

# The Databus

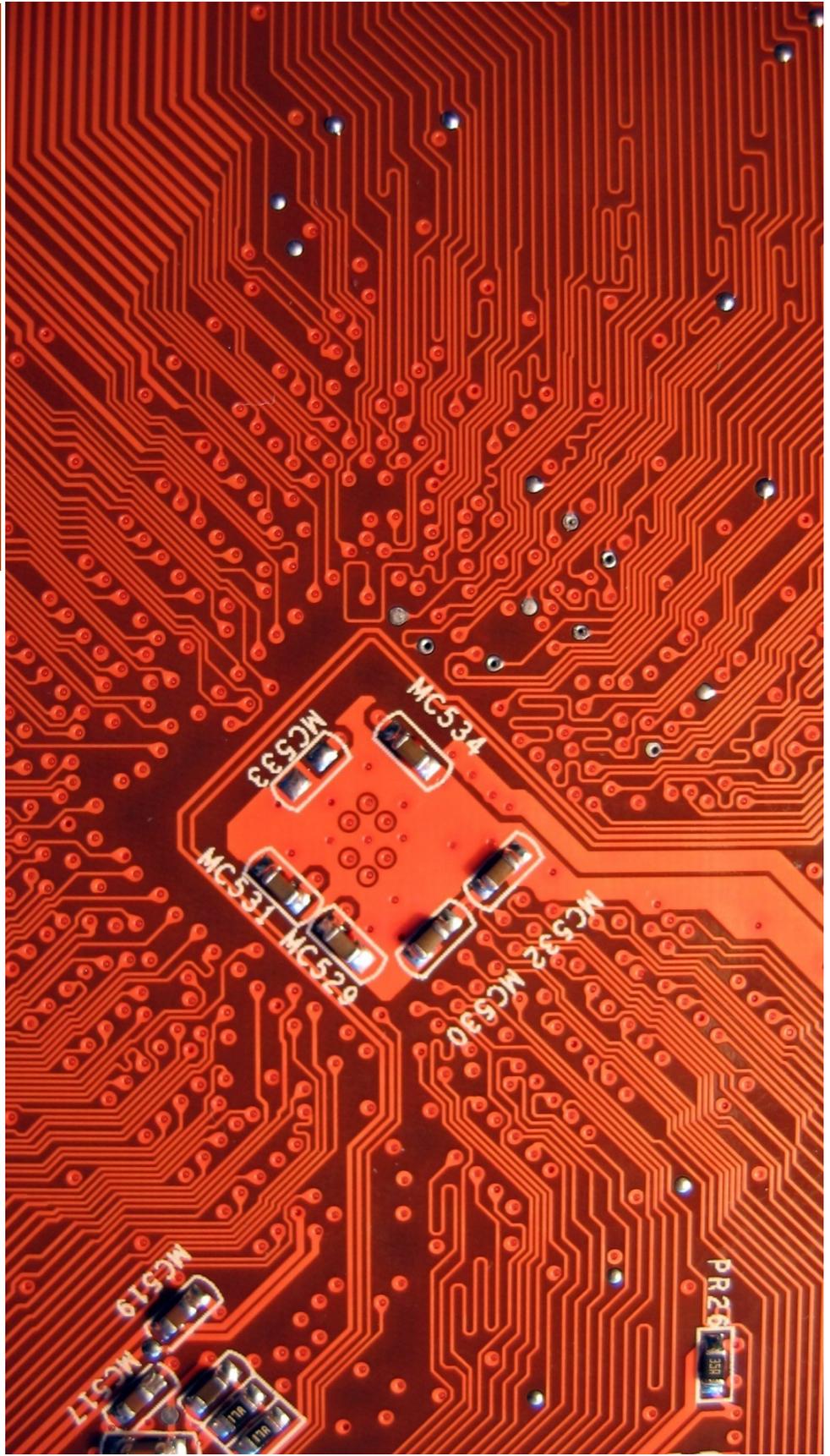
Newsletter of  
THE DAYTON MICROCOMPUTER ASSOCIATION

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NOTE: If you prefer to print THE DATABUS rather than read it directly from the screen of your monitor, save a tree (or at least a twig). Don't print page 14 unless you plan to become a DMA member or renew your membership.

**Volume VIII**  
**(New Series)**  
**Number 2**  
**February 2018**





Post Office Box  
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Visit us at:

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## Your 2017/18 Officers:

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Glady CAMPION

*Officers need not be Trustees.*

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Brent KERLIN

Debra MCFALL

Ken PHELPS

Gary TURNER

## Webmaster:

Brent KERLIN

### *Webmaster Emeritus:*

Dave LUNDY

ESTABLISHED IN 1976, DMA is a group of Dayton-area professionals and hobbyists in the field of computing and digital information technology. General membership meetings are usually on the last Tuesday of each month. DMA has a number of Special Interest Groups (SIGs) in areas ranging from digital investing and genealogy to the Linux operating system. Each SIG meets according to its own schedule. DMA is a member of the Association of Personal Computer Users' Groups (APCUG) and the Affiliated Societies Council (ASC). Click on any of the logos—including our own (top left)—to go to that organization's Web site.



### Submissions ...

THE DATABUS welcomes compliments, complaints, suggestions, and especially articles. We can accept articles in ASCII, or as attachments in Microsoft Word or Works, Open Office Writer, Word Perfect, or, yes, even WordStar (a word-processing program that goes all the way back to about 1980!). No PDF files, please. Send articles to:

[Editor@DMA1.org](mailto:Editor@DMA1.org)

All articles are subject to editing for spelling, grammar, usage, and space. Always retain a copy of your work, as THE DATABUS cannot be responsible for loss. When articles are of roughly equal quality, those by paid-up DMA members usually receive preference.

ALL REGISTERED TRADEMARKS, for example: DMA, Joomla, Raspberry Pi, Scratch, AT&T, or Windows are the property of their respective owners. However, the Registered Trade Mark symbols (® or ™) have been omitted for better readability. The Editor occasionally inserts comments into articles. Such comments are often in square brackets [like these] and are always preceded by the phrase: "EDITOR'S NOTE."

THE DATABUS is written and published by volunteers. We do not give professional advice on computer, network, or software purchase, installation, repair, or security. If you need expert assistance, please seek the services of a competent professional (preferably a DMA member).

*FEBRUARY MEETING: 7:00 P.M., Tuesday, the 27<sup>th</sup>, at T. J. Chump's, 7050 Executive Boulevard, Huber Heights 45424 (next door to Meijer's) —click [here](#) for a map. Come at 6:00 P.M. if you wish to join us for dinner. There's plenty of free parking. (Also accessible via RTA bus routes #18 & 19, but you must take a short walk over from the Meijer's store.)*

**No charge—bring a friend!**

## Gary TURNER & Ken PHELPS: *Linux for Beginners*

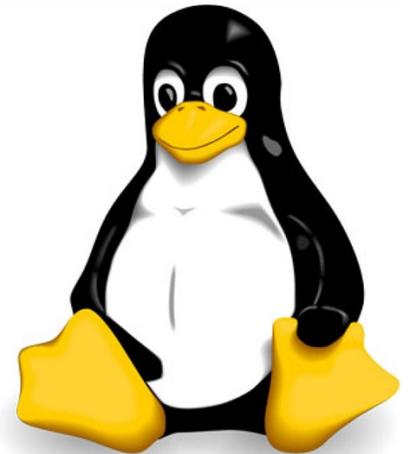
LINUX POWERS 94% of the world's supercomputers, most of the servers powering the Internet, the majority of financial trades worldwide and a billion Android devices. In short, Linux is everywhere. It appears in many different architectures, from mainframes to servers to desktops to mobile (tablets and smart [hones), from embedded systems to virtually all supercomputers, and on a staggeringly wide variety of hardware.

Way back in 1991, while attending the University of Helsinki, Linus Torvalds became frustrated with the accessibility of MINIX and began to work on his own operating system kernel, which eventually became the Linux kernel. He continues to direct the development of the kernel to this day. The primary difference between Linux and many other popular contemporary operating systems is that the Linux kernel and components are free and open-source software. Linux is not the only such operating system, although it is by far the most widely used.

The body of software called Linux continuously evolves. There are distros (distributions) for nearly every hardware configuration or project application. This presentation is for anyone who wants to see what is available for novice users, how easily Linux can be installed, and how easy today's versions are to use.

Gary TURNER is a charter member of DMA, Trustee, member of the Investment Special Interest Group (SIG), co-chairman of the Net Administration Team, and leader of the Linux SIG.

Ken PHELPS is also a long-time member of DMA, Trustee, and co-chairman of the Net Admin team.



**M**inutes are normally published almost two months late, because the Minutes for, say, the January Board meeting must be approved by the Trustees at the following month's meeting—in this case, early February. The corrected and approved January Minutes would thus usually appear in the February DATABUS (this issue), published toward the end of the month.

Time and place of the next Trustees' meeting will be announced at the General Membership Meeting on Tuesday (the 27<sup>th</sup>). Trustees' meetings begin at 7:00 P.M. and are open to all DMA members. The Trustees usually meet for dinner beforehand, and the restaurant will also be announced at Tuesday's meeting. Those wishing to dine with the Trustees should come at 6:00.

## MINUTES—DMA BOARD OF TRUSTEES

### DMA Board of Trustees — Meeting of Monday, January 8, 2018

#### CALL TO ORDER

The meeting was called to order at 7:47 P.M. by Gary Coy.

Trustees present: Gladys Campion, Gary Coy, Brent Kerlin, Ed Skuya, Gary Turner  
Absent: Pat Flynn, Peter Hess, Debra McFall, Ken Phelps

#### OFFICERS' REPORTS

**President**—Gary Coy

The Holiday dinner went well. From the comments, people liked the variety of door prizes.

**Vice President**—Peter Hess

No report

**Secretary**—Gladys Campion

Gladys presented the minutes for the previous board meeting. Gary Turner moved the minutes be accepted as corrected. Ed Skuya seconded and the motion passed with Brent and Gladys abstaining.

**Treasurer**—Pat Flynn

No report

#### COMMITTEE REPORTS

**Audit** – Gladys Campion

In progress

**Bylaws Review** – Eric Ottoson

Gladys will send the board a draft of the bylaws with proposed updates. Eric will hold a review at the board meeting in February.

**Fund Raising** – Peter Hess

No report

**Membership** – Gladys Campion

December was when we held the Holiday Dinner. No membership stats were taken.

Account Balances:

No Treasurer's Report this month.

(Continued on page 6)

**—Is Your Cell Phone CDMA or GSM? And Should You Care?—**

By Phil SORRENTINO, Contributing Writer, The Computer Club, Florida

*The Journal of The Computer Club, Inc.*

<http://sccccomputerclub.org> / [Philsorr.wordpress.com](http://Philsorr.wordpress.com)

philsorr (at) yahoo.com

THE SHORT ANSWER to the second question is “probably no,” but there are some benefits from knowing the differences that may help you decide which cell phone provider or cell phone to choose. The answer to the first question depends on your cell phone provider. CDMA and GSM are the two basic technologies used in modern digital cellular networks, which are then used by mobile phones. These two technologies are very different. The difference is much more than that between a Ford and a Chevy. It’s more like the differences between a gas-powered car and an electric vehicle; they both do the same thing, they get you to your destination, but the internal workings are poles apart. You can’t use a CDMA phone on a GSM network (and *vice versa*), just as you couldn’t use the gas engine from the gas-powered vehicle to run an electric vehicle. Thus, if you are on a CDMA network, you need a phone with CDMA radio-telephone circuitry, and if you are on a GSM network, you must have GSM circuitry in your phone. So, which type of circuitry a phone has may be a question you will have to answer when signing up for your next cell phone plan.

Although there are many places to *buy* a cell phone, in the United States there are only four major cell phone *networks*. (US Cellular is actually a fifth, but much smaller network.) The four are Verizon, AT&T, Sprint, and T-Mobile, and they are evenly divided by the technologies used. Verizon and Sprint use CDMA and AT&T and T-Mobile use GSM. (US Cellular uses CDMA.) CDMA stands for Code Division Multiple Access and GSM is short for Global System for Mobile [Communications], both of which are terms used to represent the collection of many radio-telephone technologies that comprise the two different systems. CDMA actually describes the technology that is used to keep separate all the data channels that use the same wireless frequency band, whereas GSM is the name of a standard used to describe the protocols used in digital cellular networks. But then what’s in a name? A rose by any other name would still be a rose. Most of the world outside the US uses GSM, so if you need to use your phone overseas, it will probably have to be compatible with GSM. This is another example of how an open standard can dominate a proprietary product (think Android over iOS). GSM is an open standard, developed by the European Telecommunications Standards Institute, whereas CDMA is a proprietary technology developed and owned by Qualcomm. (Just to be complete, GSM uses a Time Division technique for keeping channels separate.)

Another difference of which you may already be aware is the SIM card, or Subscriber Identity Module. GSM uses a removable SIM card as a container for customer information.

*(Continued on page 8)*

(MINUTES—Continued from page 4)

**Net Administration Team** – Ken Phelps, Gary Turner, Pat Flynn, Brent Kerlin

Web site and Meetup are running fine. There were 44 new visitors to the DMA website last month. There was a suggestion of adding metrics to the DMA Slack as a Marketing channel.

**Programs** – *Open!!!*

- ✓ January will be “Toys I got for Christmas” by Gary Coy
- ✓ February - Linux for the basic user by Gary Turner and Ken Phelps
- ✓ March suggestion – A DMA version of RightThisMinute.com

Other suggestions – Smart Home, Mobile computing, Cell phone tricks (like casting).

*We need to find a Programs chairman!*

**Publications** – Martin Arbagi

The December DATABUS was posted to the website.

**Publicity** — Ed Skuya, Gary Coy, Pat Flynn, Peter Hess

Pat Craig is still trying to get the *City Paper* to update the DMA notice with the phrase “except December.” He volunteered to post flyers at Wright State and Clark State.

**OLD BUSINESS**

**Records Committee** – Gladys Campion, Martin Arbagi

Still in progress

**Wright State Archives** – Martin Arbagi, Gladys Campion

Still in progress

**Next Board Meeting**

The next Board Meeting will be 7:00 P.M. on Monday, January 8, 2017 at the Fairborn Fire Station #2, 2200 Commerce Center, Fairborn. Those who want to join us for dinner should meet at 6:00 P.M. at Kroger’s Food Court, 1161 East Dayton Yellow Springs Rd, Fairborn.

The Community Room at Fairborn Fire Station #2 has been reserved through June 2018.

**Dayton Diode Lease With K12 & Tejas Gallery**

Brent will take the latest version of the lease to the lawyer and send a copy to the board.

**Holiday Dinner** – Gladys Campion

Gladys needs to present a final report to the board.

**Pushing content to TV screens at DMA meetings**

Gladys is collecting adapters and will bring them to monthly meetings. Gary Coy offered a chrome cast.

**Think TV Auction in April** – Gary Turner

Brent Kerlin moved we allow Gary Turner up to \$200 to purchase two Pi kits for donation to the Think TV Auction in April. Gary Turner offered to purchase the kits and donate them to Think TV

**NEW BUSINESS**

**Techfest** – Gladys Campion

Techfest will be held 10:00 A.M. to 6:00 P.M. Saturday, Feb 17 and 11:00 A.M.-5:00 P.M. Sunday, Feb 18 at the Sinclair College Ponitz Center (Bldg 12). DMA will be sending three teams: Gary

*(Continued on page 7)*

(MINUTES—Continued from page 6)

Ganger's Computer Museum, the Linux SIG, and the DMA display will be shared by Dayton Diode and Programming for STEM.

**Computing for STEM** – Patrick Craig

Our newest SIG, Computing for STEM, will hold its first meeting at 7:00 P.M. Friday, Jan 19, in the Community Room at The Greene. This will be a brain-storming session. Topics will include “Should we hand everything over to the computer?”

**ADJOURNMENT**

Gary Turner moved to adjourn at 9:05 P.M. Brent Kerlin seconded and the motion passed.

*Respectfully Submitted,  
Glady Champion,  
Secretary*

## Help DMA by using Amazon's “Smile” program!

**A**MAZON, the Internet's largest retailer (if you haven't noticed, Amazon isn't just for books any more!) has a “Smile” feature whereby Amazon donates a percentage of almost any purchase you make to a selected nonprofit organization. There is *no* extra cost to you. Click [here](#) to learn more or here to go directly to the sign-up page. Be sure to put DMA down as the beneficiary of your purchases.

*(CDMA OE GSM?—Continued from page 5)*

CDMA does not typically use a SIM card. The SIM card is an integrated circuit chip that is intended securely to store the International Mobile Subscriber Identity (IMSI) number and its related cryptographic key, both of which are used to identify and authenticate subscriber devices. It's much easier to change phones on GSM networks, because of the removable SIM card. Just take the card out, put it into another phone, and the new phone now has your number. CDMA networks use a different technique to identify and authenticate subscriber devices. CDMA uses a network-based data base. The phone information must be put into a "white list" data base that is then used to control access to the network. If you have a CDMA phone with a SIM card, it may be there to support foreign GSM networks and the phone may be called a "world phone" (which may be good to have if you travel a lot). You may also find a SIM card in a newer CDMA phone. It may be there to support the newer faster 4G LTE networks, because SIM cards are part of this new standard.

Where did 4G LTE come from? you might ask. Well, so far, we haven't said anything about network speed and that is what 4G LTE refers to. Most current networks operate at a 3G speed, which translates to a data rate of around 1-2Mbps. 3G has been in use since about 2003. The G only indicates Generation. The 4<sup>th</sup> Generation or 4G provides an almost tenfold increase in speed, so 4G will move data at around 10Mbps. The LTE indicates "Long-Term Evolution", which is a standard for high-speed wireless communications for mobile phones and devices. LTE is the upgrade path for both GSM and CDMA networks. (By the way, 1G was for analog cell phones and 2G was for early digital cell phones.) So now many phones have the appropriate hardware and software that enable them to operate on both 3G and 4G networks of their specific type: GSM or CDMA. The cost of a phone that can operate on the 4G network will be higher than a phone that can operate only on the 3G network. (There are many technical details defining and describing the 3G and 4G and even the future 5G standards but I have simplified things so as to not get bogged down in those voluminous and sticky details.)

All of the four major networks have 4G, so if money is not an issue, a 4G phone would be advisable. Also, if you spend a lot of time on the web or regularly stream video, 4G might just be worth the extra phone cost. So, in general, if you expect to transfer large amounts of data, 4G is definitely worth it, but keep in mind that it is very easy to go over your data plan limit when you are working at the higher speed. Finally, if you want to future-proof your phone, get a 4G phone. 4G is only going to get better because that is where network operators are spending their money. Also realize that a 4G phone is backward compatible and will operate on 3G and even 2G networks. You still might consider only a 3G phone if you don't have a need for the faster data rate of 4G, or you use it mostly for voice. Also, if you live in an area that doesn't have 4G yet, the 3G phone might be just fine. In the long run, you should probably care about the network type so you can make an informed decision the next time you have to buy a phone or phone plan.

... TDB

## —Raspberry Pi: An Introduction—

By Dick MAYBACH, Member, Brookdale Computer Users' Group, NJ

September 2017 issue, *BUG Bytes*

[www.bcug.com](http://www.bcug.com)

n2nd (at) att.net

I INTRODUCED THE ARDUINO in my August 2017 article (available at <http://www.bcug.com>), and this month I'll do the same for the Raspberry Pi. Although the two are both small, inexpensive, single-board devices designed to aid people to learn computer technology, they provide much different experiences. Using the Arduino is like visiting one of our national parks; while you will learn new things, you stay in a familiar environment. In particular, you work on your home computer using your present operating system. Using the Pi is more like touring a foreign country on your own; you are in a new environment with much to learn to become comfortable. In particular, you are using Linux on a completely new PC, and rather than just using applications. Much of the time you will be configuring the system, often from the command line. While the rewards of mastering the Pi are greater, so is the effort required to achieve them.

The Raspberry Pi is a single-board computer requiring only a micro SD storage card, display, keyboard, and mouse for a complete desktop system. It normally runs under Linux, and the great majority of applications and activity are based on this operating system. (A smart-phone-like version of Windows has recently become available for it: <https://developer.microsoft.com/en-us/windows/iot>. Like Linux, it is free, but is far less capable than either Linux or Windows 10 and has far fewer applications and much less activity. However, the download is free, so experimenting with it costs nothing. In the remainder of this article, I'll discuss only the Pi running Linux.) When you enter the Raspberry Pi world, you go back in time to the PC scene of the early 1980s. Instead of buying a complete computer, you get parts or kits and build what you want. Those who enjoyed that earlier time will be impressed with how much cheaper, smaller, and more capable the results are. The Pi is a complete computer with network access and applications that include office suites, complex mathematical analysis, graphics, and software design programs, and you can do anything with it that you now do on your PC. However, it's much slower, so such tasks as complex photographic manipulation aren't practical.

The Pi project began February 2012 with a single model, but in the years since, has evolved into a family, both from the original organization and independents. The Raspberry Pi organization produces the following models:

- The **Pi Zero** is the smallest lightest and cheapest. It's not suitable for use as a PC, but as a component. It features small size and low power consumption, but lacks the interface ports of the other models.
- The **Pi 1 A+** is also intended for use as a component, although unlike the Zero it does have a full-sized USB and a HDMI port.
- The **Pi 1 B+** includes several ports, including four USBs, an HDMI [a video output similar to VGA, but more compact], an Ethernet, and a multi-pin general-purpose port. This can func-

*(Continued on page 10)*

(INTRODUCING RASBERRY PI—Continued from page 9)

tion as a PC, although those below are considerably faster. It's been used for media centers, robotics, information displays, and in the International Space Station.

- The **Pi 2** is similar to the 1 B+, but has a faster CPU. It's been used as a desktop PC, media center, web server, and gaming emulator.
- The **Pi 3** is currently the most capable of the family, with the fastest clock speed, the most RAM, the best all-round feature set, including Wi-Fi and Bluetooth. It does consume more power, but it does make a credible PC, although one that is slower than current standards.

When you begin using a Raspberry Pi, you will need to equip it with a mouse, keyboard, and display, and this is surely how you should begin. Alternatively, you could connect it to your network and operate from your PC, which means the Pi doesn't need a display, keyboard, or mouse. You control it either in command-line mode using the secure shell protocol (SSH) or using a remote desktop application to access the graphical interface. My experience is that getting these set up requires some experimentation, so you should wait until you become comfortable with the Pi before you try either. Figure 1 shows the start of an SSH command-line session. It will look familiar to Linux users. This is a window on my desktop PC; the Pi is across the room and connected by a local area network (LAN).

```
login as: pi
pi@pi-serve's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

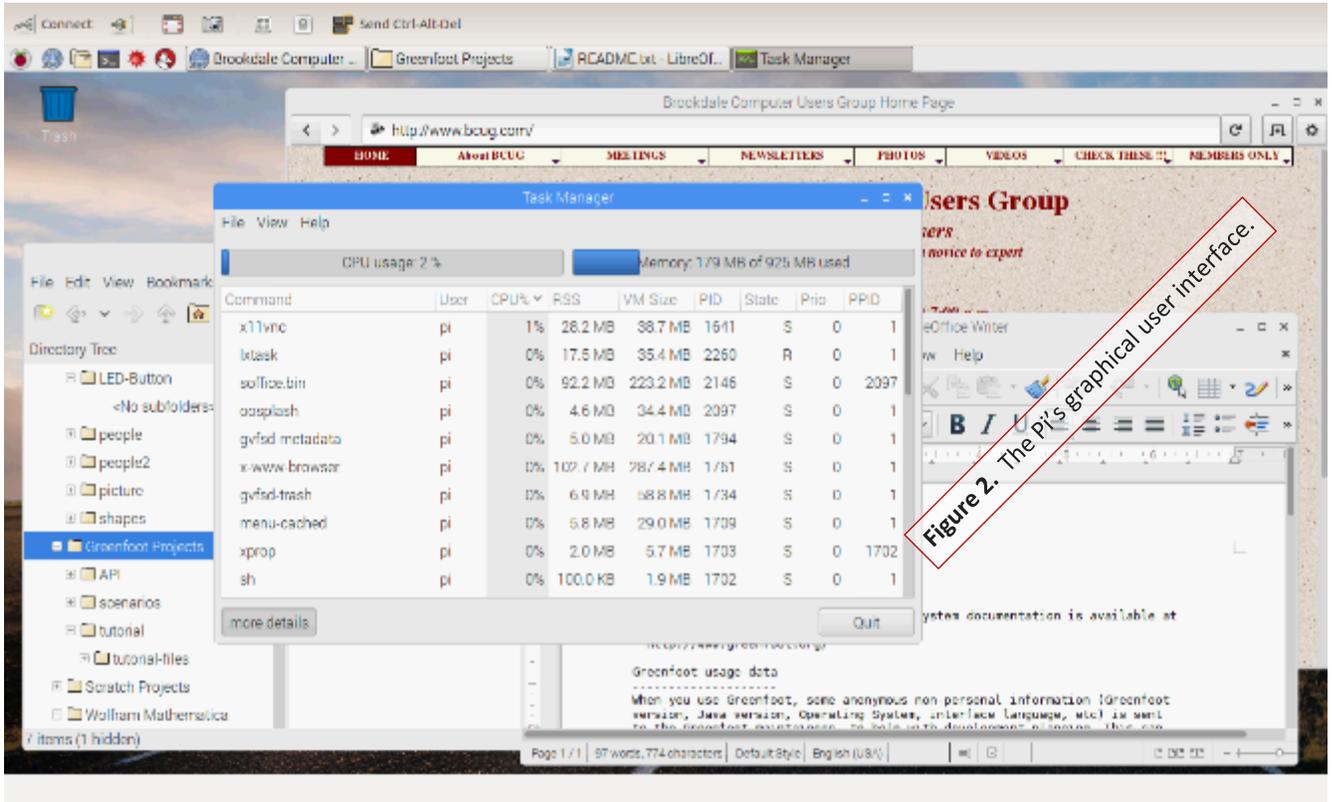
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Mon Oct  3 14:41:07 2016 from i7.attlocal.net
pi@pi-serve:~$ ls -l
total 40
drwxr-xr-x  2 pi pi 4096 May 27 07:40 Desktop
drwxr-xr-x  6 pi pi 4096 Oct  2 23:23 Documents
drwxr-xr-x  2 pi pi 4096 Jul  3 18:00 Downloads
drwxr-xr-x  2 pi pi 4096 Jun  1 21:46 Music
drwxr-xr-x  4 pi pi 4096 Oct  2 14:27 oldconffiles
drwxr-xr-x  2 pi pi 4096 Jun  1 21:46 Pictures
drwxr-xr-x  2 pi pi 4096 Jun  1 21:46 Public
drwxr-xr-x  2 pi pi 4096 May 27 07:40 python_games
drwxr-xr-x  2 pi pi 4096 Jun  1 21:46 Templates
drwxr-xr-x  2 pi pi 4096 Jun  1 21:46 Videos
pi@pi-serve:~$ ls /
bin boot dev etc home lib lost+found media mnt opt proc root run sbin srv sys tmp usr var
pi@pi-serve:~$
```

FIGURE 1: Controlling a Pi Over a Network Using SSH.

(Continued on page 11)

(INTRODUCING RASBERRY PI—Continued from page 10)

Figure 2 (next page) is a remote-desktop window on my desktop PC showing the Pi's graphical interface, with three open applications: Web browser, file manager, task manager, and word processor. Normally, you wouldn't put this much load on such a small machine, but I did it here to make the point that it is a complete (although slow) PC.



The Raspberrian operating system, a variant of Linux available from the Raspberry organization, <https://www.raspberrypi.org/>, includes the symbolic mathematics program Wolfram Mathematica, <https://www.wolfram.com/raspberry-pi/>, which is similar to but more sophisticated than wxMaxima, discussed in the July 2017 issue of *Bytes* (available at <http://www.bcug.com>). Screen 3 shows three examples of its use, calculating a sum of integers, expanding an expression, and solving a set of three algebraic equations. There is much more to this tool, including plotting and Calculus. (See Figure 3 on page 13.)

Once you have a working PI, what might you do with it? Because it's separate from the PC

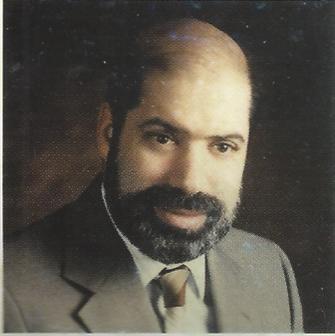
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## Have a business card? Are you a DMA member?

ANY PAID-UP MEMBER of the Dayton Microcomputer Association is entitled to a *free* business card-sized advertisement in THE DATABUS. Send a good-quality image to [Editor@DMA1.org](mailto:Editor@DMA1.org), or give your business card to **Martin Arbaji**, the Editor, at any DMA meeting. We can embed a link to your Web site (if you have one) in the image of your card. Under weird IRS regulations, your Web site may not include discount coupons for DMA members, although discount *offers* (not coupons) may be included in the advertisement *itself*. See the example below right, which includes a member discount. But the advertiser could not put the discount on his Web site.



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(INTRODUCING RASBERRY PI—Continued from page 11)

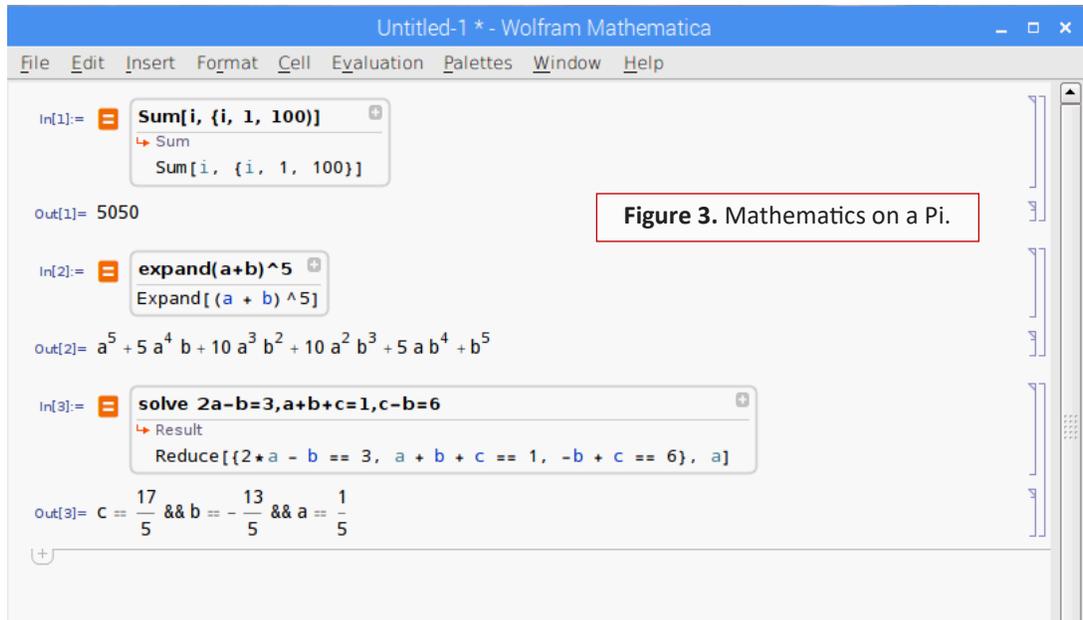
with your tax returns, family photos, and other valuable data, you can use it as a sandbox where you can experiment without risk.

- **Surf the Internet safely**—If a rogue site does manage to install malware on the Pi, it is still isolated from your main PC. This makes it useful for guest use, especially for those fearless young people. You might even consider setting up a separate e-mail account, just for use while using the Pi, for use when a site demands an e-mail address before letting you go any further.

- **Learn to Program**—The Pi runs on Linux, and one of that operating system's strong points is the wide variety of languages it supports, many with complete development environments. If you make a horrible mistake, the damage is isolated. Consider Scratch if you just want a taste of what programming is or if you want to introduce a young person to it, or Python for a versatile, modern language, less complex than traditional ones, such C. Python is well supported with many books and on-line communities.

- **Build a Server**—The Pi's low cost, small size, and low power consumption make it well suited for server duty on your home network. A print server would allow you to share one printer with all your PCs. A file server would allow you to synchronize the contents of selected

(Continued on page 13)



(INTRODUCING RASPBERRY PI—Continued from page 12)

directories on PCs or would provide a single point for backups. A website server would provide an internal site for sharing information or would give you a place to learn website design. You could keep this simple (HTML only) or could add PHP support or even complete WordPress or Joomla services. Once the site is set up, you can remove its keyboard, mouse, and display. With any of these servers, you are also learning networking.

- **Connect Hardware**—The Pi has a multi-pin interface to connect external hardware and many expansion boards to make this easier. (While Arduino expansion boards are called shields, those for the Pi are hats.) An Internet search will provide ideas for home control, Internet data collection, weather monitoring, and robotics. You probably don't want to use your home PC for such things, but again, the Pi's small cost, size, and power requirements open up these areas. And if a disaster does strike, you can replace your Pi for about \$35.

You can make a Web search for more information, but do check the following:

The official Raspberry Pi site is <http://www.raspberrypi.org/>. This is where you get software for it, read news about its development, see what members of its community are doing, and ask for help.

A free monthly magazine, the *MagPI* is available at <http://www.raspberrypi.org/magpi/>. There are over fifty issues available for download, each with news and projects. A printed version is also available—but it's not free.

There are many dealers for the Raspberry Pi, expansion cards, kits, accessories, books, and suggested experiments. Two popular ones are Adafruit, <http://www.adafruit.com/>, and Sparkfun, <http://www.sparkfun.com/>. You can have at least as much fun poking around these sites as we used to have at computer shows.

Although the above dealers carry books, you can probably save money by buying them from on-line book dealers such as Amazon, and many large brick-and-mortar bookstores have several publications on the device.

# Dayton Microcomputer Association Membership Form

Today's Date: \_\_\_/\_\_\_/\_\_\_  
(dd/mm/yyyy)

**New** Please credit the DMA member who recruited you:

**Renew** Please list below any *changes* to your contact information.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone (landline or cellular): (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

E-Mail: \_\_\_\_\_@\_\_\_\_\_.

### Skills or interests you can share with DMA:

✓ \_\_\_\_\_

✓ \_\_\_\_\_

What do you hope DMA can provide you? \_\_\_\_\_

### TYPES OF MEMBERSHIP:

**Regular** (\$25.00 annually) .....

**Associate** (\$12.50 annually—For someone living at the same address as a Regular Member.) .....

**Student** (Free—For full-time students through 22 years of age. Student members *cannot* vote in DMA elections.).....

**SHELL ACCOUNT:** A Shell Account on the DMA server provides file storage, hosting of a personal noncommercial Web site, and a DMA1.org e-mail alias (forwarding address), all for a *one-time* fee of \$10.00. A user name must be no more than eight alphabetic characters. The usual default is your last name and first initial, with no caps or punctuation (for example, jsmith or sjones). DMA reserves the right of final decision on all user names. ....

First choice: \_\_\_\_\_ Second Choice: \_\_\_\_\_

**TOTAL** ..... \$ \_\_\_\_\_.

Make checks or money orders payable to DAYTON MICROCOMPUTER ASSOCIATION, and mail this Form and your payment to: **Post Office Box 4005 Dayton, Ohio 45401.** (At this time, we can only accept payment by credit cards at meetings.)

### DMA USE ONLY:

Member# \_\_\_\_\_ Exp. \_\_\_/\_\_\_/\_\_\_  Check# \_\_\_\_\_  Cash Processed by: \_\_\_\_\_

Member# \_\_\_\_\_ Exp. \_\_\_/\_\_\_/\_\_\_  Check# \_\_\_\_\_  Cash Processed by: \_\_\_\_\_

Member# \_\_\_\_\_ Exp. \_\_\_/\_\_\_/\_\_\_  Check# \_\_\_\_\_  Cash Processed by: \_\_\_\_\_