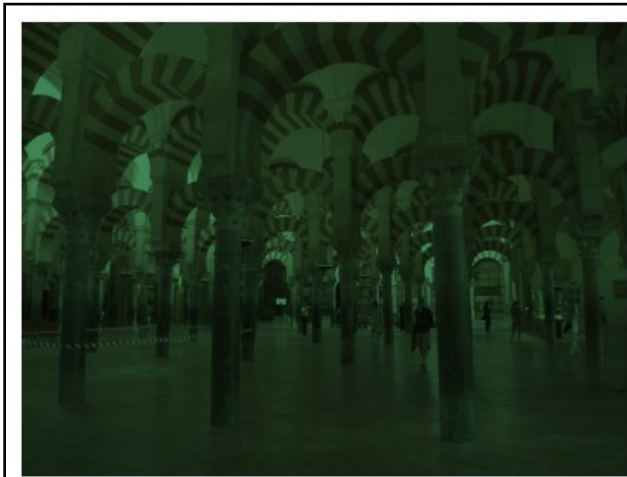
Demosaicing converts the clusters of green, red, and blue pixels, as shown on the left of **Figure 10**. (The right shows the raw image before this

processing.) The result is a set with each pixel having a combination of all three colors. The picture is still quite dark, as we haven't yet compensated for the underexposure.

Figure 10. Image Before (Right) and After (Left) Demosaicing

On the left of **Figure 11** the exposure has been corrected. However, there is now too much red, because this picture was taken indoors, where the light is far less blue than outdoors.

Figure 11. Image Before (Right) and After (Left) Exposure Correction

Your camera analyzes each picture and guesses what ambient light was present, or you can tell it. In **Figure 12**, I've used the camera's estimate, and the colors are truer.

**Figure 12. Image Before (Right) and After (Left) White Balance Correction**

Lenses, especially zooms, have distortion. In this case, there was some barrel distortion, which has been corrected in the top half of **Figure 13**. Note the pinching of the frame edges and the disconnects within the pillars This can be corrected optically by adding more lens elements, but this is costly. It's more cost effective to correct the distortion with software. This requires a database of the corrections needed for each focal length. Cameras that use interchangeable lenses store this data in the lens processor. Other corrections are possible, for example, for noise, chromatic aberration, and blur, but these are difficult to see, and I'll skip over them.

Figure 13. Image Before (Bottom) and After (Top) Distortion Correction

The result is somewhat dull. Most cameras will correct this by increasing the contrast and color saturation, as shown on the left in **Figure 14**. There is a trade-off between realism and drama, and many cameras have a setting to adjust this effect. When you think of all your camera must do to capture and store a realistic image, it's no wonder that it has far more processing power than desktop computers of just a few years ago. This is true of even the simplest point-and-shoot.

Figure 14. Contrast and Saturation Correction (Left)
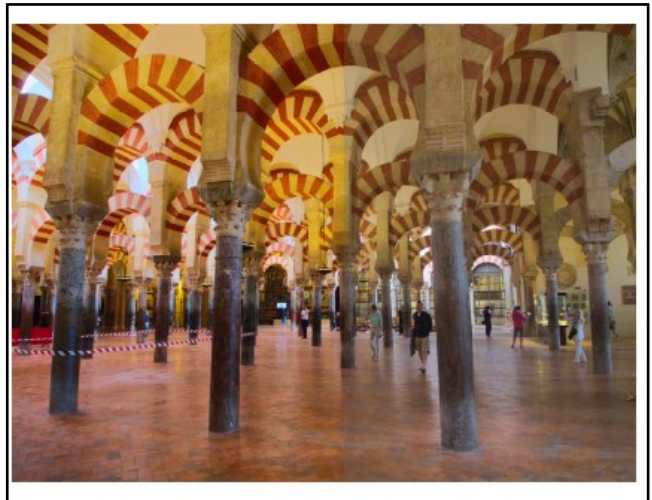
The processing to develop a single image is complex and occurs repeatedly when recording videos and viewing scenes before you press the button, the computing power residing in a digital camera, even a relatively simple one in a cell phone, is quite remarkable. Hopefully, this series has given you some appreciation of it. ❖

JANUARY

By **Leah Clark**, President and Editor
Los Angeles Computer Society
Lacspc.org
January is named after the Roman god, Janus, the god of doors because this month is the door to the year. Janus represents all beginnings and possesses the ability to see all things past and future. January was added to the Roman Calendar around 700 BCE so that the calendar would equal a standard lunar year of 355 days. ❖

Financial Software *(Continued from page 7)*

Date	Num	Description		Tot Deposit	Tot Withdra	Balance
12/31/2017		Opening Balance	Equity:Retained Earnings y	3,141.59		3,141.59
01/02/2018	DEP	World Wide Widgets	Income n	1,814.22		4,955.81
01/02/2018	3743	Jensen Realty	Housing n		214.87	4,740.94
01/07/2018	3744	Wayside Chapel	Charity n		25.00	4,715.94
01/09/2018	3745	Juicy Central	Housing n		76.87	4,639.07
01/12/2018	3746	Cash	Misc. n		100.00	4,539.07
01/14/2018	3747	Wayside Chapel	Charity n		25.00	4,514.07
01/15/2018	3748	United States Treasury	Tax n		127.00	4,387.07
01/15/2018	3749	Ace Credit	Travel n		139.45	4,247.62
01/18/2018	3750	Dr. Walenski	Medical n		50.00	4,197.62
01/21/2018	3751	Wayside Chapel	Charity n		25.00	4,172.62
01/22/2018	3752	Double Cross	Medical n		87.00	4,085.62
01/24/2018	3753	Semi Public Service	Housing n		105.57	3,980.05
01/26/2018	3754	Cash	Misc. n		100.00	3,880.05
01/28/2018	3755	Wayside Chapel	Charity n		25.00	3,855.05
01/29/2018	3756	Comicast	Housing n		114.95	3,740.10
01/30/2018	3757	Shady Lawn	Invest n		75.00	3,665.10
01/30/2018	3758	Capital Two		*Tot Deposit*	447.64	3,217.46
			Misc. n	56.22		
			Clothing n	76.55		
			Travel n	68.98		
			Dining n	63.22		
			Groceries n	182.67		
			Checking n		447.64	
01/31/2018	EFT	Wealth Forgo	Income n	0.02		3,217.48
02/01/2018	DEP	World Wide Widgets	Income n	1,814.22		5,031.70
02/01/2018	3759	Jensen Realty	Housing n		214.87	4,816.83
02/04/2018	3760	Wayside Chapel	Charity n		25.00	4,791.83
02/05/2018			n			

Present: $4,791.83   Future: $4,791.83   Cleared: $3,141.59   Reconciled: $3,141.59   Projected Minimum: $4,791.83

Capital Two

Screen 6. GnuCash Checking Account Transactions

that are at least aesthetically unpleasing. For example, although the process went smoothly for GnuCash, after importing over ten years of Quicken data into HomeBank, I found that the Income category had been classified as an expense. You may prefer just to pick a date (probably January 1) and to begin entering data into the new program. Prepare for this by entering data in both during November and December, so that you would be comfortable using the new program by the change-over date.

One minor caution, TurboTax can import transaction data only in TFX files, and although Quicken and GnuCash can export these, HomeBank cannot. However, using this feature greatly increases the amount of data you must enter for each income item,

Screen 7. GnuCash Reconcile Window

Financial Software *(Continued from page 17)*

and it requires that Quicken or GnuCash be configured carefully. For most of us, entering the data from our W2 and 1099 forms is far easier.

To answer my initial questions, yes, there are viable free alternatives to Quicken that you can use for your home, organization, and small business. They aren't clones, and adapting to them will require time and effort. Be prepared to spend several months using your present accounting program and its replacement candidate(s) in parallel before making the switch. You may decide that Quicken is worth its subscription price. ❖

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LAUGHING OUT LOUD

Tech support: "What does the screen say now?"

Customer: "It says 'Hit enter when ready.'"

Tech support: "Well?"

Customer: "How do I know when it's ready?"

My techie husband and I were walking in the high desert when he stopped to photograph one stunning vista after another.

Overcome by the sheer beauty, he paid it his ultimate compliment: "Wow... everywhere I look, I see a screen saver!"

The latest computer related best-sellers...

  - A Tale of Two CD's
  - Gates of Wrath
  - Gone with the Windows
  - War and PC
  - Moby Disk

All URL links in *User Friendly are* clickable on the online version at www.lacspc.org/category/user-friendly/.

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Annual membership Dues:

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    Printed Newsletter $ 40
    Electronic Newsletter   30
Family-Associate   12
Students   18
Contributor   50
Supporter   75
Benefactor   100

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Associate members are those who live in the same household or work at the same address as a regular member; they do not receive their own subscriptions to *User Friendly*, but may read it on the LACS website. **Students** must prove full-time status.

In addition to monthly general meetings, members enjoy these special benefits:

  -- Monthly Newsletter *User Friendly*. We publish your article submissions or free classified ads to buy or sell your computer items.

  -- Get FREE help by phone from knowledgeable members who are Quick Consultants listed in *User Friendly.*

  -- Get help by email by using our LACSLIST Yahoo Group Mail List. Send your questions by e-mail to lacslist (at) yahoogroups.com

  -- Receive important news and announcements via *User Friendly* and LACS's Yahoo Group e-mail lists.

  -- Occasional product **discounts**, special offers, etc.

  -- Special Interest Groups (SIGs) on various topics may be created to help you to learn, to share interests, and to solve your computer problems.

  -- Information on training, swap meets and trade shows.

  -- Occasional **Free software and computer books**, if you review them for *User Friendly*.

  -- Rewards for recruiting; LACS will extend your membership for three months for each new regular member you recruit.

  -- Annual Holiday Party

  -- Field trips

  -- Social Interacting with others who have like interests in computers and technology.

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[ ] New   [ ] Renewal   **Please PRINT Clearly**

[ ] With printed newsletter [ ] $40.00   [ ] Associate $12.00   [ ] Student - $18.00

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Name: First   Last

Name of Associate: First   Last

Address:

City, State, Zip + 4

Email: Email of Associate:

Preferred Phone: Publish Contact Info in Roster [ ] Yes   [ ] No

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Church Fellowship Hall
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Los Angeles CA 90045

From the North:

Take Sepulveda Blvd. SOUTH
to W. 80th St. Turn WEST/right.
Go about one mile to Emerson
Ave. Turn SOUTH/left. Go one
long block to W. 80th Place. It
is on the Northwest corner of
Emerson and W. 80th Place.

From the South, East or West:
Take Manchester Ave. to
Emerson Ave. Turn NORTH. Go
about eight blocks to W. 80th
Place. Fellowship Hall is on the
Northwest corner of Emerson
and W. 80th Place. There is
street parking and a small
parking lot West of the church.