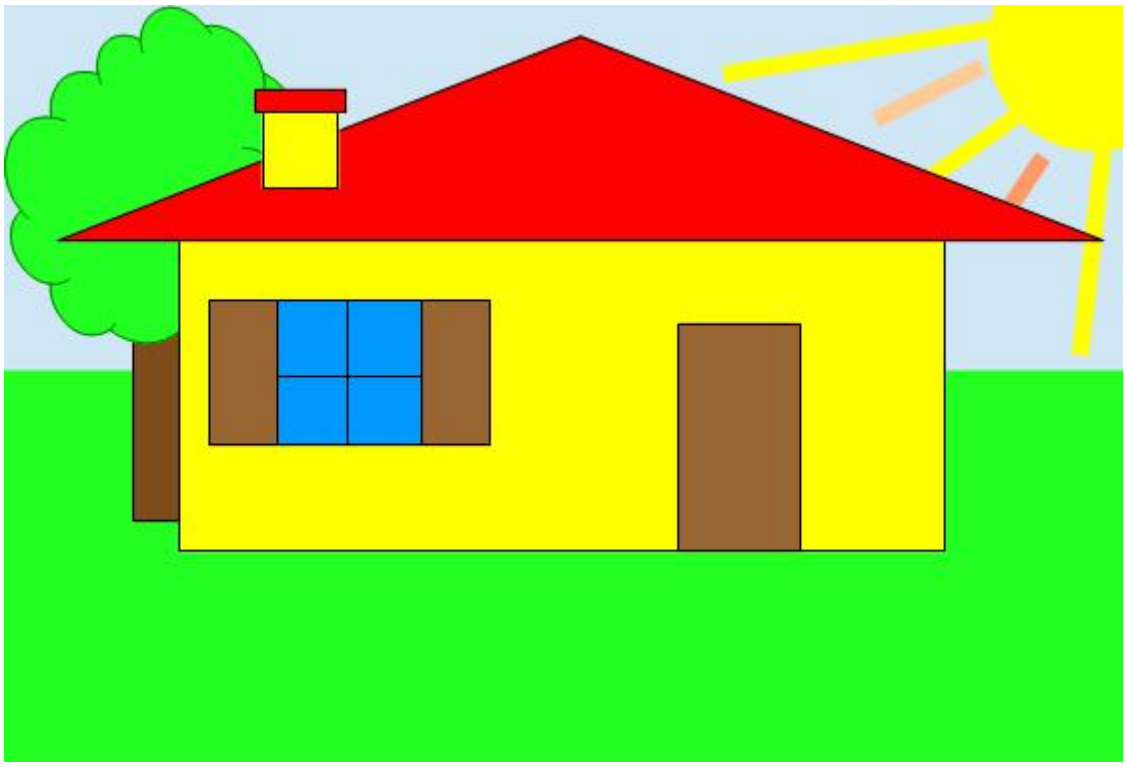
TUTORIAL

LET'S DRAW
A LITTLE HOUSE PROJECT



Tutorial by Claudio Guarnieri

Introduction

This tutorial is mainly for people who have at least a little knowledge of LibreCAD commands, but even people who don't know this program, with a bit more patience will find useful this tutorial. In these pages we will learn how to draw a simple house project with the version 2.0.0 of LibreCad. The shape of the house in this tutorial is made very simple, because the aim is focusing on the use of LibreCAD's functions. Before to "study" this tutorial I suggest to "play" a little with LibreCad, so that you will find easier to follow the instructions here. I hope you will find this tutorial fun and helpful.

With friendship
Claudio

Getting started: defining PAPER, UNITS, DIMENSIONS STYLE

Well, before we start to draw lines hatches ecc, we first have to set up paper size, layers, dimensions' style etcetera.

PAPER

So, let's define paper size: go to Edit – Current drawing preferences – Paper, here you will probably find "A4" on the list the paper list, and "portrtrait" as orientation (this means vertical orientation), then switch the "A4" to "A3" and select "landscape" instead of "portrait".

UNITS

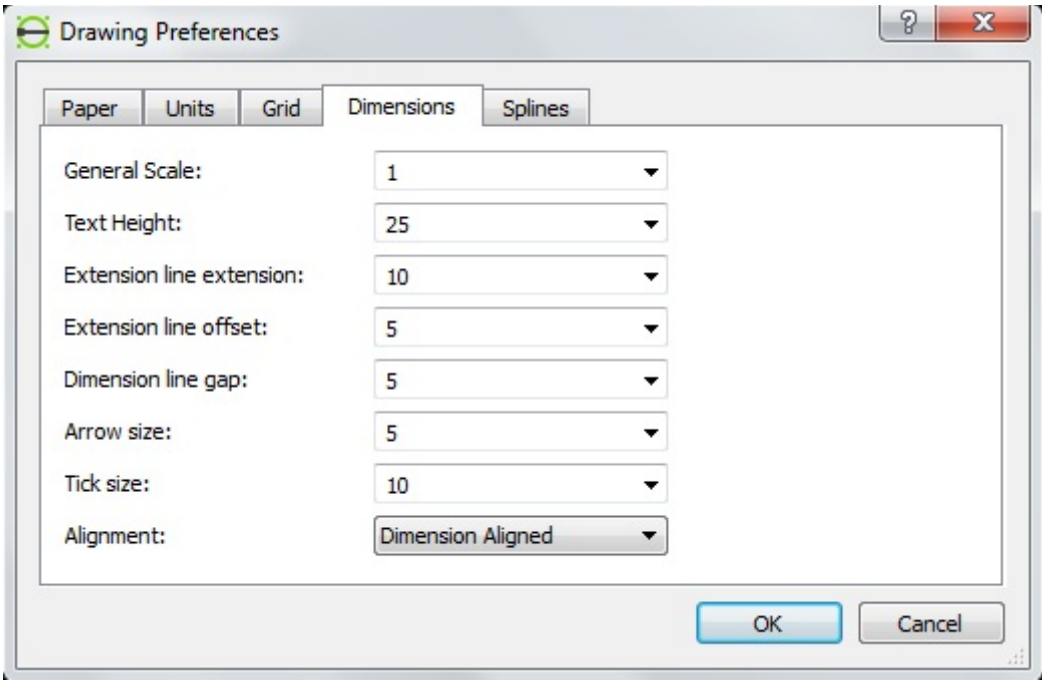
Remaining on Current drawing preferences, on column Unit"select **NONE** as main drawing units. Then on "length"zone select decimal, and 0.0000, and for the angle dimension select deg/min/sec.

GRID

I usually do not use grid, anyway the default grid can be useful for many person, just click on "show grid" if you want to visualize it.

DIMENSIONS

Ok, here you can set at your choice, but I'll show you my choice, and I suggest if you are not used to LibreCad yet to use my settings; anyway, down here there are my settings:



SPLINES

We will not set SPLINES because we will not use them!

Defining LAYERS

Once we have set paper, units and dimensions' style, let's define layers. If you do not visualize the layer list, simply go on the horizontal bar and click random with right button mouse and click with left mouse button on "layer list". So you should visualize it.
Now that we have the layer list click on the icon represented by a + symbol, and add a layer; call the layer "dimensions", then select colour "Magenta", width 0,18 and line type "Continuous".
Down here there is a little prospect of layer proprieties usage.

	ADD A LAYER
	REMOVE A LAYER
	SHOW THE LAYER PROPRIETIES
	SHOW ALL THE ENTITIES OF ALL LAYERS
	HIDE ALL THE ENTITIES OF ALL LAYERS

*The eye icons near a single layer show/hide all the entities of the relative layer.

Here we have all the layer to add and their attributes

LAYER LIST		
LAYER	**COLOUR**	**WIDTH**
dimensions	Magenta	0,18
door_windows	Cyan	0,18
ground_line	Dark red	0,50
hatches	Black/White	0,13
other	Black/White	default
raster	Black/White	default
section_lines	Black/White	0,50
sections	Green	0,35
shadows	Light grey	default
texts	Blue	0,18
views	Dark yellow	0,18

- All line types are continuous, we will change line types just for few lines.

- I did not assign colour nor width to layers "other" and "raster" because other is for all the entities that are not classified in the other layers that we have, and raster is because images do not have width; so we will assign to "other" entities customized colour, width and line type, leaving "raster" like we have already set by tab above.

- I did not assign the colours "red" and "yellow" to any layer because in my Country (Italy) those colours are used for specific purposes, so if you have a similar situation in your Country, choose a different layer colour for the layer/layers you need to change.

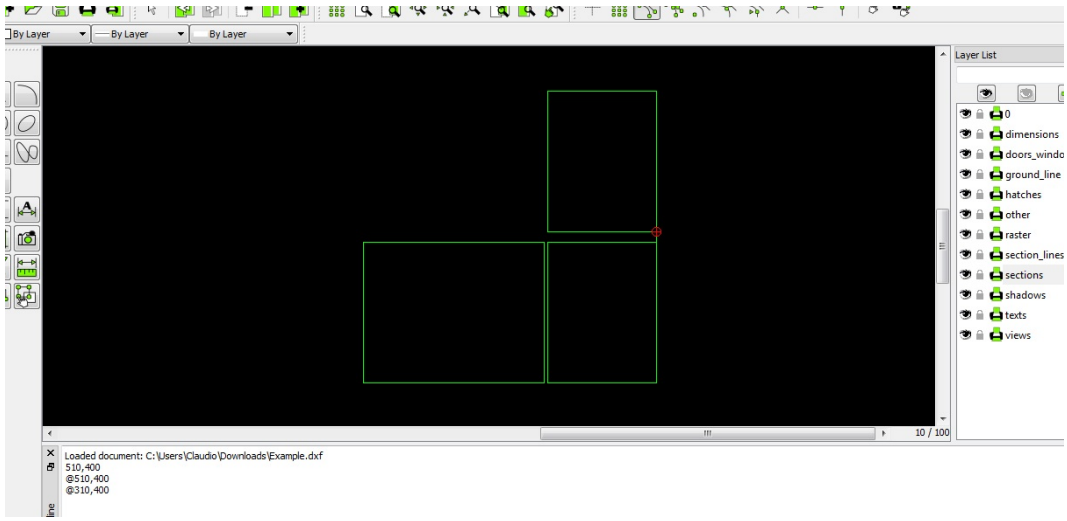
Finally we can draw!

First of all, remember what is written bold down here:
Even if we do not use units, we are drawing "in centimetres", so 1unit = 1centimetre.
OK. We can really start now. Let's define the paper borders.
Well, an A3 paper is 42,0 x 29,7 centimetres, so we should have to have an area of 41,0 x 28,7 units (0,5 of border). We are going to draw in scale 1:1 , this choice is due to simplify the dimensioning, so the rectangle border will be 4100 x 2870 units and when we have to print, we just have to give a scale 1:10 on the dialogue in the print preview. operation. Be sure to be on "other" layer, then click ok "line" tool and then "rectangles". Click randomly at any point on area, then type on Command Line "@ 4100,2870" and the paper borders will be set!!! (Then anything we will draw will be obviously inserted inside this rectangle)

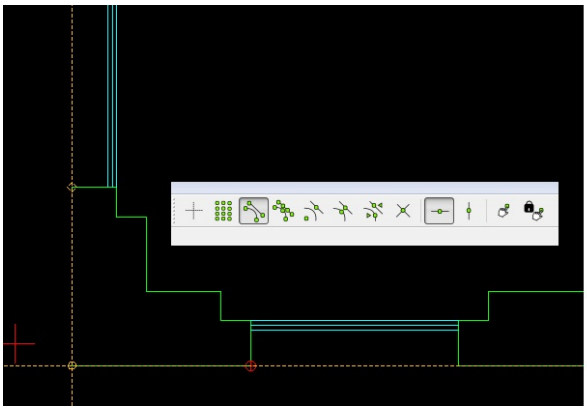
P.S. when I project something I draw the map, the sections and the views outside the paper border, then I move them when they are finished, but if you have a better sense of dimensions you can operate as you prefer and draw directly inside the borders.

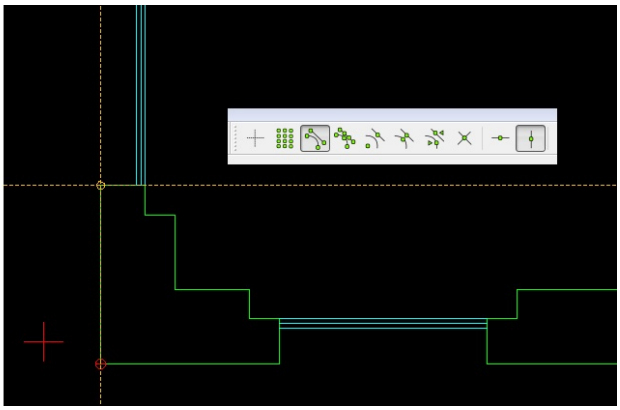
The house map

Now, considering what I wrote on the Post Scriptum (P.S.) up here, switch layer to "sections", then click ok "line" tool and then "rectangles", then type on Command Line "@ 510,400" (@ means the relative zero is the first point you clicked, then 510 is X coordinate and 400 is Y coordinate from the relative zero) and you will have drawn the living room!!!
Now that we know how to draw rectangles, we can define the kitchen, so click on "line" then horizontal lines, and define 10 as length and put the line at the bottom on the right corner down of the living room rectangle. Then "line-rectangles" and on Command Line "@ 310,400". Now you can remove the 10 units horizontal line and create a vertical line of 30. on the top right corner of the kitchen rectangle. Ok, the next tip is create the double bedroom, that has the same dimensions of the kitchen, so go to modify and copy the kitchen rectangle selecting the right down corner as first point and the higher point of the 30 units line. Now, you should be in a situation like this down here:

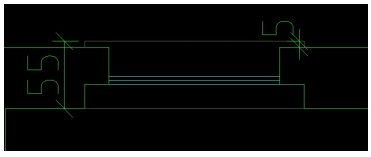


Well, now, look at the dimensions on the Appendix 2 and try to create the other rectangles.
Now that you have all the internal walls, we have to create the windows shapes. To do this we have to start from the middle point of each room except the living room and the box. Let's start from the kitchen, add 3 lines from the middle point of the right border (horizontal of 20 units, vertical of 20 units and horizontal of 30 units), move them down of 90 units. Then click on "modify-mirror" and select those 3 lines set as first point of the mirror the middle point of the right border and as second the middle point of the left border of the kitchen, et voilà!!! We will have the window shape! Now we have to move it and to do the others. The steps for the horizontal windows are similar, so add lines (vertical of 20 units, horizontal of 20 units and vertical of 30 units) or copy and rotate the one you have created. Try the method that more suits to you! Down here there are the distances to the borders. Don't look yet the doors in the internal walls, they will be done further. Now we have to create external walls lines, so add the necessaries horizontal and vertical lines. Little trick, select the snap endpoint of the windows shapes and add horizontal/vertical lines that go from the shapes to a random point of the draw area, now select the snap intersetcion (be sure that this is the only snap active) and click one of the created lines. Then click on the endpoint that is placed nowhere and keeping the left mouse clicked drag this endpoint t the intersection to the other external line, so you will not need to know the coordinates to extend a line to another adjacent. Look down here:

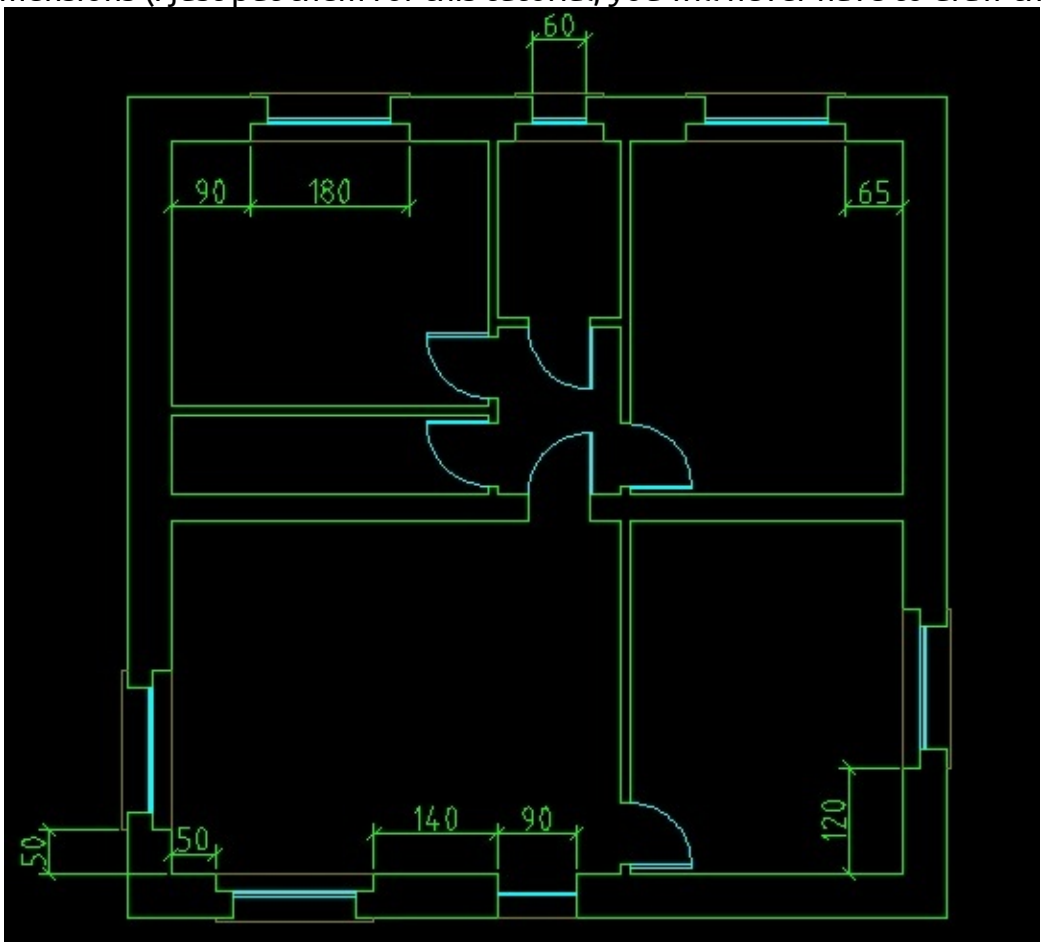




Now switch to the layer "door_windows" and draw lines from the internal corner of the windows shapes, then copy them twice with a distance of 3 units.
Ok, it's time to define doors: doors are 70x 210 centimetres, so first we have to cut the internal walls! To do so, add a line from the down corner of the living room to kitchen one and copy it at @ 0,7; then move it at @0,10. Now do the same operation with the other doors (Consider that for horizontal door you must copy at @70,0). Now create a horizontal line of 70 units from the corner door, then copy it at @0,-3 join the two horizontal lines with another line, now we have a door!!! Ok, now create an arc of 70 units of range, that has centre on a corner of the door and radius 70 look at the kitchen door in the picture above to check your result! Now try to play with the commands "copy" and "rotate" in order to go a little faster.
 It's time to draw windows' sills: so switch to layer “views” and draw lines from the internal side of the windows, then copy them to the external side at distance 55, finally from the end point of the external lines create two lines to the internal side of length 5.



When you will have finished your result should be like the picture down here, except the green dimensions (I just put them for this tutorial, you will never have to draw them).

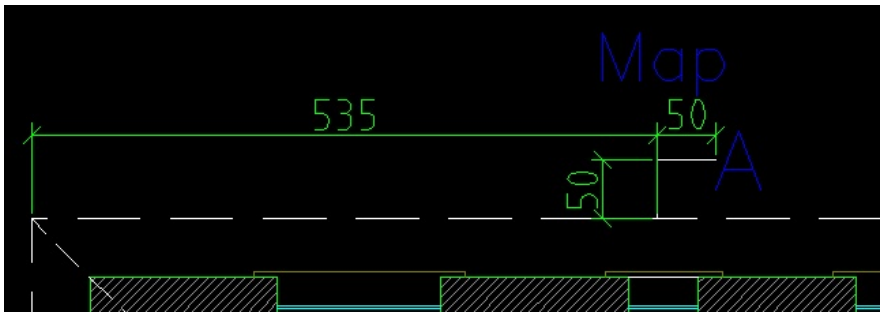


Next step is to draw the roof direction, so: switch to “other” layer and add lines that have distance 50 from the external walls' lines then join the corners of the square. Now select those line created in other layer and change line type in “dash”, “dot” anything different from “continuous”. And the roof is done, just remember that this square exclude the drainpipes space.
To complete the map, the last thing that remains to do is hatching.
So... keep active layers “sections” and “hatches”, be sure to operate in layer hatches, then select all the (sections) lines and then click the relative icon “hatches”, give confirm and choose a hatch. I've chosen ***ansi31, scale 4***.
Now remain in the hatches layer, and create again rectangles upon all the existing rooms and a polyline for the living room access room, then select the rectangles and add the hatches, this is my choice in the example, notice that kitchen and toilet have two hatches:

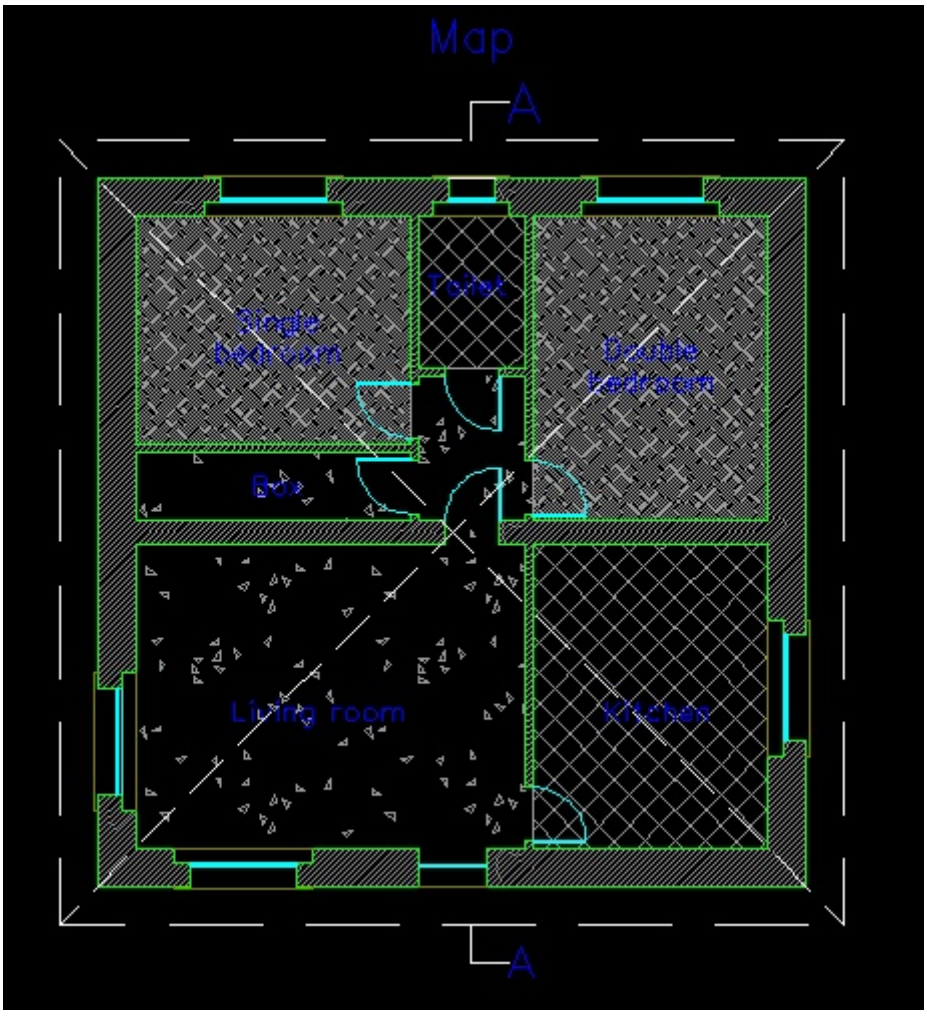
ROOMS	***HATCH***	***SCALE***	***ANGLE***
BEDROOMS	ar-parq1	0,5	45
KITCHEN and TOILET 1 KITCHEN and TOILET 2	kerpele kerpele	2 2	0 90
LIVING ROOM, BOX AND ACCESS ROOM	ar-conc	3	0

And now you can delete the hatches border!

Well, now it's time to draw the section line, so switch to layer “section_lines” and draw a vertical line 540 units far from the left border of the roof. You can keep the line crossing the draw or you can separate it as I did, and keep just its end and the beginning in order to have a clearer draw (dimensions in the picture are for you).

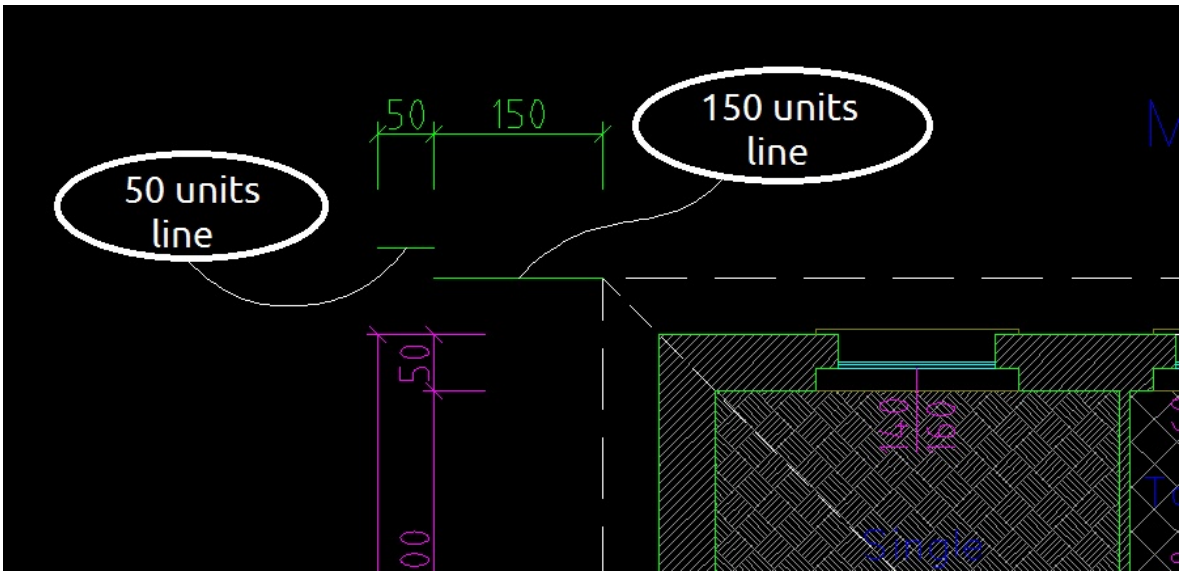


At last you can switch to layer “texts” and using the icon “insert multi-line text” insert the name of each room, insert the section letters (“A – A”, alignment middle left) and the view name (“Map”, alignment bottom centre). Look here for erase any doubt!!!

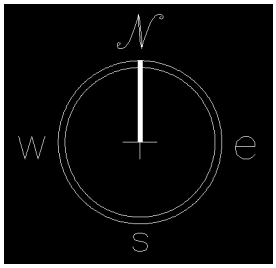


Finally we have to give dimensions to our project. You can insert dimensions directly into the drawing, but I prefer to put them outside the drawing, so that the entire project can result clearer and readable. So... now we have to set the space, because we don't want to put dimensions outside randomly, it would be awful! So, let's define a distance between the draw and the first dimension line: let's say 150 units, and let's define a distance between two dimension lines of 50 units. Well, to do this I find it is a simple way

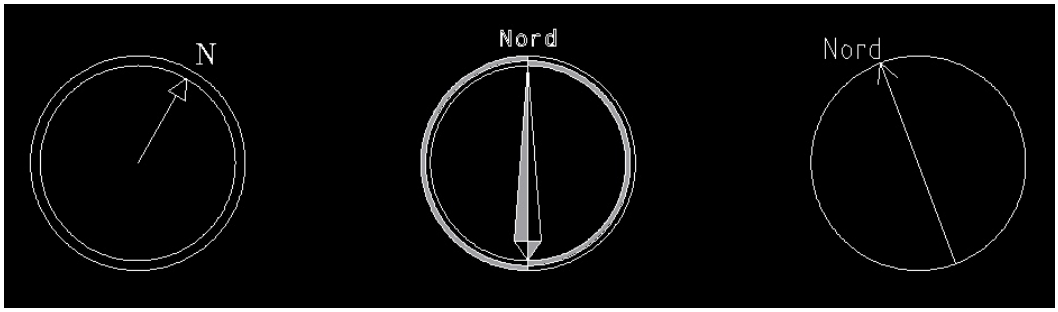
to draw lines from 150 units and 50 units from the drawing, so thank to to the snap endpoint we can put the dimensions in a right place without any trouble, this method can be obviously used for horizontal and vertical dimensioning: look down to get an idea!



Each map must have a north and a south, so let's draw the compass!!! You can draw a circle and add a simple arrow and indicate the North, this should be enough, but if you want to create a compass like mine here:
- switch to “other” layer;
- create a rectangle (@3.2, 60) and fill it with the hatch “solid”;
- create two circles from the middle point down with radius 55 and then 60 units;
- create a cross that has lines of 25 units, then move this cross from the intersection of its axes to the centre of the circles;
- add the letters N(font “scriptc” – bottom centre alignment), s(font “simplex” – top centre alignment), e(font “simplex” – middle left alignment), w(font “simplex” – middle right alignment) and adjust them if they are too close to the circles. Et voilà, that's all!!!



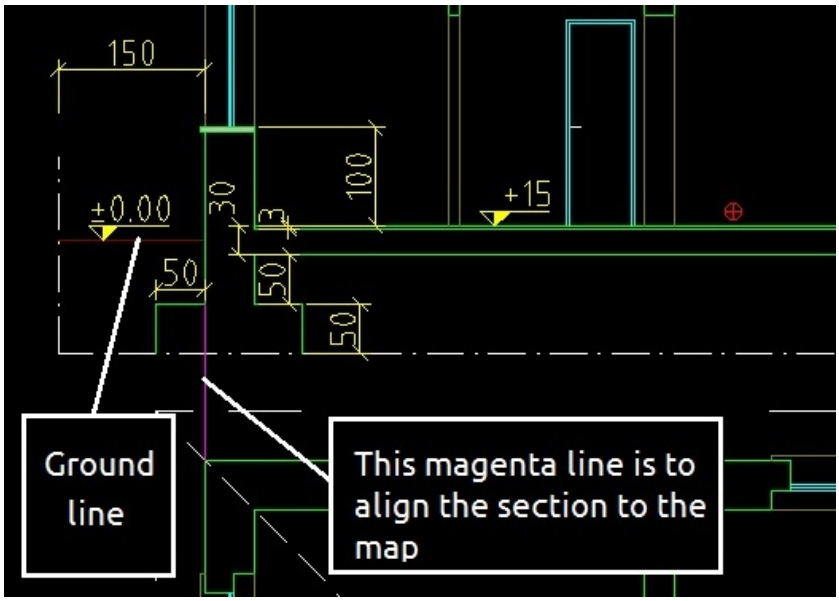
Anyway you can try to create your own compass, down here some examples



And that's all for the map!!!!!

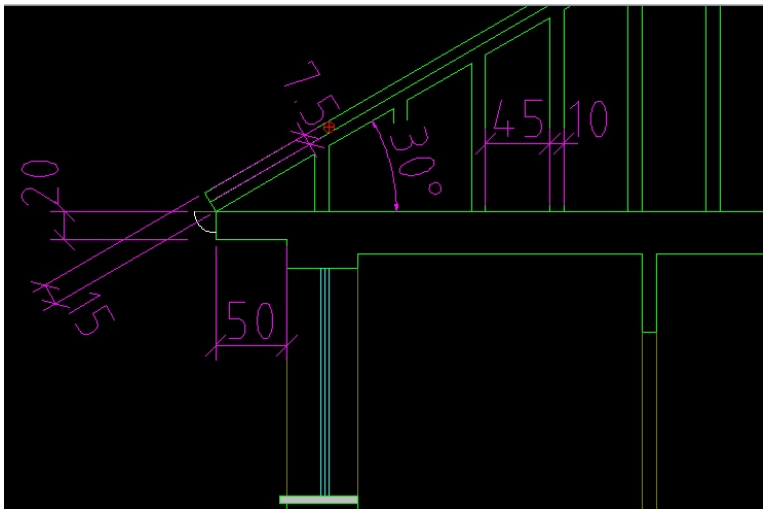
The section

Ok guys, we've set the map, it has not been so difficult, right? Next we have to do the section. As we know by orthogonal projections, we have to draw what we see if we cut the house with the A-A section line.
So... My personal method is to copy the map (hatches and dimensions are not necessary to be copied), rotate it and then create the section.
Remember:
- the ground floors thickness is about 30 centimetres, so 30 units, the other one is 2;
- the floor is 15 centimetres higher than the ground, so 15 units higher than the ground line;
- keep the lines on the relative;
- to do as I did here the dimensions look down the picture

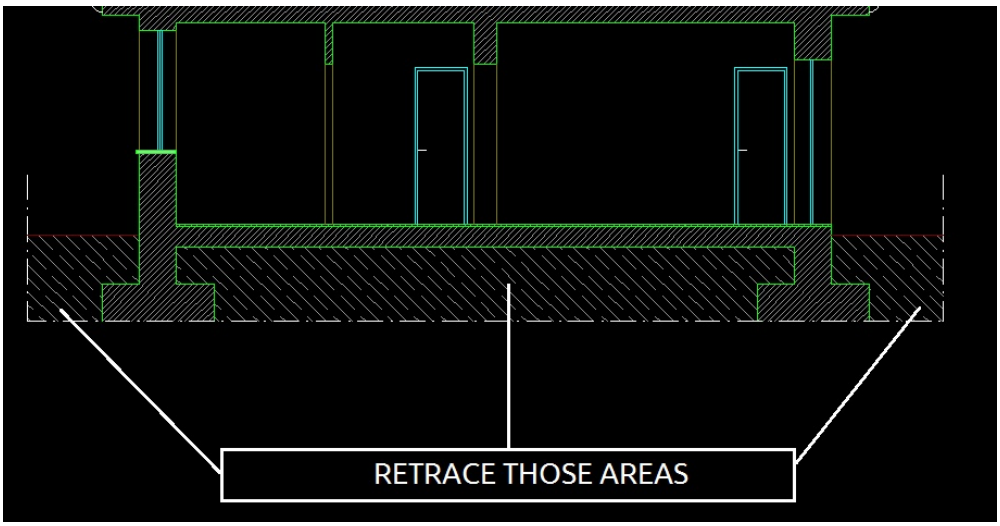


Moreover
- sills are simple rectangles (@55,5) with solid hatch inside;
- every line that is not cut or in layer “door_windows”, then is in views;
- down here a little help for the doors (remember that all doors have same dimensions, so once you have drawn a door, to draw another one it's enough to copy it!!! ☺).

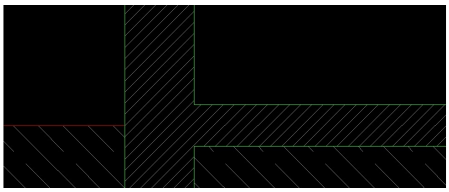
Then we have to draw the roof! Well, take the measure from the image down here

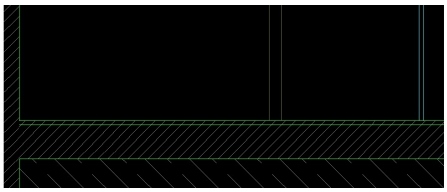


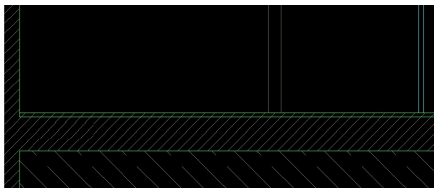
and do it until the half of the section, now we will use the mirror command, because we don't like boring tasks!!!
To mirror objects:
- select the objects that have to be mirrored;
- click the icon “modify-mirror”;
- select the two axepoints;
- voilà! Les jeux son faits!
Now let's add some hatch to this section: select the cut parts and add the hatch “ansi31” with scale 4, angle 0.
The last hatch to add at the section is “concrete” with a scale of 9 and angle 90. Similarly to the hatches we have created for the floors, we have to retrace the area of the ground and add the hatch, so we can delete the retracing lines! (look at the picture)



And finally..... We have not finished yet (A)! In fact we have to copy the line of the floor of 3 units down (B) and we have to extend the walls lines to the second line we have just copied (C), here look down, so if I am a disaster as teacher you can understand


A

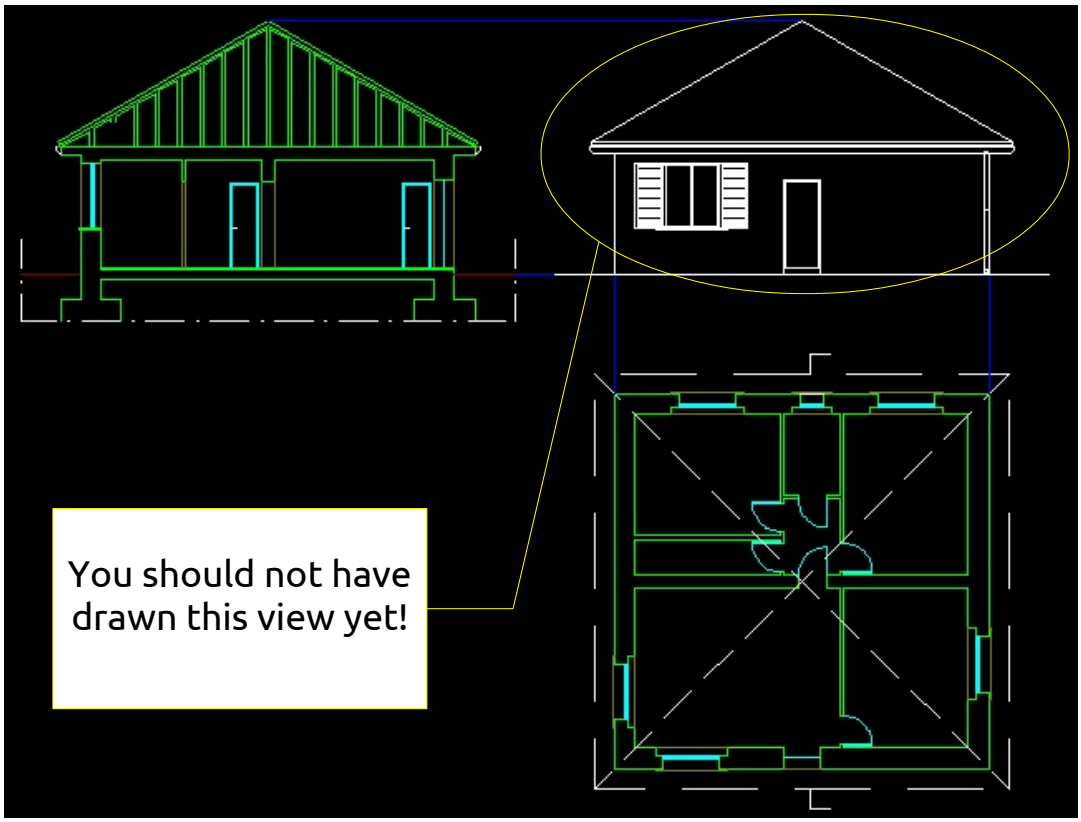

B


C

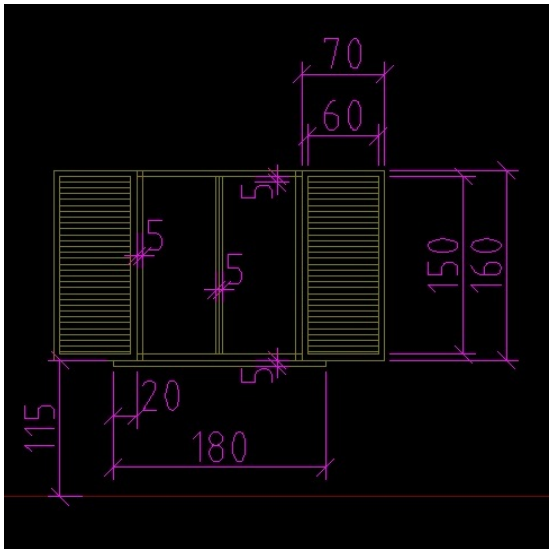
Now we can insert dimensions: in order to give dimensions to the section, you can take the measures from the EVERLASTING Appendix2!

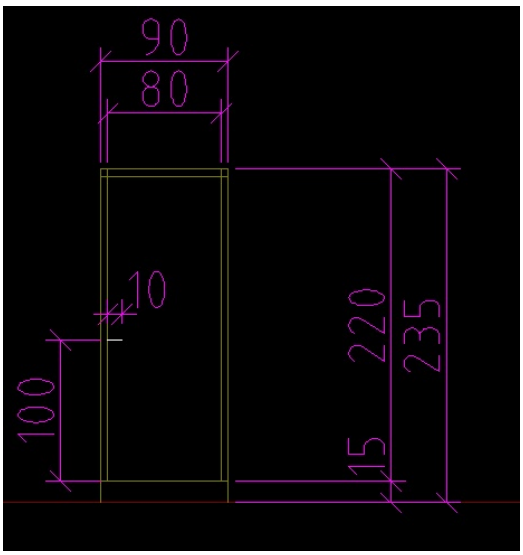
The views

And finally we're almost done! Views are quite simple to do, because I've put all windows with the same dimensions, except for the toilet window that is a bit smaller. Well, in order to be sure to create a good view, my method is to copy map and section, and to put them as in figure, so that when we take the reference points from the map and from the section, we'll be sure that the result will be flawless (look at the blue lines); look down, the final result! Down here you can see the view in white, because so far you should not have drawn it yet! Remember that I left drainpipes out the roof shape in the map!!!



Now, down here you have the dimensions of door and windows... So, you have just to copy those pictures . Naturally once that you create a window, you can copy it many times!!!



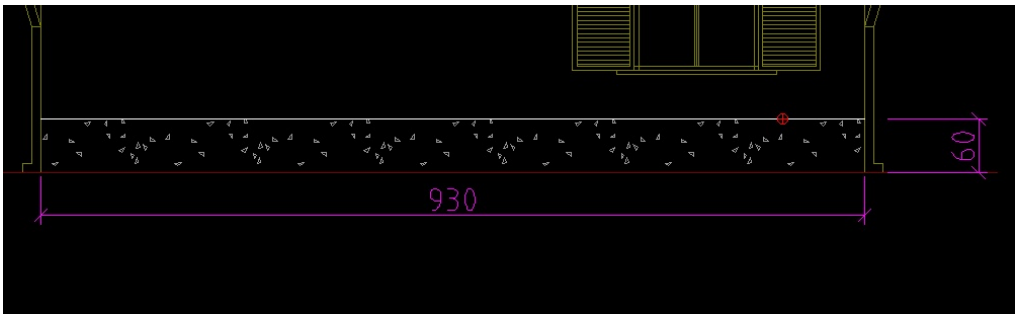


The shutters internal lines have a distance of about 5 units, you can use the hatch “iso03w100” (scale 0.3, angle 0) or “iso03w100a” (scale 0.15, angle 0) and then click the command “modify-explode” to explode it.
The roof can be set adding the hatch “ar-rshke”, scale 1 and angle0, but this time you have to remember to be operating on the “views” layer!
Now the only operation is to give the name to the views through the command “insert multi-line text” and choose the alignment, height and font, so our little project will be complete! (I've chosen “simplex”, height 40 and bottom-centre alignment)
Well, that's all for the tutorial...
But if you want to have some special feature just keep reading!!!

Textures, shadows and other features

At last we can give more artistic and/or realistic effects:

Textures:
In order to create textures you simply have to create an area and assign a hatch with a proper scale..
So, to do this create as many polylines or rectangles as you need and fill them with the hatch that more suits you, then delete the polylines/rectangles.
In my case, I created some kind of texture from the ground to 60 centimetres high using the hatch “ar-conc”, scale 1.4 and angle 0, to give a more realistic effect on the wall.
Look down, and if you prefer some other texture, use your fantasy!!!



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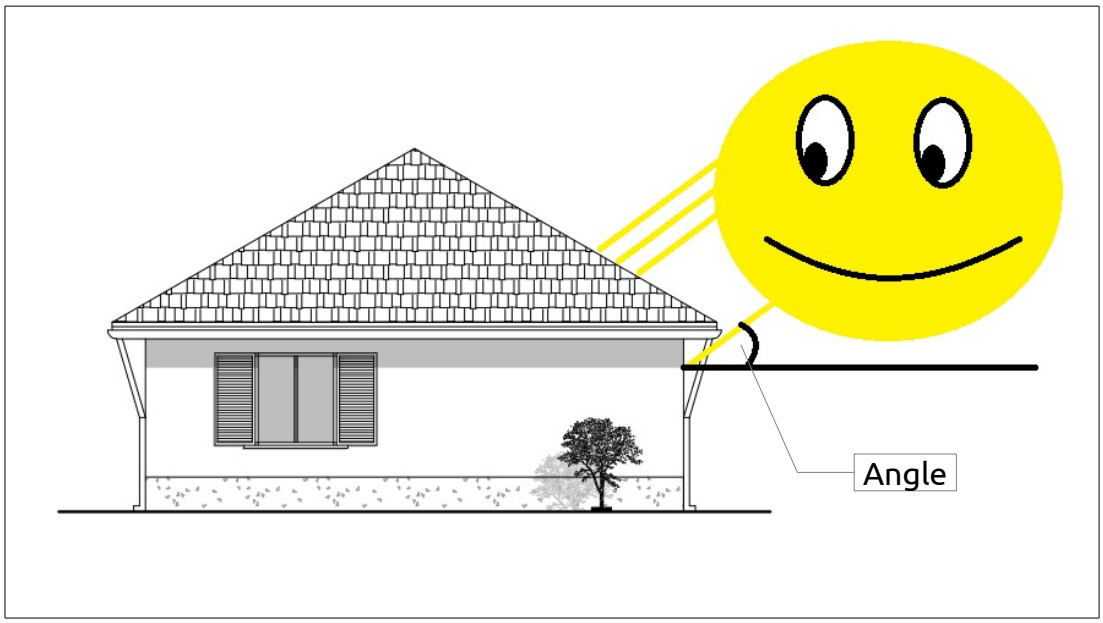
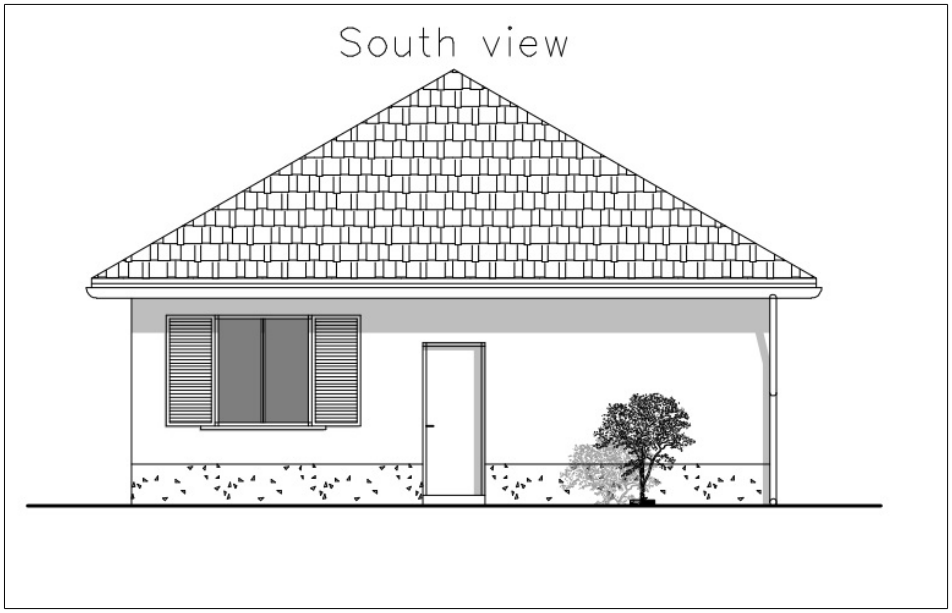
Shadows:
Shadows in my opinion are a bit boring, but they are also essentials to give a more realistic idea of the 3rd dimension.
Let's add them!!!
First, there is a kind of geometrical method to add shadows to the views, but we'll skip it and we will use just our intuition.
When we add a shadow we must consider the Sun rays as parallel, so we can consider them as a unique big ray with an angle: the angle number is not important, just draw a line and consider that line as the ray.
Now when this line encounters an object, the area of the object is projected on the object behind and the shape will be deformed. So it is not important how much is deformed the projected shape, but is important that every shape has the same deforming factor!
In my case I gave around 50 centimetres of shadows from the roof.
About windows remember that inside a house is darker than outside, so the shadows of the windows will be darker!
To give you an idea about what I am saying, just look at the picture on the next page ☺

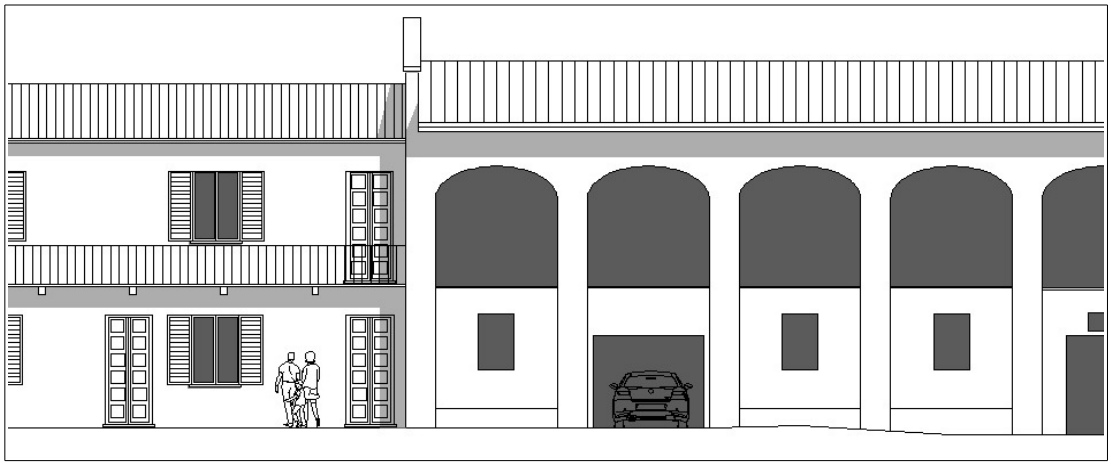
Down here is shown rays' direction, it's quite simple, don't you think?



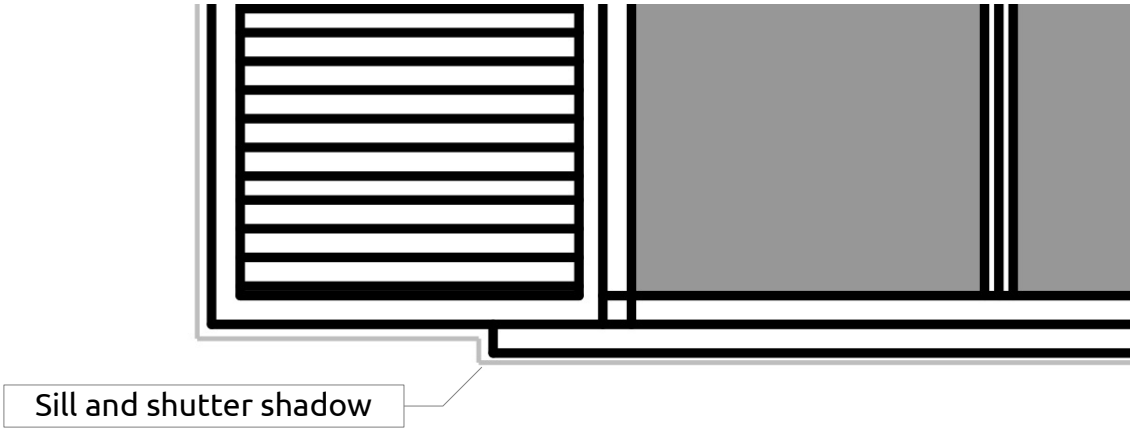
The picture down here instead, show you the different shadows' darkness



Here another example, taken from another work of mine



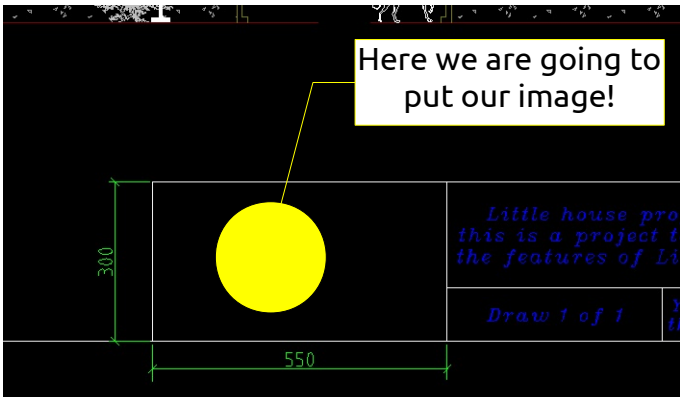
And don't forget to give shadows to sills and shutters!!



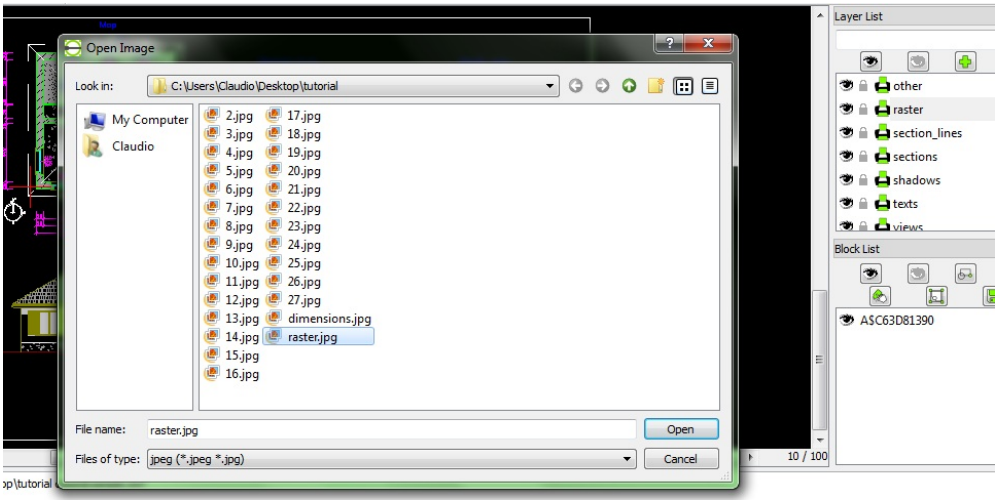
Special features:
So, if you want to add some person, or some animal, you can search the world wide web to find some interesting drawing, then insert it as a block and change its layer (as I did); as you can see I added a dog, two little trees and a man.
Moreover, a really cool opportunity I found in LibreCad, is the possibility to create my own hatches in a simple ways and add them to the relative folder (no absurd .pat formats, just draw, save as dxf and add the hatch you created to the folder). Try if you don't believe!

Raster images

Naturally In a real work you might need to insert images, so, you just remember that we are using no units, so a pixel can be considered a unit in our project!
Now, just check the image dimensions before insert it and then insert it. Once you inserted it, use the command “scale” if necessary.
Here an example for our little house: the image raster.jpg is 550 x 300 pixels, then we can assume that is 550 x 300 units. Very well! Now let's switch to layer “other” and let's create a box anywhere we want; I've chosen a place near the little tab down on the right (look at the first picture of this chapter). Now, first we have to switch to layer “raster”. Now click the icon “insert image” and then we have to select the image “raster.jpg” from a folder (I give the image file to you, but this really depends where you store the image, so browse your hard disk to find it! Look at the second picture of this chapter). As you notice, when we insert an image using LibreCad, the reference point is the left corner at the bottom, so let's insert it in a proper way and.... we have inserted an image!!!



Down here, the example of a folder in my hard disk where the image “raster.jpg” is stored



Down here the result!!!

Remember: when you insert an image, LibreCad consider the path of that image, **FOR THIS REASON THE DXF FILE HAS NOT THE PICTURE!!!** In fact is important that every time that you use images on your works, you keep the original image files in the same folder where you have a dxf file!!!!!!!!
* If you do not need all this precision, you can insert the image and to set in a suitable way. Simply use the command “modify-scale”

Print

Fine, if you have to print your drawing, you can assign a scale 1:10 to the entire drawing and fit it to the paper through the relative icon on “print preview” mode. I always print in greyscale, in order to have a more realistic drawing. To do this, turn off the layers “hatches”, “shadows” and “raster”, then change colour to all the entities (black/white), now you can re-activate the layers “hatches” and “shadows”!
Well, now I really finished, so, try do do this project by yourselves!

Conclusions

Well my friends, I hope that you found my tutorial useful, at least not too boring. I also hope that you now have a better idea about open source programs. My piece of advice is: you can try, if you don't find this program suitable for you, then you can come back to your old programs, if you find useful this tutorial you can share it, copy it and distribute it (under your responsibility)!
Finally I would like to thank you all and say

See ya!!!

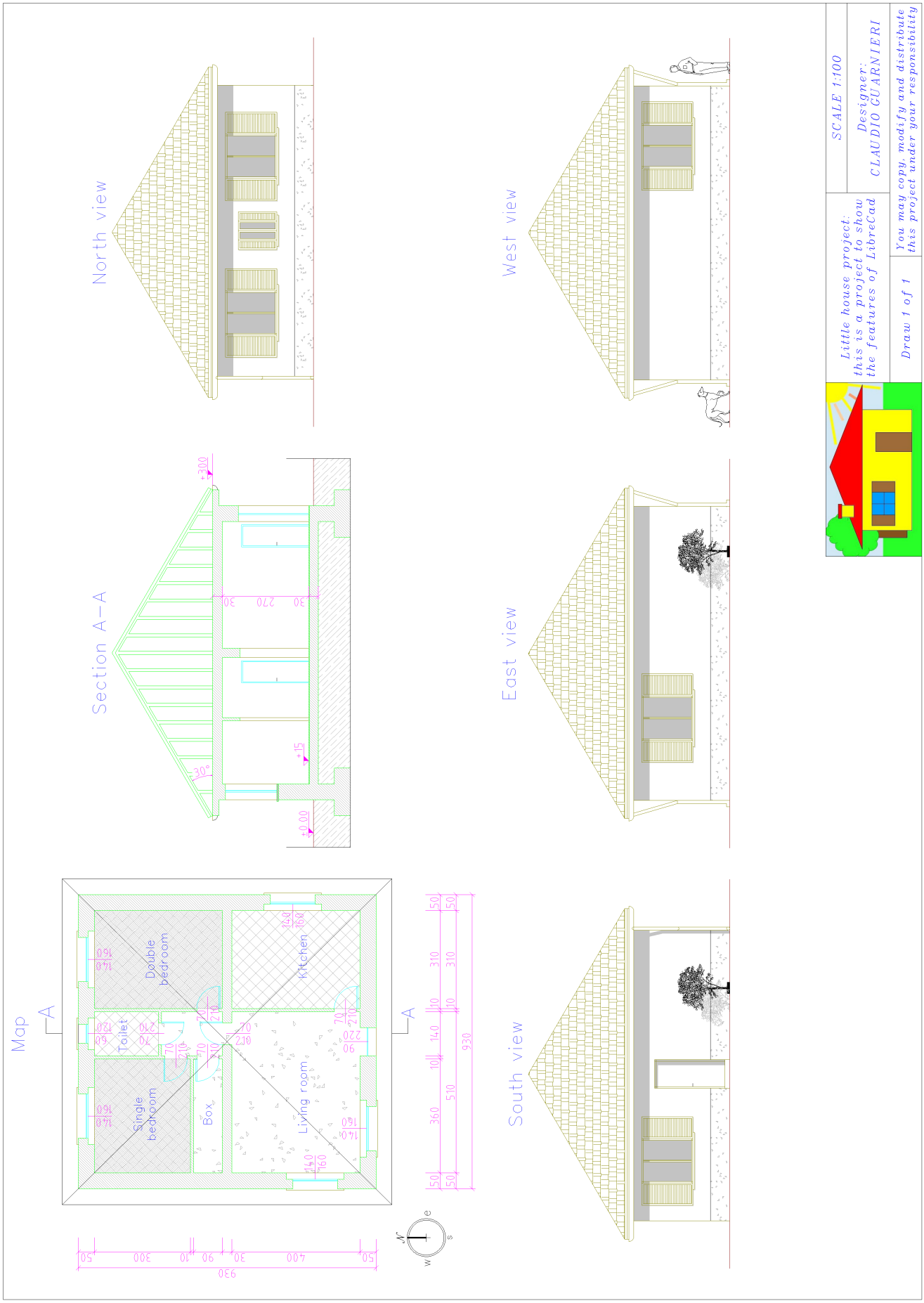
Claudio ;)

Appendix 1: paper dimensions

(those dimensions are taken from Wikipedia and are expressed in millimetres)

A SERIES	
A0	841 × 119
A1	594 × 841
A2	420 × 594
A3	297 × 420
A4	210 × 297
A5	148 × 210
A6	105 × 148
A7	74 × 105
A8	52 × 74
A9	37 × 52
A10	26 × 37
B SERIES	
B0	1000 × 1414
B1	707 × 1000
B2	500 × 707
B3	353 × 500
B4	250 × 353
B5	176 × 250
B6	125 × 176
B7	88 × 125
B8	62 × 88
B9	44 × 62
B10	31 × 44
C SERIES	
C0	917 × 1297
C1	648 × 917
C2	458 × 648
C3	324 × 458
C4	229 × 324
C5	162 × 229
C6	114 × 162
C7/6	81 × 162
C7	81 × 114
C8	57 × 81
C9	40 × 57
C10	28 × 40
DL	110 × 22

Appendix 2a: the drawing (coloured version)



Appendix 2b: the drawing (greyscale version)