Commodore
Users Group
of
Saskatchewan

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Vol. 4 No. 4

THIS MONTH
The Evolution of Games
and
CUGS Software Sell-Off

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If you have any questions about CUGS please feel free to contact any of the above executive members.

The MONITOR is published monthly by the COMMODORE USERS' GROUP OF SASKATCHEWAN (CUGS), Regina, Sask., Canada. CUGS meetings are held at 7 pm the SECOND WEDNESDAY of every month (unless otherwise noted) in the North-West Leisure Centre, corner of Rochdale Boulevard and Armanon Street.

Anyone interested in computing, especially on the 64, 128 or 64C, is welcome to attend any meeting. Out of town members are also welcome, but may be charged a small ($5.00) mailing fee for newsletters. Members are encouraged to submit public domain software for inclusion in the CUGS DISK LIBRARY. These programs are made available to members. Any member is entitled to purchase DISKS from our public domain library for a nominal fee. Programs are 'freeware', from computer magazines, or the public domain. Individual members are responsible for deleting any program that he/she is not entitled to by law (you must be the owner of the magazine in which a particular program was printed). To the best of our knowledge, all such programs are identified in their listings. Please let us know if you find otherwise. Contact Earl Brown, 727 Rink Ave.

CUGS is a non-profit organization comprised of 64, 64C, C128, and 128D users interested in sharing ideas, programs, knowledge, problems and solutions with each other. The more members participate, the better the variety of benefits. Membership dues are pro-rated, based on a January to December year.

CUGS MEETING WEDNESDAY - APRIL 12, 1989
NorthWest Leisure Centre
7:00 pm
AGENDA
1. Club Business
2. GAMES
   An examination of the major divisions of games and a look at some samples from each of these divisions.
3. Questions/Problems
4. Prize Draw
   (Joystick donated by Software Supermarket)
5. Sale/Trade of equipment, software, books, etc.
   8:30 - 9:00

Each person selling or swapping equipment will be responsible for their own materials. Only original software can be placed for sale or trade (no copies allowed).

This issue is dedicated to the serious fun side of the 64/128 family. About 5 years ago "Big Blue" took on the home market with its ill-fated PCjr (Dubbed "the peanut" by some). While the Jr. provided little competition to the then-established home computer market (Apple-Commodore-Atari) the entry of IBM into the realm of low-cost computing had an interesting effect on those already in the market.

Up to that point, Apple, Commodore and Atari were primarily interested in who could provide the best graphics and games. IBM brought with it the aura of respectable business machine, and it was the business world that latched on to the IBM (later generic MS-DOS) machines. What followed was a furious flurry by all the "home" computers to prove their viability in the business marketplace. The "big 3" of home computers spent fortunes showing how their computers could do all that "blue" could ... and gave you other possibilities (like good ol' game-playin' fun!).

With the established reputation of IBM, MS-DOS has become a virtual business industry standard. Other pretenders to the throne (CP/M, Unix or Xenix) still float in the realm of the "really big" computers used in major institutions and mainframes - MS-DOS has become the champion of the small business looking for dependable computing power. Setting aside the arguments against such a coronation, it HAS happened. If you're a businessman looking for a business machine, you buy an MS-DOS machine - period. The remaining companies have returned to promoting their machine in the home and educational markets, touting graphics, ease of use, flexibility and speed as "buy me" arguments.

The truth is, I haven't met too many people that have fun with business software. The home market generally means Dad (and an occasional Mom) and the kids with the emphasis on the kids. And kids (of all ages) love GAMES! Ergo, at the heart of every home computer purchase you will find one "legitimate" reason (wordprocessing, data filing, spreadsheet work) and GAMES. I've never spoken to a home computer owner (ANY machine) who doesn't list GAMES as the number 2 or 3 reason for the purchase!

And why not? Since when is having fun such a shameful thing? Especially when a lot of the fun you can have with a computer can even have educational spinoffs. No, I'm not going to elaborate, except to say that even a space-age "shoot-em-up" develops small motor dexterity, and GAMES HAVE COME A LONG WAY SINCE THEN, BABY!

So we pay tribute to GAMES, games on the 64/128. This issue will examine their genesis and growth. Our meeting will show you everything from one of the earliest computer games to one of the most recent. So, 64/128-ers, don't be "closet gamers"! Admit it! You love 'em, and you own one of the BEST DOLLAR-FOR-DOLLAR game machines on the market. Celebrate Games with C.U.G.S.
The Prez Sez.....................

This month's meeting is the very first one that has been devoted to games. Although the C64 is one of the best (if not the very best) game machine around, we have not spent any meeting time examining games. This meeting is a departure from our previous history of looking at the productivity aspects of our machines.

Various club members will try and show the different types of games there are and also how and why they are different. For the purpose of this meeting we have arbitrarily divided the types of games into the following categories: simulation games, role playing games, text adventure games, arcade games and board/card games. If you think that this list was derived without some interesting discussions at the executive meeting, well, think again. As it turns out, a number of games are very difficult to classify and one person's adventure game is another's role playing game.

I would like to thank SOFTWARE SUPERMARKET for donating the Epyx 200KJ JOYSTICK for today's prize draw! I have to admit that I tried it out and it works super - even for me who has great difficulty shooting anything that moves.

Since spring has finally arrived, it is time to start spring cleaning. Next month, we will look at maintaining our equipment with special emphasis on cleaning the computer keyboard and a special session on repairing joysticks. I think that this meeting should be a very rewarding session for everyone.

Over the Easter long weekend my wife and I travelled to Mint for some shopping. I found every software (and hardware) seller I could who supported the C64/128 and I came back with zilch! (sorry, I lied - I did buy the RUN Special Programming Issue for the equivalent of $4.70 Canadian). When exchange is added on, except for a couple of cases, the software is as expensive or more expensive than right here in Regina. I also found that there was very little productivity software available and the games selection is not as good as it is locally.

Enough rambling - I'll see you next issue.

Meeting Place

CUGS holds a regular meeting once a month during the months January - June and September - December at the NorthWest Leisure Centre.

Currently meetings are held on the SECOND Wednesday of each month at 7:00 pm.

The meeting dates up to June are listed below. Please write these on your calendar.

CUGS MEETINGS - MARCH - JUNE 1989

April 12
May 10
June 14

Meeting times are 7:00 - 9:00 pm

All meetings are held at the NorthWest Leisure Centre (Room #1)

Experts, II

Last issue we began what we hope will be a regular service to our membership. The people below have agreed to let their names be listed as "experts" in some aspect of C64/128 computing. If you've a question, these brave volunteers can likely answer it, or help you find an answer that works. If YOU have a skill at some computing process, consider listing yourself with our other volunteers. We're all in this together!

Wordprocessing:
- Paperclip III - Shaun Hase - 584-3371
- Paperclip (to version E) - Richard Maze - 586-3291
- Paperclip (any version) - Ken Danylcuzk - 545-0644

Spreadsheet:
- Multiplan - Richard Maze - 586-3291
- Pocket Planner - Barry Bircher - 359-1925
- Better Working SS - Ken Danylcuzk - 545-0644

Databases:
- Pocket Filer - Barry Bircher - 359 1925
- Oracle (Consultant) - Ken Danylcuzk - 545-0644

Communications:
- Pro-128-term - Barry Bircher - 359-1925
- Library files - Barry Bircher - 359-1925

Music/Sound:
- (most) - Ken Danylcuzk - 545-0644

Languages:
- Fort - Ken Danylcuzk - 545-0644
- Pascal - Ken Danylcuzk - 545-0644
- ML (machine language) - Ken Danylcuzk - 545-0644
- ML (machine Language) - Barry Bircher - 359-1925
- BASIC (general) - Richard Maze - 586-3291
- BASIC 3.0 (graphics) - Shaun Hase - 584-3371
- BASIC (2.0-7.0) (files) - Ken Danylcuzk - 545-0644

Graphics:
- Print Shop/Master - Ken Danylcuzk - 545-0644
- Koala Painter/Printer - Ken Danylcuzk - 545-0644

Hardware:
- All hardware - Tyler Rosewood - 525 0214
- Disk Drive Maint. - Ken Danylcuzk - 545-0644

GDEOS:
- GDEOS 2.0 and 128 - Tyler Rosewood - 525 0214
- ??????????????????
On Feb. 27, 1989, C.U.G.S held one of it's most memorable meetings of the year which highlighted the new era in understanding life with a computer. (If you believe that, then you were not there.) We did do some interesting things, like programming a quick way to fill the screen with a character, and programming a way to print out a message in M.L. I demonstrated the techniques while the six SIGlias who were there sat in bemusement. I learned that teaching looks easier than it really is. I hope to make up lost ground by including in this article what we did that night. If those people did their homework, they should be able to follow through.

Inside the CPU (Central Processing Unit) are registers or workhorses. Although there are more, we will concentrate on only four of these. The first and most important is the Accumulator. In this register, all the math functions take place. There are two other similar registers called the index registers, named X and Y. These differ from the Accumulator in the way they are used by some commands understood by the CPU. The last workhorse, the STATUS register, is the one that is often misunderstood or forgotten. It is with this register that some of the commands used in M.L. "compare" with some action that took place microseconds before. Some of these commands are BBE (Branch if Equals) BNE (Branch if Not Equal) and CMP (Compare). With these registers, you will be able to do 99% of what is needed in a M.L. program.

The processing in the CPU involves three simple steps: retrieve a byte from memory, do something to it and store it back to a memory location. In our exercise on Feb. 27 of filling the screen with a character, all we were doing is loading the Accumulator (LDA) with a value and storing it to four memory locations at the same time. These memory locations correspond to the screen's memory, thereby making it appear on the screen. The following BASIC program illustrates the procedure:

```
10 A$=CHR$(81) REM or any other CHR$(x)
15 Y=0
20 PRINT$;PRINT$;PRINT$;PRINT$;
30 Y=Y+1 IF Y>255 THEN Y=0
40 IF Y<0 THEN GOTO 20
50 RETURN
```

In M.L., we would code it like this (in L.A.D.S, Label Addressed Development System, form):

```
10 * $1300
30 .S
40 .O
50 .D PRINT PRINT1
60 SCREEN = $0400
70 SCREEN1 = $0500
80 SCREEN2 = $0600
90 SCREEN3 = $0700
100 LDA #81
110 LDY #0
120 NOTDONE STA SCREEN,Y
```

Most assemblers need to know where to start its assembly. Line 10 tells the assembler to start at 1300 hex, or 4864 decimal. Lines 30, 40 and 50 are assembler instructions telling it to display what it is doing when it is assembling, to Output the Object code to memory and then save the code to disk under the file name of "print11". The first file name in the program is the name of the first file the assembler will load in to assemble. This will make more sense later on when you have more than one file to assemble because it automatically loads the files for assembly.

Line 60 shows a technique that allows you to name, or assign labels to memory addresses. This aids in programming considerably. Now, every time you see "SCREEN" you can assume it is address 0400 hex, and "SCREEN1" will be 0500 hex and so on. Lines 155-160 set up the program loop (can you tell where it starts and ends?). How can you increment Y and then check for a 0? Does this not execute indefinitely? No! you should remember that the registers can only count up to 255 decimal or FF hex. When Y is at 255 and the instruction INY takes place, it rolls back to the next number of 00 hex. So when we INY 256 times, we end up at 0 again and we check this with BBE (Branch if Equals to zero) and branch to "EXIT".

Note that we used "EXIT" as an address. When programming we do not usually know EXACTLY where the RTS will end up in actual memory. We simply give it a name to it ("EXIT" seems to fit nicely) and just refer to it by name. Take a look at the "NOTDONE" label. Can you follow what will happen when we get to line 180? If so, you are well on the way to getting to know your C= 64/128.

For those of you without a label type assembler, I have included a screen display of a monitor disassembly. Try and see if you can understand the following monitor disassembly for the above source code.
ON WITH THE GAMES

by Ken Danylcuk

(In your best Rod Serling voice) Imagine, if you will, a university campus somewhere in the U.S.A. A nice, quiet campus with many stone buildings housing classrooms, corridors and labs, chemistry labs, physics labs, and... something new and little understood --- a room containing massive electronic equipment -- one of the first electronic program calculators -- a computer. The year is 1962, and there's no such thing as a "personal computer". In fact, the closest you might come to one in this day and age is this facility at M.I.T. This is the birthplace of all computer language -- flowchart, printout, program, the first "hackers" worked here, many computer languages had their humble beginnings here, especially BASIC, designed to give the "common man" a vehicle to communicate with the new technology. It is not surprising, then, that here we find the birthplace of the very first computer GAME. Remember, we're talking about a hulking roomful of equipment connected to a paper tape reader, with a crude telepype terminal for limited entry, and very limited access. The machine was SUPPOSED to be for use by the science and mathematics departments on campus. But the computer led a double life by day a staid, compliant scientific calculator; by night the playground of the computer "freaks". Under and post-grad students from the science and math departments were fascinated with the potential of the new technology. By 1972, the card reader "clunker" was replaced with a slick new keyboard with VIDEO terminal -- you could interact with the computer much more easily. In this "Erlen" was born "SPACE WAR" -- THE FIRST INTERACTIVE COMPUTER GAME.

"SPACE WAR" was written more as an exercise in shared programming than as an entertainment. Everyone with access to the lab was at liberty to follow the program logic, add amendments and upgrade the game, or just play it. Played on a teletype terminal, it BEGAN as a TSTX game, requiring typed input from the user, who then received typed back information showing the results of his/her input. In simpler form, this is the TSTX game we know today, although more sophisticated machines have made the games faster, easier to play and more colourful, with graphics and sound accompaniment. Slowly, with "hack" upon "hack" the clique of computer geniuli embellished the graphics of SPACE WAR until it nearly resembled a crude arcade game.

Although the games did not progress quickly beyond the typed text with crude "bloppy" graphics, they encouraged the true early "hacker" to continue efforts to make this new technology accessible to all. A dividend of their efforts was the development of the "personal computer", an idea beyond the imagining of the mainframe magnates of the day, but a dream driven to reality in the hearts of the brilliant young "hackers" who kept the monster machines humming. Virtually every one of the early "hacker" computers was the product of a "crafter" using computer "hackers" weaned on Fortran, BASIC and true binary programming. The new (personal) machines brought computer POWER to the public, and with that power came a fascination with PLAY. Companies after company grew out of the efforts of these early "hackers" to provide fodder for the new machines, and a lot of that "fodder" was pure joyous entertainment -- GAMES.

COMMODORE entered the personal computer market with the PET (Personal Electric) in 1976. The PET around 1976 came with the built-in BASIC compiler which contributed to the growth of GRAPHIC games. Early geneology of games MUST pay tribute to both ADVENTURE, which spawned an entire family of modern gaming, and STAR TREK, obviously named after the popular television show. The games played by a "core" of programmers today had the added advantage of crude (but effective) GRAPHIC representation of the playfield. Also early in the career of the PET, popular board games were moved to the blinking screen. They were easy to convert, because the rules were obvious and clearly definable, and everyone enjoyed them. They allowed simple graphic displays for effect, and were meant to provide a single human with a COMPUTER OPPONENT. This was a remarkable diversion, because early computer games involved other operators as the "opponents".

Around the early 70's, North America's fascination with video games peaked with the flowering of "Pong" games of every sort sold to homes, bars and lounges across Canada and U.S. These games were little more than dedicated computer chips attached to video terminals, and led naturally to program controlled computer chips INSIDE home computers. The PET had a proliferation of "Pong"-style games available, which led to an intriguing variety of computer games allowing both other human AND computer adversary games such as "Space Invaders", "Lunar Lander", or "Breakout". Sensing the call of the marketplace, Apple, Atari and Commodore turned their attention to the homes of North America as potential customers. Home video games with crude graphics and simple motor-skill challenges were a hit! There NOGIG to be a market for a machine that would allow you to play ANY GAME YOU WANTED, even WRITE YOUR OWN! The battle for computers in the homes of the land began. Commodore's opening volley was the mighty VIC 20. 3 voice tone generators and multicolor which displayed and played on the family tv set with excellent clipping. With BASIC on board, and expansion busses open to public use at one third the price of an Apple, the VIC was touted as the "Volks-computer" (by none other than Captain Kirk himself), the "friendly" computer, with great productivity and GAME software were their major (successful) thrust. They made "America" believe that they ought to have a VIC 20 (or at least some computer) in their home. And they did.

Because the machine carried BASIC in ROM, early games made use of these facts, and appeared slow; because the machine had a "built-in" graphics character set, they were the basis of graphics in the compiler, resulting in limited and crude. Programmers soon learned to use machine code to tap the power of the machine without extending memory, and, in the short (4 year) life of the VIC we see the passage from the second to third generation of game. Early VIC games were little more than re-writes of previous PET material, and had little new to offer but a little brighter colour and perhaps enhanced sounds. Gradually VIC games (written for the VIC) began to appear, and we see colour graphics using altered characters, with recognizable 3-part tunes as accompaniment. The VIC has its character set read from RAM, which made it possible to create unique fonts or strange little characters in place of the usual computer ones. We see the rise of "arcade" games, games similar to ones found in a new North American phenomenon -- the electronic game arcade. Software developers began to simulate and copy any video game available, translating it to commands the VIC could manage. Games like "Space Invaders" and "Pacman" (as well as numerous clones) appeared and were welcomed by a new host of computer users: the computer gamer, owner (average age - 25, mid-income family man).

Gradually, "family lines" of computer games came into focus -- the TEXT/ADVENTURE game (with its cousin, the MACHTOY) the ARCADE game, the BOARD/CARD game, and the SIMULATION game. For the ARCADE games, storylines were rather clear-cut, but, as the machines matured so did the refinements to the games, and the lines of distinction blurred, even to today.
Just as games on the VIC were entering the realm of the reasonably sophisticated, involving hi-res plotting, multi-colour, use of extra memory, and ML programming, Commodore took steps to counter the moves of its competitors to provide machines with more memory - it introduced the 64!

With the 64 Commodore was to become the undisputed "king" of home computers, and with a rapid growth to 2.3 million machines in homes within 2 years, software (read "game") companies increase in number AND output. Virtually every game imaginable will become available for the 64 over the course of the next 4 years. Here we see a sort of creative evolution of games, to the present day, when we have games that would be considered impossible appearing for the 64. And the "family lines" begin to mix again, creating considerable dilemma for computer paper and magazine editors who love to categorize things neatly.

True to form, early games for the 64 appeared quickly, first "remakes" of PET games, progressing to VIC "rewrites" and simple keyboard graphic games. Eventually, programmers learned to tap the hi-resolution colours of this incredible game machine, including multi-colour modes (16 colours, 4 within a single character area!!!). Because the 64 had sprites (easily moveable screen objects), early high-quality games tended to make heavy use of sprites moving about the screen, extending what was thought to be an 8 sprite limit to 16 or more at one time. With the extensive (for the period) memory available, page-flipping animation was one excellent technique for producing movement within graphic games, and scenes added to TEXT/ADVENTURE types. The plentiful memory combined with a true SYNTHESIZER chip to allow exceptional sound effects and musical accompaniment (sometimes more interesting than the game to be played).

Once the fascination with flashing, zipping sprites bounding every which way, it became evident to the software industry that gamers were looking for more than a 2 minute shoot 'em up thrill. Motor skill tests were a fun release, but to "keep 'em coming back" the game had to have content - a story, and test the players mind as well as muscle. Thus, a blend of action game and text-type adventure or puzzle became common over the last couple of years. Simulation, especially skill simulation, also blossomed this past year or two. Through the magic of computing you have the thrill of flying virtually any aircraft made by man. You can play any position on any sport team, often competing (safely) against a simulation of the skills of a master at the sport (Larry Bird, Bjorn Borg, etc.), or compete in tournaments of every imaginable type from the Olympics to a major golf tour. There are even programs to allow the amateur to design his own arena or adventure-type game, by merely defining the action in English-like command lines.

This is my tenth year as a computer friend. I've owned and used a full genealogy of games. What follows is a "family tree" of computer games. It would be impossible to list every game, but I have tried to illustrate each branch of the tree with a few programs, some of which you might identify, giving you a feeling for the gradual maturing of gaming on the 64.

Where to next? "We've pushed the machine about as far as it can be pushed", was a quote that seems likely at first glance, until you realize it was a quote from a programmer in 1984, commenting on the graphic excellence of his game. Just when it seems that the limits have been reached, someone finds a way to push a little harder, much to the delight of the gaming public. Game development on the 64 has probably peaked, but not necessarily because the limits have been reached. Rather, it is because programmers are turning their attention to the expanding base of AMIGA users, a machine allowing far superior graphics, colour and sound, with unbelievable memory. No one can serve two masters equally, so, with the shifting attention to the more dramatic graphics of machines of the 90's, less progress is allowed the machines of the 80's, of which our beloved 64 is the major force. With what is still the largest home computer user base, the 64 will still provide programmers with good income for many years to come. Game on, brave 64'er, game on!

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Thanks to Bart at Software Supermarket for donating the prize draw for tonight!

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Hard-Wood-Ware

by Steve Bogues

This is the fifth design in a series of plans for computer desks intended for home users. This design has a number of useful features, such as:

- a slide-out top shelf with room for two 1541/1571/1581 drives.
- room on desktop for monitor.
- lowered slide-out shelf for keyboard.
- a pull-out printer shelf with paper tray.
- casters for easy movement.
- two 18" doors may be installed with piano hinges (lock may be included in door).
- compact design.
The up arrow is the preferred choice because it is located right beside the asterisk (*) on the keyboard. If you rename more than one program file on the disk with the up arrow as the first character in the title, then of course the first one listed in the directory is the one loaded from disk using the above load command. You would have to include another letter or two in your load command to make the program name more specific. For example, if you titled a program 'up arrow/destem' and it was not the first file on the disk with the [up arrow] prefix, then you could use:

```
load"[up arrow]\d*",8;
```

If you want the program to load and run after you typed in the colon, simply hold down the shift key as you press the run/stop key. That's all there is to it. See you next month.

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**NEW CUGS DISKS**

If you are claiming relative equivalents in the Federal Sales Tax Credit (Schedule 8, line 20) then the value of $0 must be corrected. The line should read:

```
683 w0=35:input"[yellow]no of qual relations(582)";r
w3=r-w0
```

Most of us are not affected by these two errors, but those of us that are should make the necessary changes to the program and to your Income Tax returns.

There is one tiny mistake in the 'print program' file as well. This affects the printout of Schedule 1 - Detailed Tax Calculation. The BASIC FEDERAL TAX should be line 506 and not 505 as printed out. Make the following line change to the program if this bothers you.

```
1062 print" basic federal tax (506) " ; : ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;;