PERL

Practical Extraction and Report Language

Programming examples but in text form as opposed to graphics

Primarily using ActiveState from:

www.activestate.com/activeperl

and nothing more involved than the Windows notepad or wordpad editors, and double clicking the hDial.pl or vDial.pl resulting programs. ActiveState was chosen as it was simple, installed, and worked first time. THEN after basic experience was gained, then the IDE was used; note that the IDE does not display prompts (for latitude etc) until after the inputs are entered!!.

Strawberry Perl was not used as it did not offer benefits over ActiveState, and seemed to be too Unix oriented.

please check regularly for updates at:

www.illustratingshadows.com/b3/programmingShadows.pdf

which has excellent hints for Perl and the IDE

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www.illustratingshadows.com
January 11, 2014

TWO CHOICES…

StrawberryPerl

or

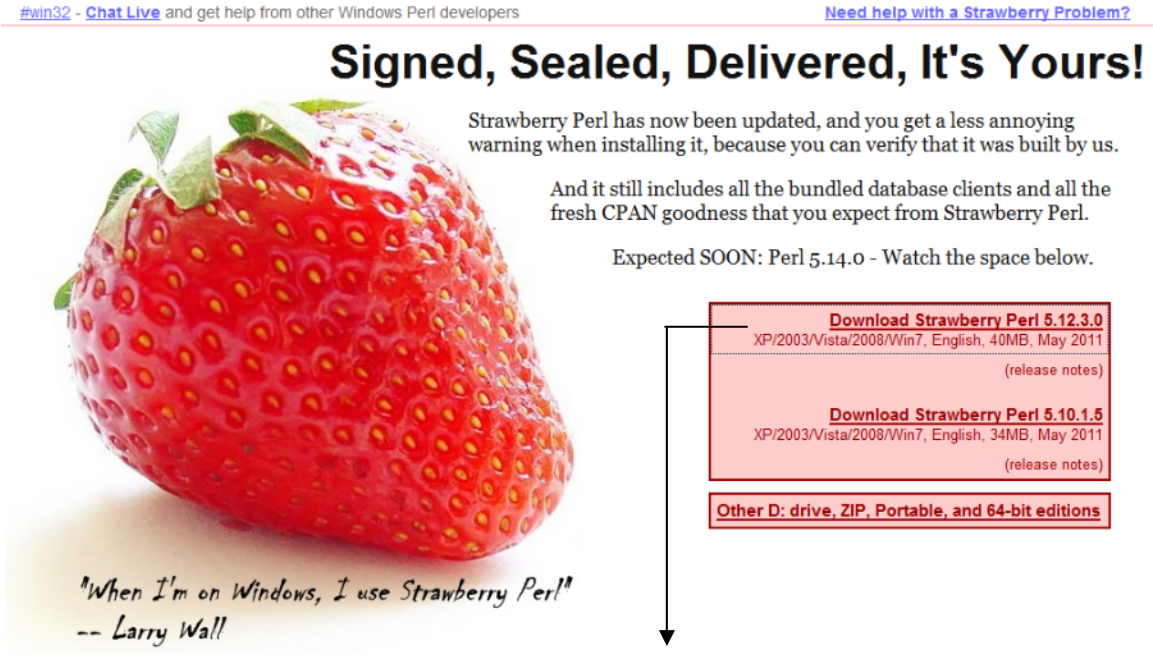
ActiveState

I chose ActiveState, it installed first time, had the additional libraries (math, GD, etc) and worked. And the IDE choses also worked with it well.

PERL programming ~ StrawberryPerl ~ I did not use this, I used ActiveState instead

http://www.perl.org/get.html

http://strawberryperl.com/



strawberry-perl-5.12.3.0.msi

Strawberry Perl 5.12.3.0 README
==========

What is Strawberry Perl?
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* 'Perl' is a programming language suitable for writing simple scripts as well
  as complex applications. See http://perldoc.perl.org/perlintro.html

* 'Strawberry Perl' is a perl enviroment for Microsoft Windows containing all
  you need to run and develop perl applications. It is designed to be as close
  as possible to perl enviroment on UNIX systems. See http://strawberryperl.com/

Installation instructions: (.zip distribution only)
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* If installing this version from a .zip file, you MUST extract it to a
  directory that does not have spaces in it (referred to as <directory>
  below) and then run some commands and manually set some environment
  variables:

  cd <directory>
  perl\bin\perl.exe relocation.pl.bat
  perl\bin\perl.exe update_env.pl.bat

(You can specify " --nosystem" after update_env.pl.bat to install Strawberry Perl's environment variables for the current user only.)

* If having a fixed installation path does not suit you, go to http://strawberryperl.com/releases.html and try "Strawberry Perl Portable Edition"

How to use Strawberry Perl?
---

* In the command prompt window you can:

  1. run any perl script by launching

     c:\> perl c:\path\to\script.pl

  2. install additional perl modules (libraries) from http://www.cpan.org/ by

     c:\> cpan Module::Name

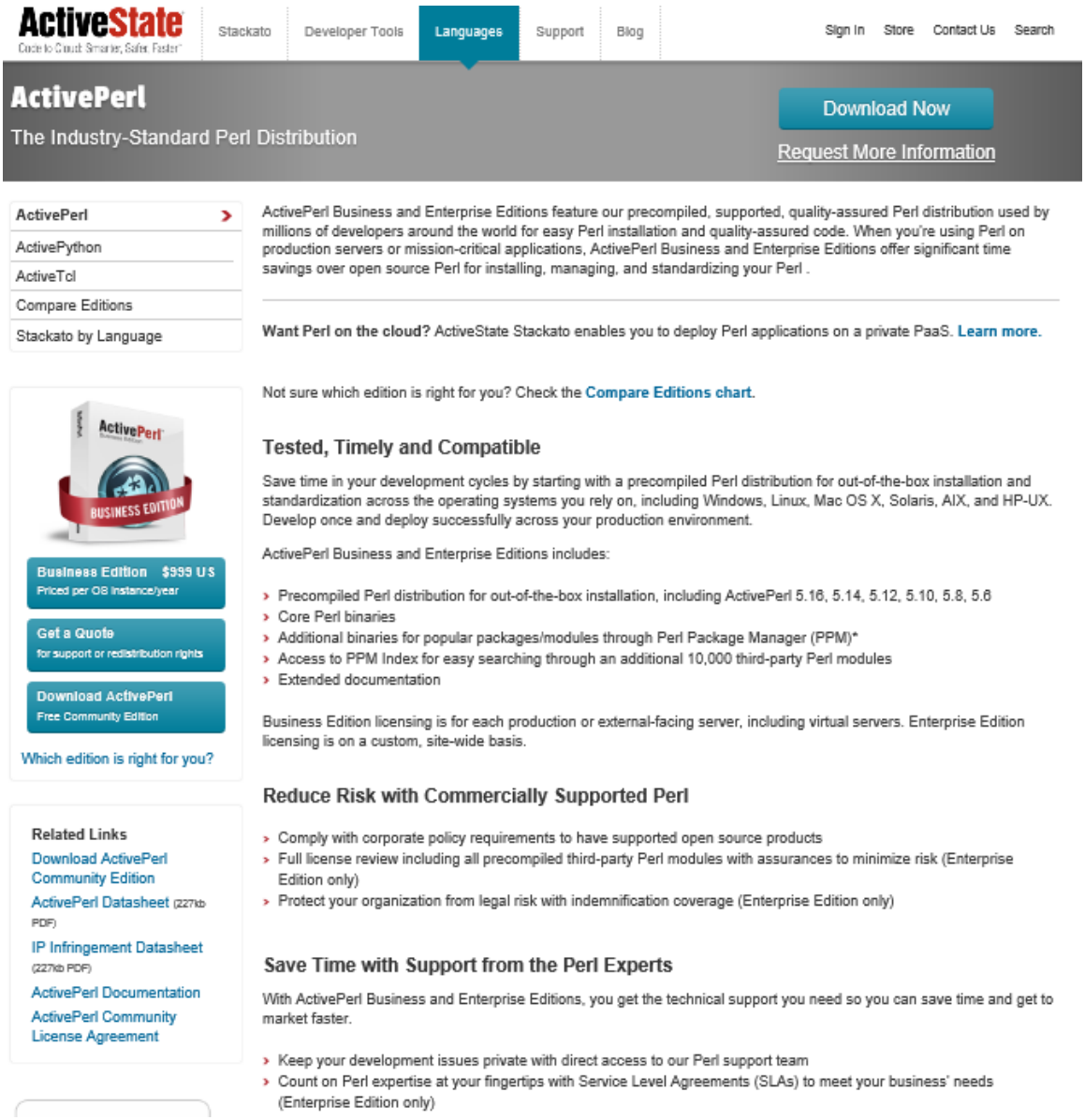
  3. run other tools included in Strawberry Perl like: perldoc, gcc, dmake ...

* You'll need a text editor to create perl scripts. One is NOT included with Strawberry Perl. A few options are Padre (which can be installed by running "cpan Padre" from the command prompt for 32-bit versions) and Notepad++ (which is downloadable at notepad-plus.sourceforge.net), which both include syntax highlighting for perl scripts. You can even use Notepad, if you wish.

PERL programming ~ ActiveState ~ I used this, I did not use StrawberryPerl

OR . . .

www.activestate.com/activeperl



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- Ensure maximum uptime for your business-critical applications

Extended Platform and Version Support

ActivePerl Business and Enterprise Editions extend your ability to develop applications for the following additional operating systems: Solaris, AIX, HP-UX.

Plus, get access to older Perl versions across all platforms:

- Convenient, worry free access to ActivePerl 5.16, 5.14, 5.12, 5.10, 5.8 and 5.6
- Benefit from the ability to test your products against any version release

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Community Edition

Free

Support through community only

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Email support**

2-day response time

1 technical contact

More Info

Enterprise Edition

Custom pricing

Unlimited phone/email support

2-hour response time***

2 technical contacts

More Info

For more details on which edition is right for you, see the Compare Editions chart.

* Module and platform availability vary by version and operating system. Please see PPM or search PPM Index for current module availability. Please contact ActiveState sales department for details on version and platform support for Business and Enterprise Editions.

** Business Edition includes support for build, installation, usage, configuration, and diagnosis dependent on ActiveState's

USING ActiveState from “www.activestate.com/activeperl“:-

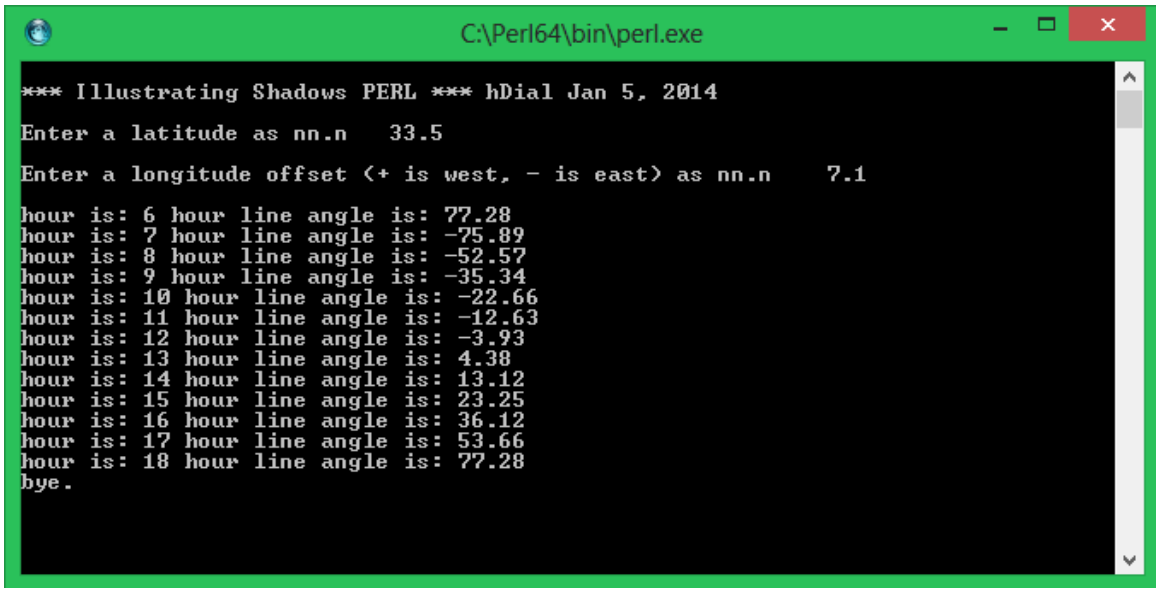
and documentation from

http://perldoc.perl.org/Math/Trig.html#TRIGONOMETRIC-FUNCTIONS

http://alvinalexander.com/blog/post/perl/reference-page-perl-printf-formatting-format-cheat-sheet

The following is a text only horizontal dial program

```
# A horizontal sundial with a longitude correction, text only
# www.illustratingshadows.com
# January 4, 2013

use English;
# http://perldoc.perl.org/Math/Trig.html#TRIGONOMETRIC-FUNCTIONS
use Math::Trig;              # needs "use Math::Trig;" as "atan2" is worthless
                             # also TAN is in math.trig, otherwise you must
                             # do sin/cos. But the big deal is TAN vs ATAN2

print "\n*** Illustrating Shadows PERL *** hDial Jan 5, 2014\n";

print "\nEnter a latitude as nn.n   ";
$latitude = readline(*STDIN);

print "\nEnter a longitude offset (+ is west, - is east) as nn.n    ";
$longitude = -readline(*STDIN);

$slat = sin($latitude*2*3.14159/360);

$hr=-6;
while ($hr<7) {              # NOTE: ctrl-C will break a loop in Windows 8

    # following does not need "use Math::Trig;" however, it is needed for ATAN etc
    # $hlaTAN = $slat ;
    # $hlaTAN = $hlaTAN * sin(15*($hr+($longitude*4/60)))*2*3.14159/360) ;
    # $hlaTAN = $hlaTAN / cos(15*($hr+($longitude*4/60)))*2*3.14159/360) ;

    $hlaTAN = $slat * Math::Trig::tan(15*($hr+($longitude*4/60))*2*3.14159/360);

    $hla    = atan($hlaTAN);  # needs "use Math::Trig;" as "atan2" is worthless
    $hla    = $hla*360/(2*3.14159);

    # http://alvinalexander.com/blog/post/perl/reference-page-perl-printf-
formatting-format-cheat-sheet
    print "\nhour is: " , $hr+12 ," hour line angle is: ";
    printf("%.2f", $hla);

    $hr = $hr + 1;
}

print "\nbye.\n";
$latitude = readline(*STDIN); # any old input to pause screen
# end #
```

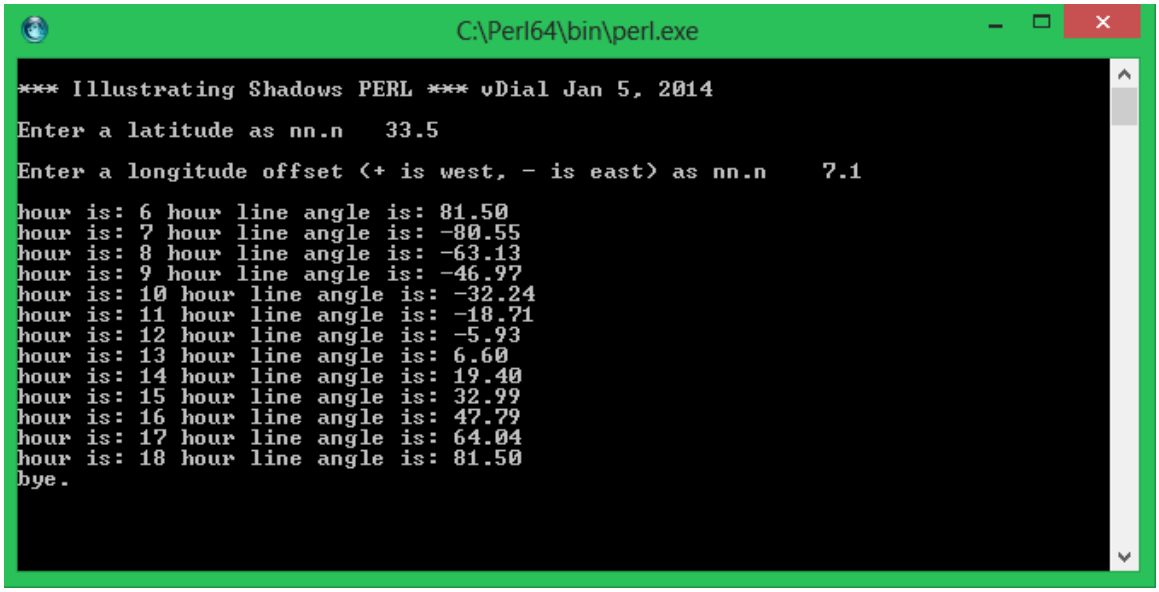


TIME OF DAY		Hour line angles for simple dials		Horizontal hour line angles with long corr	
am	pm	HORIZONTAL		am	pm
12.00	12.00	0.00		3.93	-3.93
11.50	0.50	4.16		8.18	0.22
11.00	1.00	8.41		12.63	4.38
10.50	1.50	12.88		17.41	8.64
10.00	2.00	17.68		22.66	13.12
9.50	2.50	22.95		28.56	17.94
9.00	3.00	28.90		35.34	23.25
8.50	3.50	35.73		43.25	29.24
8.00	4.00	43.71		52.57	36.12
7.50	4.50	53.11		63.48	44.17
7.00	5.00	64.10		75.89	53.66
6.50	5.50	76.58		89.28	64.74
6.00	6.00	90.00		-77.28	77.28
		These have no longitude correction		These have longitude correction	

USING ActiveState from “www.activestate.com/activeperl“:-

and documentation as before, the following is a text only horizontal dial program

```
# A vertical sundial with a longitude correction, text only
# www.illustratingshadows.com
# January 5, 2013
# converted from the hDial Perl program, see ... "# change here for h->v Dial"
notes

use English;
# http://perldoc.perl.org/Math/Trig.html#TRIGONOMETRIC-FUNCTIONS
use Math::Trig;              # needs "use Math::Trig;" as "atan2" is worthless
                             # also TAN is in math.trig, otherwise you must
                             # do sin/cos. But the big deal is TAN vs ATAN2

print "\n*** Illustrating Shadows PERL *** vDial Jan 5, 2014\n";

print "\nEnter a latitude as nn.n   ";
$latitude = 90-readline(*STDIN);     # changed to co-latitude

print "\nEnter a longitude offset (+ is west, - is east) as nn.n    ";
$longitude =  readline(*STDIN);      # remove "-" as moving from h->vDial

$slat = sin($latitude*2*3.14159/360);

$hr=6;                               # change here for h->v Dial
while ($hr>-7) {                     # change here for h->v Dial

    # following does not need "use Math::Trig;" however, it is needed for ATAN etc
    # $hlaTAN = $slat ;
    # $hlaTAN = $hlaTAN * sin(15*($hr+($longitude*4/60)))*2*3.14159/360) ;
    # $hlaTAN = $hlaTAN / cos(15*($hr+($longitude*4/60)))*2*3.14159/360) ;

    $hlaTAN = $slat * Math::Trig::tan(15*($hr+($longitude*4/60))*2*3.14159/360);

    $hla    = atan($hlaTAN);         # needs "use Math::Trig;"
    $hla    = $hla*360/(2*3.14159);

    # http://alvinalexander.com/blog/post/perl/reference-page-perl-printf-
formatting-format-cheat-sheet
    print "\nhour is: " , 12-$hr ," hour line angle is: ";   # change here for h-
>v Dial
    printf("%.2f", -$hla);           # change here for h->v Dial

    $hr = $hr - 1;                   # change here for h->v Dial
}

print "\nbye.\n";
$latitude = readline(*STDIN);        # any old input to pause screen
# end #
```



Latitude	33.5	Hour line angles for		Vertical hour line angles with long corr	
TIME OF DAY		simple dials			
am	pm	VERTICAL		am	pm
12.00	12.00	0.00		5.93	-5.93
11.50	0.50	6.27		12.25	0.33
11.00	1.00	12.60		18.71	6.60
10.50	1.50	19.06		25.35	12.94
10.00	2.00	25.71		32.24	19.40
9.50	2.50	32.61		39.43	26.07
9.00	3.00	39.82		46.97	32.99
8.50	3.50	47.38		54.87	40.22
8.00	4.00	55.30		63.13	47.79
7.50	4.50	63.59		71.72	55.74
7.00	5.00	72.19		80.55	64.04
6.50	5.50	81.03		89.52	72.65
6.00	6.00	90.00		-81.50	81.50
		These have no longitude correction		These have longitude correction	

PERL IDE

http://open-perl-ide.sourceforge.net/

Open_Perl_IDE_1.0.11.409.zip

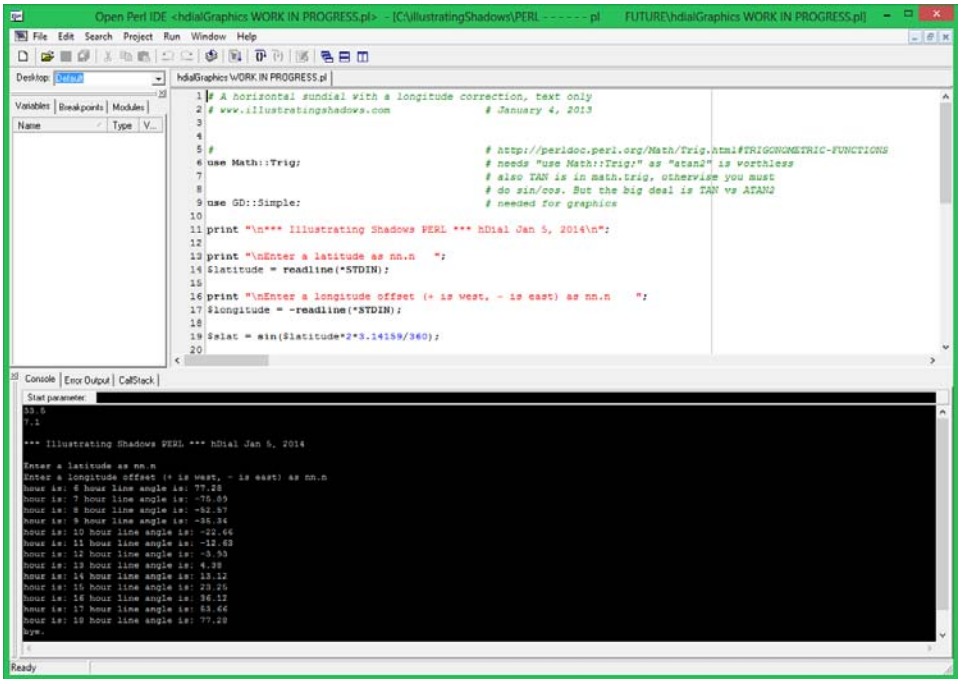
http://open-perl-ide.sourceforge.net/documentation/user-manual/usermanual.html

Debugging the hDial and vDial programs was done with the standard Windows Notepad or Wordpad programs. The files were saved and double clicked to run them. Syntax and other abnormal termination errors were hard to debug because the DOS screen in Windows 8 flashed up and vanished. So, an IDE would have been very helpful.

The IDE whose url is shown above installed easily. Start it with… **PerlIDE.exe**

It will load and then run Perl programs (or scripts if you prefer). However, the display of printing does NOT happen until after the INPUT values are read. So, you must do:-

33.5 <enter>
7.1 <enter>
<enter>



on blind faith, and then and only then do the results get displayed. This has the advantage that when problems occur, the “DOS window” does not flash by, instead, there is some help from the IDE.

*** END ***

Graphics and Perl ~ two choices, GD or TK

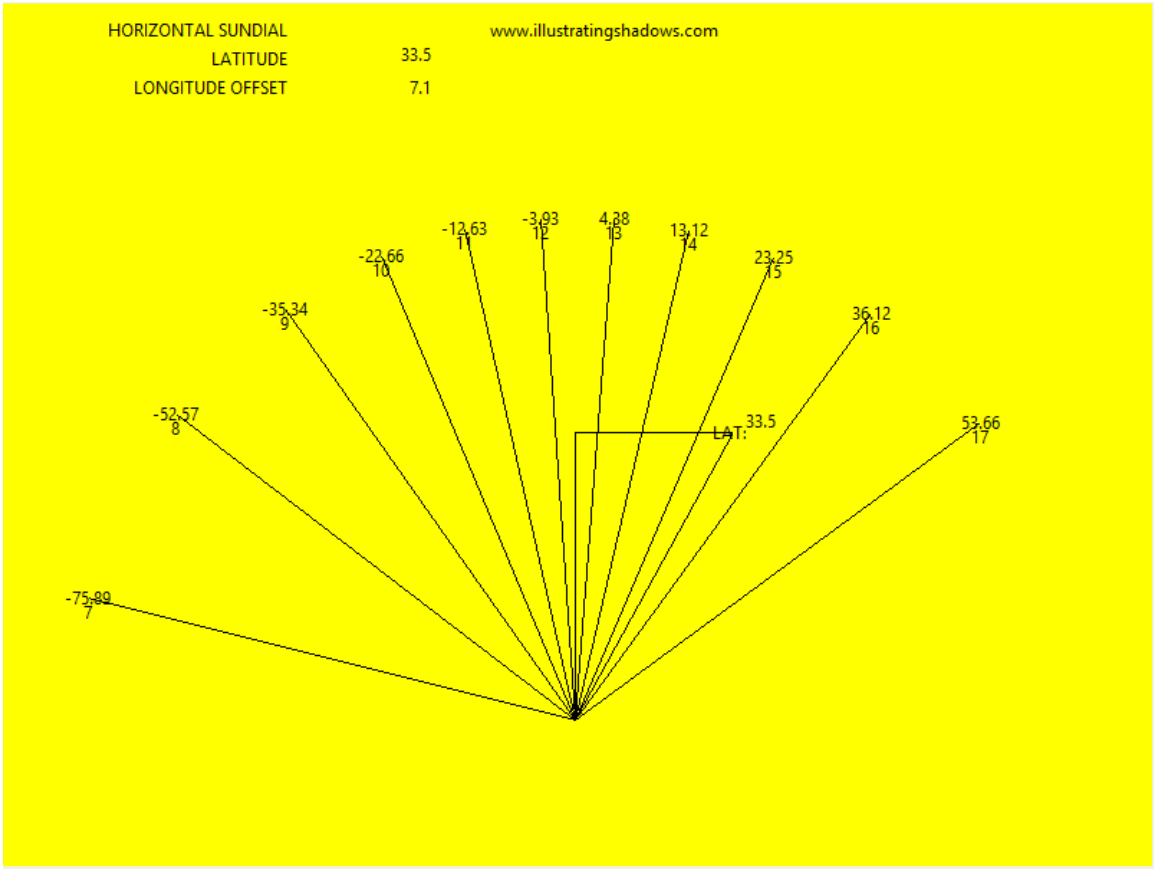
GD with GD, the primitives are simple but there is no easy way to display the output

http://search.cpan.org/~lds/GD-2.46/GD/Simple.pm
http://perl.about.com/od/packagesmodules/qt/perlgdsimple.htm
http://perl.about.com/gi/o.htm?zi=1/XJ&zTi=1&sdn=perl&cdn=compute&tm=36&gps=149_8_1327_699&f=00&su=p284.13.342.ip_&tt=13&bt=8&bts=8&zu=http%3A//search.cpan.org/%7Elds/GD-2.35/GD/Simple.pm

GD example code…

```
# http://perldoc.perl.org/Math/Trig.html#TRIGONOMETRIC-FUNCTIONS
use Math::Trig;                      # needs "use Math::Trig;" as "atan2" is worthless
                                     # also TAN is in math.trig, otherwise you must
                                     # do sin/cos. But the big deal is TAN vs ATAN2
use GD::Simple;                      # needed for graphics

    # REQUIRED FOR GD GRAPHICS TO WORK:   use GD::Simple;

    # create a new image
    $img = GD::Simple->new(640,640);

    # draw a red rectangle with blue borders
    $img->bgcolor('red');
    $img->fgcolor('blue');
    $img->rectangle(10,10,620,620);

    $img->moveTo(100,20);
    $img->font('Times:italic');
    $img->fontsize(18);
    $img->string('Horizontal Sundial');

    # # turtle graphics
    # $img->moveTo(320,600);
    # $img->penSize(3,3);
    # $img->angle(0);
    # $img->line(20);   # 20 pixels going to the right
    # $img->turn(30);   # set turning angle to 30 degrees

    $img->moveTo(320,600);
    $img->penSize(3,3);
    $x = 100;
    $y = 100;
    $img->lineTo($x,$y) ;

    # convert into png data
    # ######################################################## #
    # #  This is where I am stuck right now . . .           # #
    # ######################################################## #
    print $img->png;
    # write ("test.png", $img->png;);

print "\nbye.\n";
# end #
```

TK example code




```
use English;
#                              #
http://perldoc.perl.org/Math/Trig.html#TRIGONOMETRIC-FUNCTIONS
use Math::Trig;                # needs "use Math::Trig;" as "atan2" is worthless
                               # also TAN is in math.trig, otherwise you must
                               # do sin/cos. But the big deal is TAN vs ATAN2

print "\n*** Illustrating Shadows PERL *** hDial Jan 5, 2014\n";

print "\nEnter a latitude as nn.n   ";
$latitude = readline(*STDIN);

print "\nEnter a longitude offset (+ is west, - is east) as nn.n    ";
$longitude = -readline(*STDIN);

$slat = sin($latitude*2*3.14159/360);

# now start the graphics stuff
use Tkx;

$mw = Tkx::widget->new(".");
# http://www.tkdocs.com/tutorial/canvas.html
```

```
$canvas = $mw->new_tk__canvas(-width => 800, -height => 600, -background =>
"yellow") ;
$canvas->g_grid(-column=>0, -row=>0);


$canvas->create_text(200,20,-text=>"HORIZONTAL SUNDIAL",-anchor=>"e");
$canvas->create_text(500,20,-text=>"www.illustratingshadows.com",-anchor=>"e");
$canvas->create_text(200,40,-text=>"LATITUDE",-anchor=>"e");
$canvas->create_text(300,45,-text=>$latitude,-anchor=>"e");
$canvas->create_text(200,60,-text=>"LONGITUDE OFFSET",-anchor=>"e");
$canvas->create_text(300,60,-text=>-$longitude,-anchor=>"e");

$hr=-5;
while ($hr<6) {                             # NOTE: ctrl-C will break a loop in
Windows 8

    # following does not need "use Math::Trig;" however, it is needed for ATAN etc
    # $hlaTAN = $slat ;
    # $hlaTAN = $hlaTAN * sin(15*($hr+($longitude*4/60)))*2*3.14159/360) ;
    # $hlaTAN = $hlaTAN / cos(15*($hr+($longitude*4/60)))*2*3.14159/360) ;

    $hlaTAN = $slat * Math::Trig::tan(15*($hr+($longitude*4/60))*2*3.14159/360);

    $hla    = atan($hlaTAN);                # needs "use Math::Trig;" as "atan2"
is worthless
    $hla    = $hla*360/(2*3.14159);

    # http://alvinalexander.com/blog/post/perl/reference-page-perl-printf-
formatting-format-cheat-sheet
    print "\nhour is: " , $hr+12 ," hour line angle is: ";
    printf("%.2f", $hla);
    $thla=sprintf("%.2f", $hla);
    #
    $xc=400;
    $yc=500;
    $radial = 350;
    $y=$radial*cos($hla*2*3.14159/360);
    $x=$radial*sin($hla*2*3.14159/360);
    $canvas->create_line($xc,$yc,   $xc+$x,$yc-$y);
    $canvas->create_text($xc+$x,$yc-$y,-text=>$thla);
    $canvas->create_text($xc+$x,$yc+10-$y,-text=>(12+$hr));

    $hr = $hr + 1;
}

# draw gnomon
    $canvas->create_line($xc,$yc,         $xc+0,$yc-200);
    $x = 200*sin($latitude*2*3.14159/360);
    $canvas->create_line($xc,$yc-200,     $xc+$x,$yc-200);
    $canvas->create_line($xc,$yc,         $xc+$x,$yc-200);
    $canvas->create_text($xc+$x+10,$yc-200,-text=>"LAT:",-anchor=>"e");
    $canvas->create_text($xc+$x+30,$yc-200,-text=>$latitude,-anchor=>"e");

Tkx::MainLoop();

print "\nThe End\n";
```