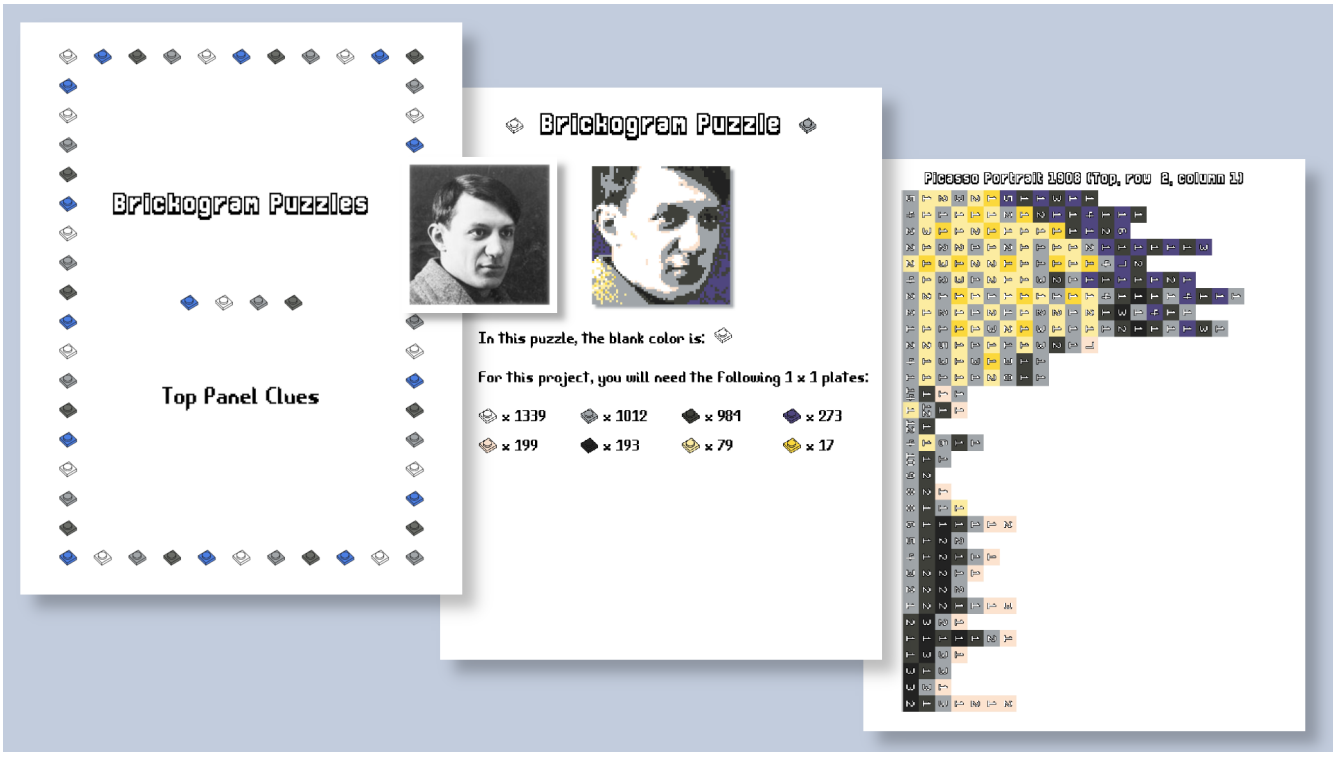
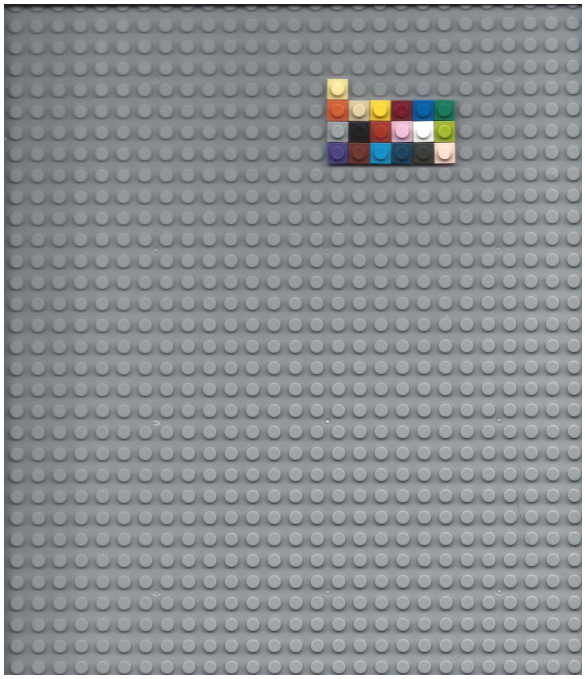
Instructions on How to Use Gimp to Generate Pixelated Images for Brickogram

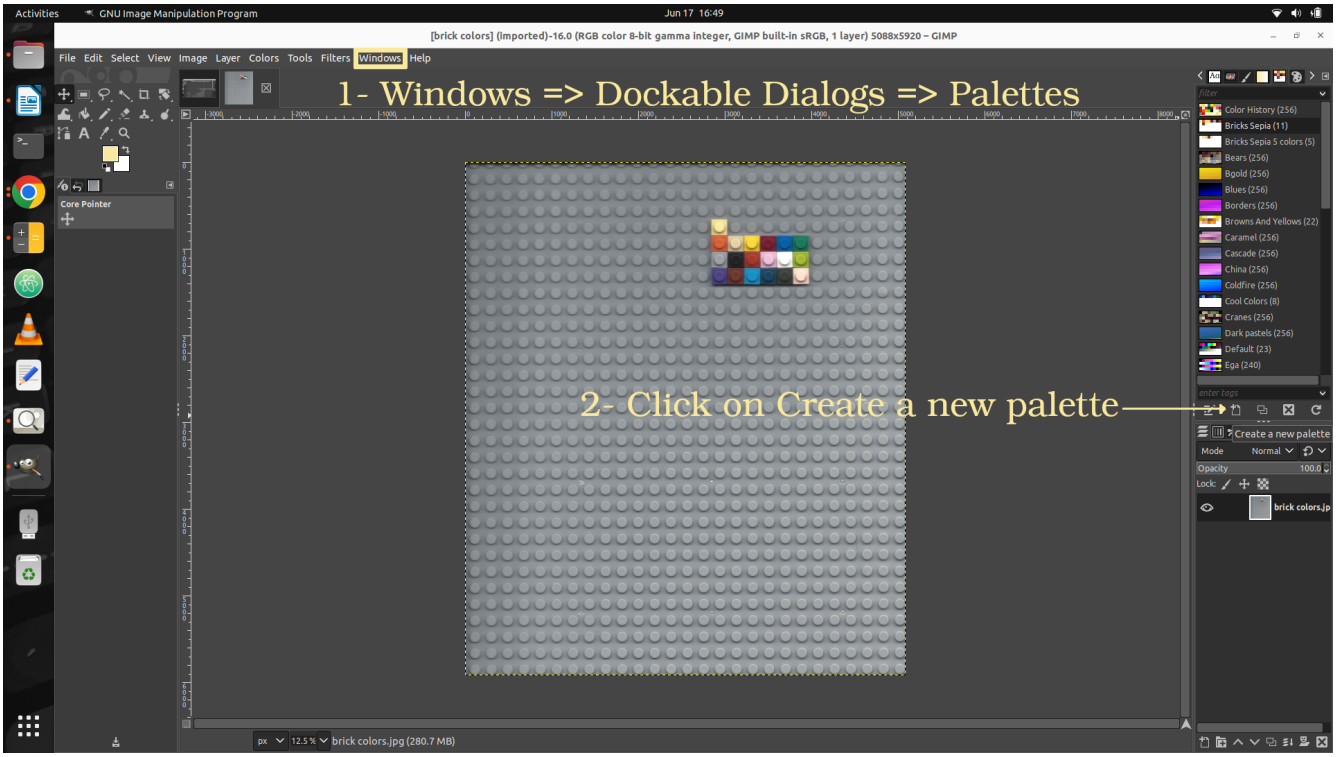


Creating a Custom Color Palette in GIMP, Based on the Colors of Your 1 X 1 Plates:

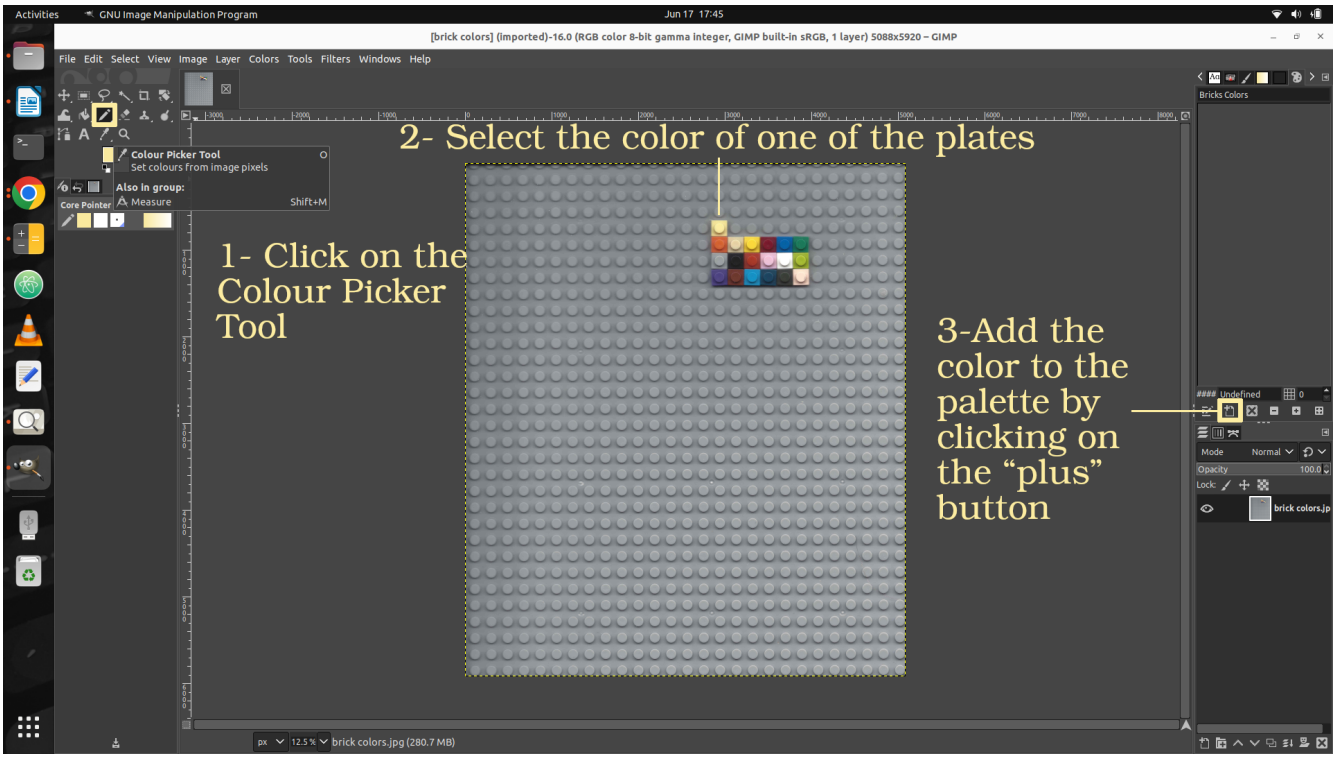
Step 1. Place all of your different colored 1 x 1 plates onto a base plate and scan it. The scanned image will allow you to extract each color to make up the color palette of your brick set.



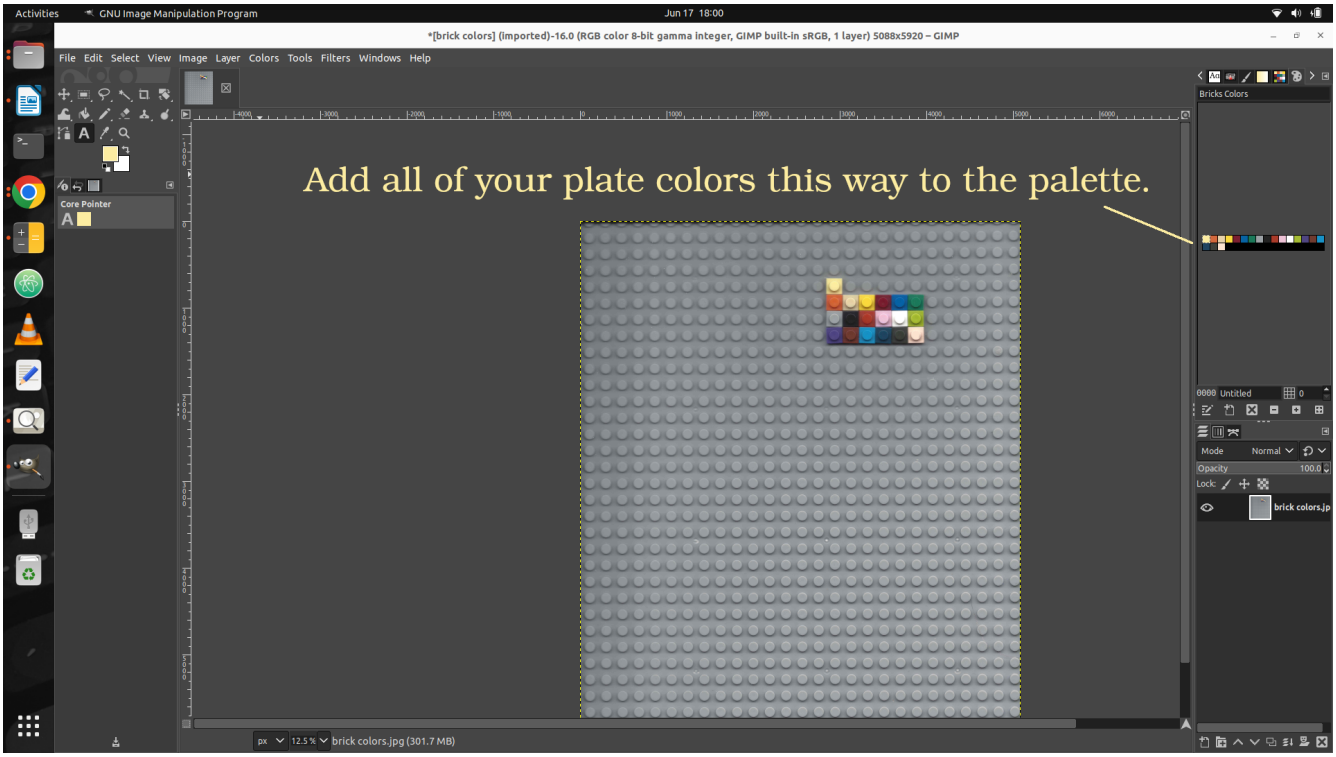
Step 2. Open the image in GNU Image Manipulation Program (GIMP). From the “Windows” menu, select the “Dockable Dialogs” item, and the “Palettes”. Then click on “Create a new palette”.



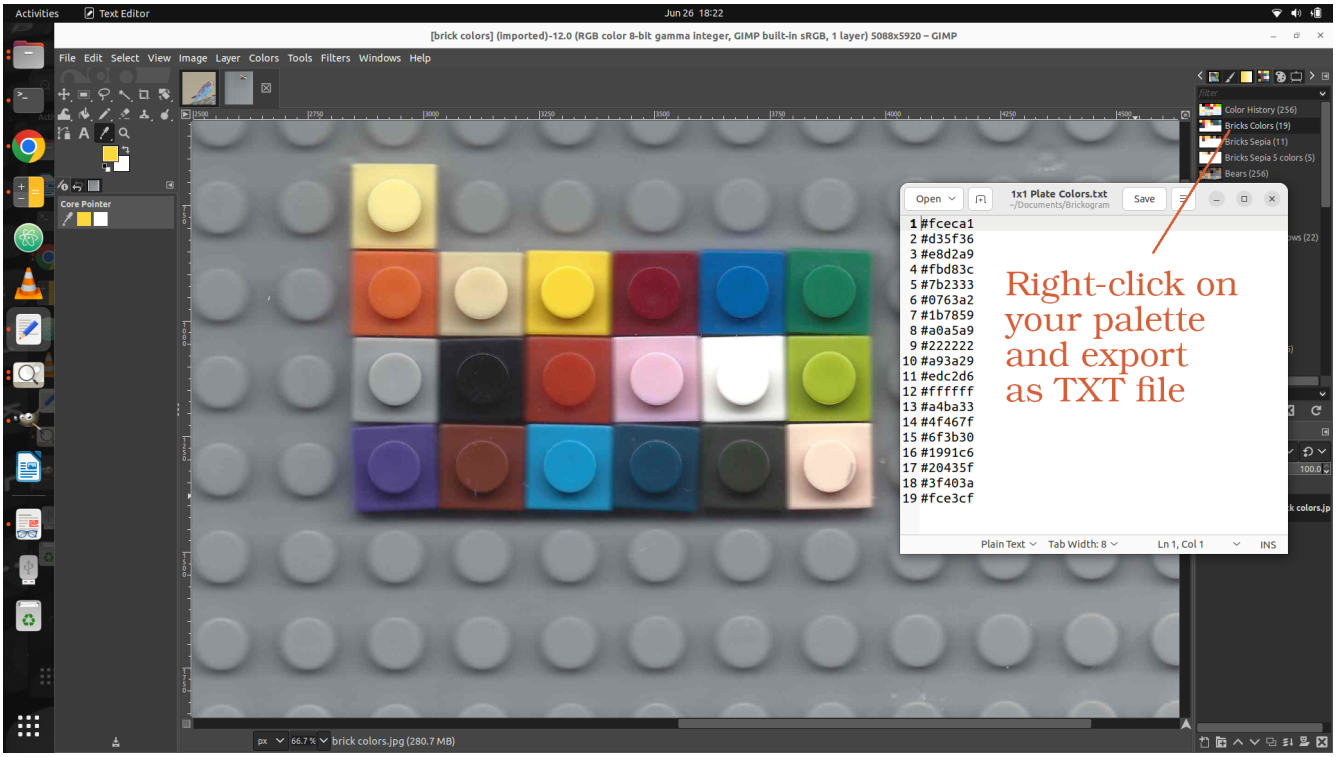
Step 3. Click on the “Colour Picker Tool”, then select the color of your first plate by left clicking on it, and finally add the color to the palette by clicking on the “plus” button.



Step 4. Add all of your plate colors this way to the palette. You could also create another palette with a subset of your 1 x 1 plate colors (some sepia tone colors, for instance), allowing for different renditions of your images. An important point when creating your palettes is that you need to use the same color hex code to designate a given plate color in each of your different palettes. **You should therefore only select the color of a given 1 x 1 plate once using the "Colour Picker Tool"**, and then take note of that hex code (see the next image) for later use in other palettes, or if you mistakenly delete your color palette. This way, all of the colors of the pixelated images that you generate will exactly match those that you initially detected when first creating your palette. Otherwise, the very closely related colors originating from several different "Colour Picker Tool" actions would't necessarily be equated by the code, resulting in frustration for you down the road, as these different colored clues wouldn't be merged together (several closely related shades of yellow, for instance).

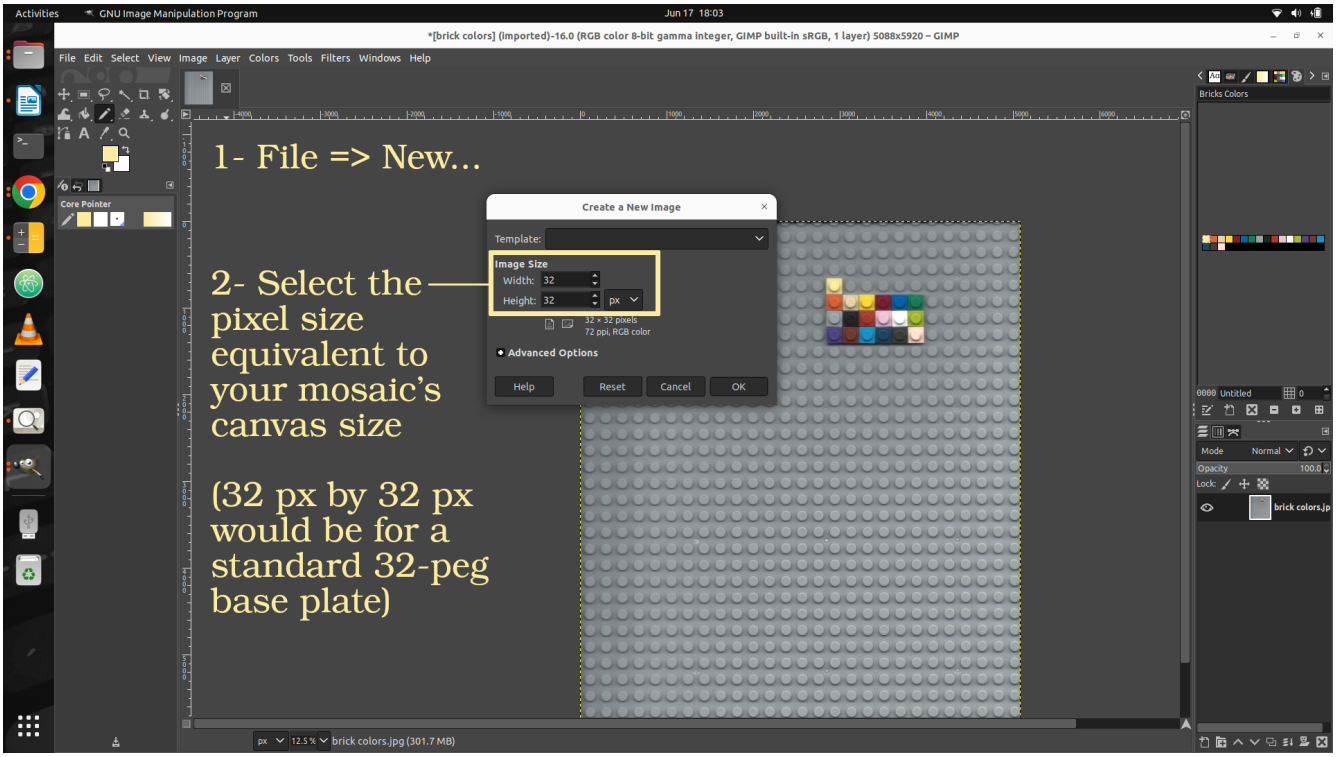


Step 4 (Cont'd). You can simply export the list of all the hex codes making up your custom color palette by right clicking on it and selecting the "export as text file" option.

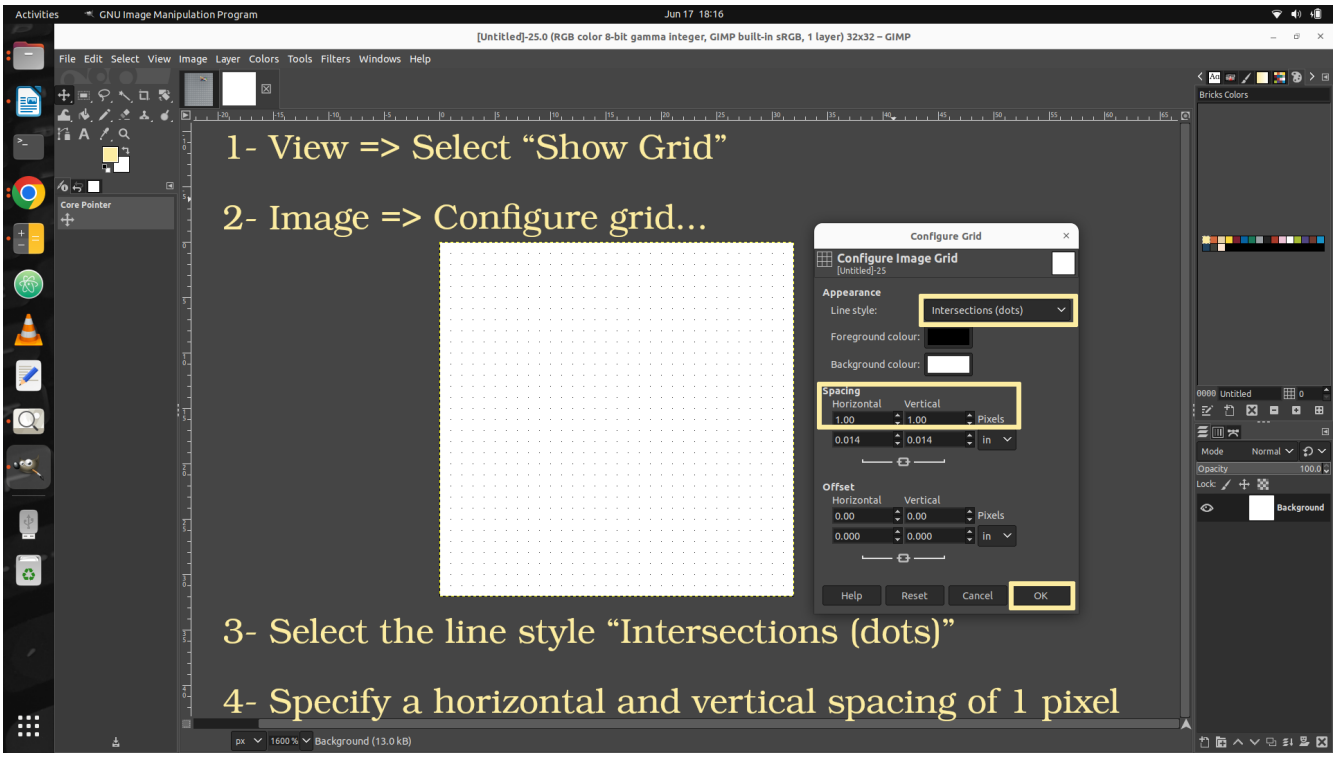


Drawing Pixel Art Using Your Color Palette:

Step 1. Create a new canvas by selecting the “File” menu and chen clicking on “New...”. You will then need to specify the pixel size of the canvas, which is equivalent to the number of pegs per side in your mosaic project. For example, for a canvas consisting of a single base plate, you would enter 32x32 pixels. Another mosaic project having a width of two base plates and a height of four base plates would require a canvas width of 64 px and a height of 128 px.

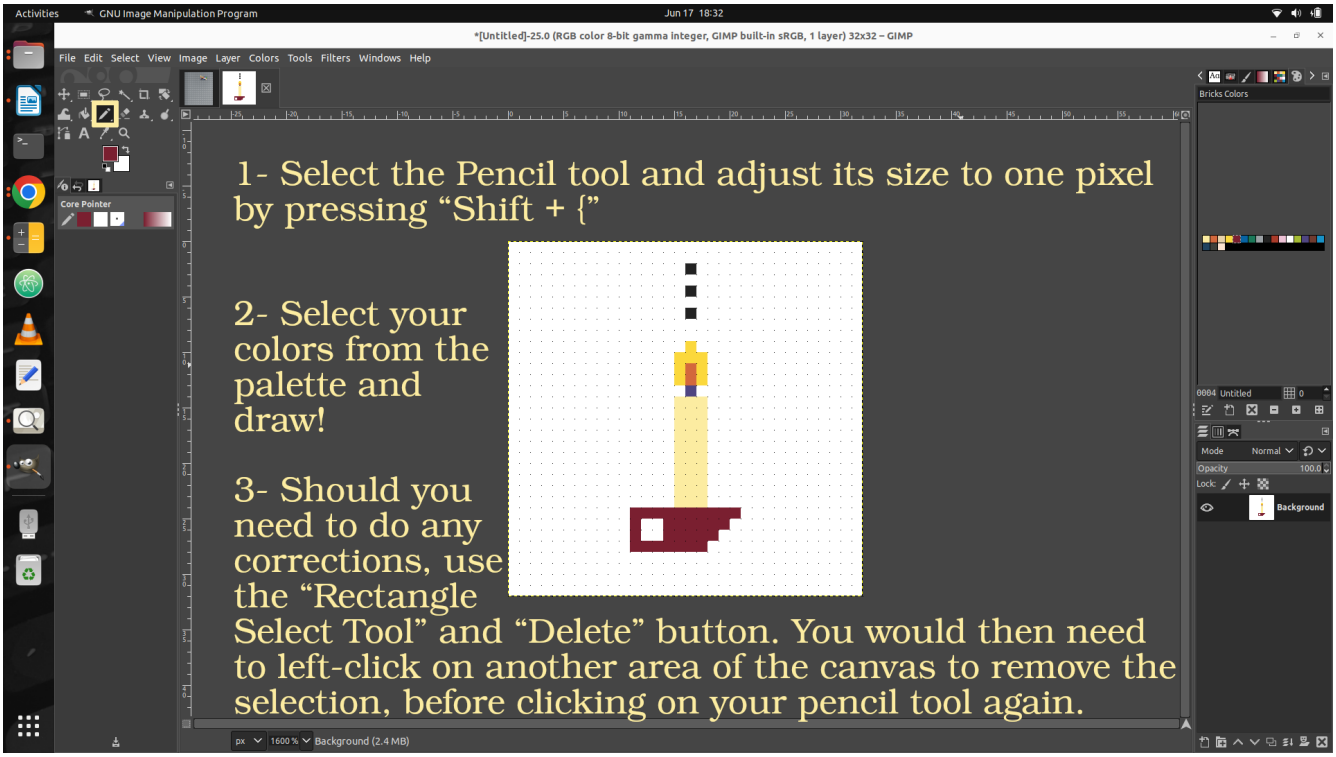


Step 2. In the “View” menu, tick the “Show Grid” option. Then, select the “Configure grid...” option from the “Image” menu. Choose the “Intersections (dots)” line style for better visibility while drawing. Also, you will need to specify a horizontal and vertical spacing of one pixel in order for the grid’s spacing unit to correspond to one pixel.



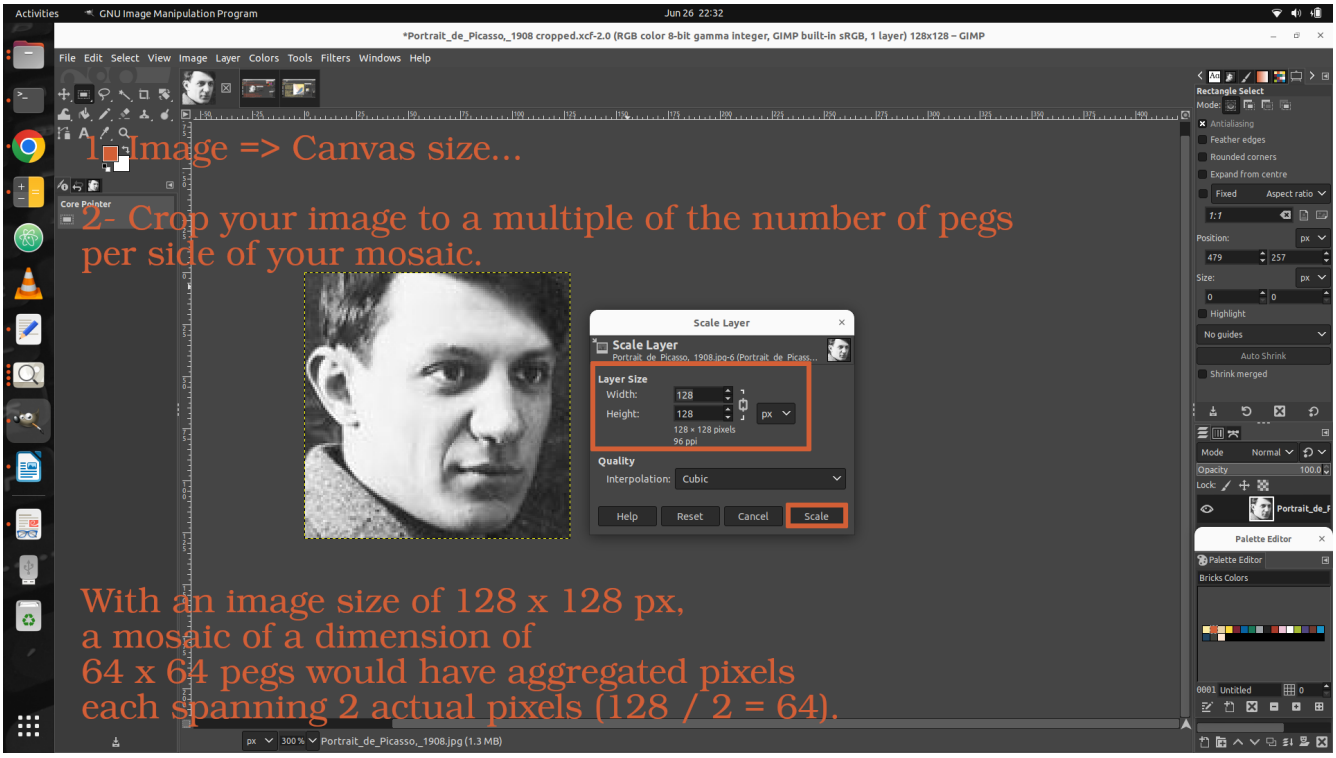
Step 3. In order to draw on your canvas, you will need to select the Pencil tool and adjust its size to one pixel, by pressing Shift and "{". After that, it's as simple as selecting your colors from your palette on the right and left clicking on your canvas to draw pixels! Should you need to make any corrections, you would have to click on the "Rectangle Select Tool" and select the pixels that you wish to delete, then hit the "Delete" button. After you are done deleting, you would need to left-click on another region of the canvas in order to cancel the selection, and then select the Pencil tool once again to continue drawing.

Keep in mind that when generating pixelated images, the number of color transitions from one pixel to the next on any given row or column, excluding the blank pixels, should be at most 23, in order for all of the colored squares to be printed on the nonogram instruction sheets. The code automatically checks for this, and will let you know if there are any issues and where to correct them.

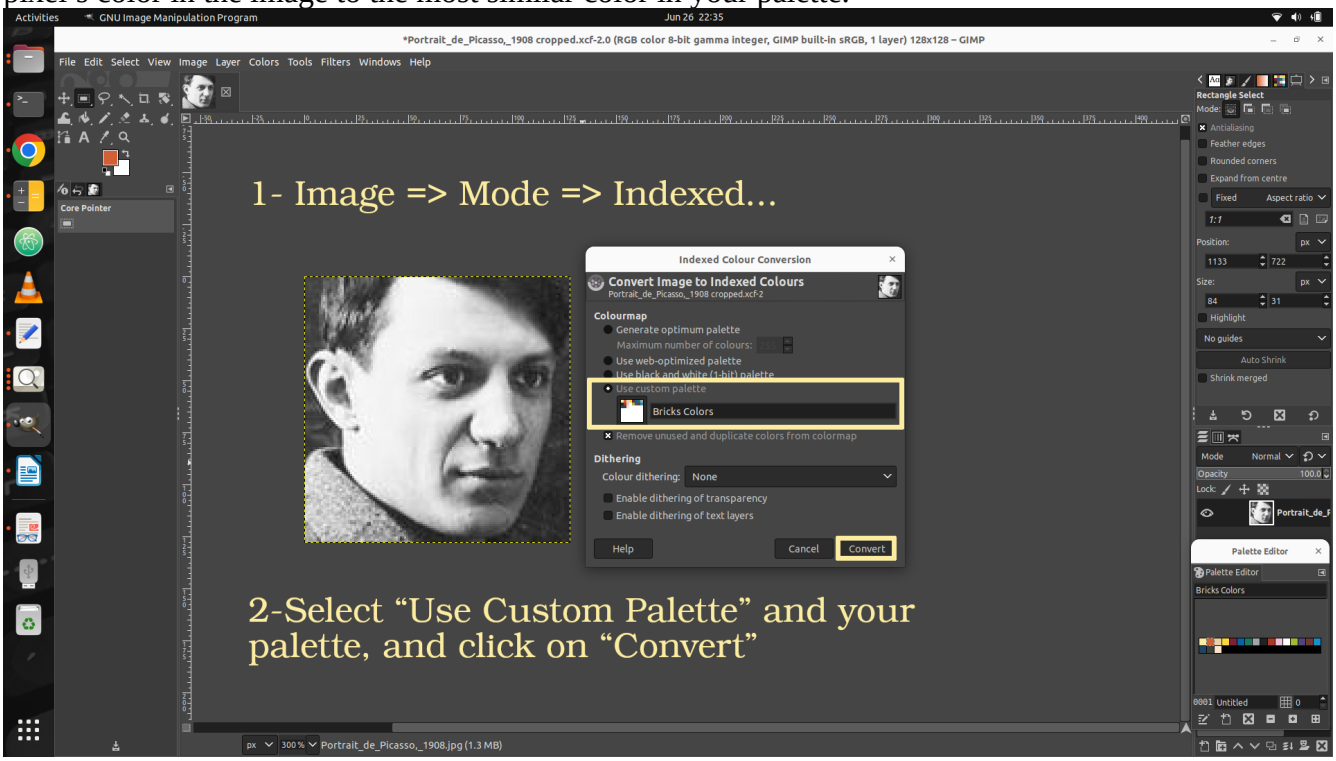


Converting Images Into Pixel Art Templates Using Your Color Palette:

Step 1. Open your image in GIMP and then go to the “Image” menu and select “Canvas size...”. You will need to select dimensions that are a multiple of the number of pegs on the corresponding sides of your mosaic. In the example below, I am using a 128 x 128 pixel cropped image to generate the pixelated image that will serve as the template for a 64 x 64 peg mosaic (2 x 2 square of base plates, each of which consists of 32 x 32 pegs). During the pixelation step, each pixel in the 128 x 128 pixel image will be merged with its horizontal and vertical neighbor in order to yield aggregated pixels of a size of 2 x 2 pixels, each mapping to its corresponding 1 x 1 plate in the mosaic. As such, **the number of aggregated pixels in each dimension of your image after the pixelization step should match the number of pegs on the corresponding side of your mosaic**



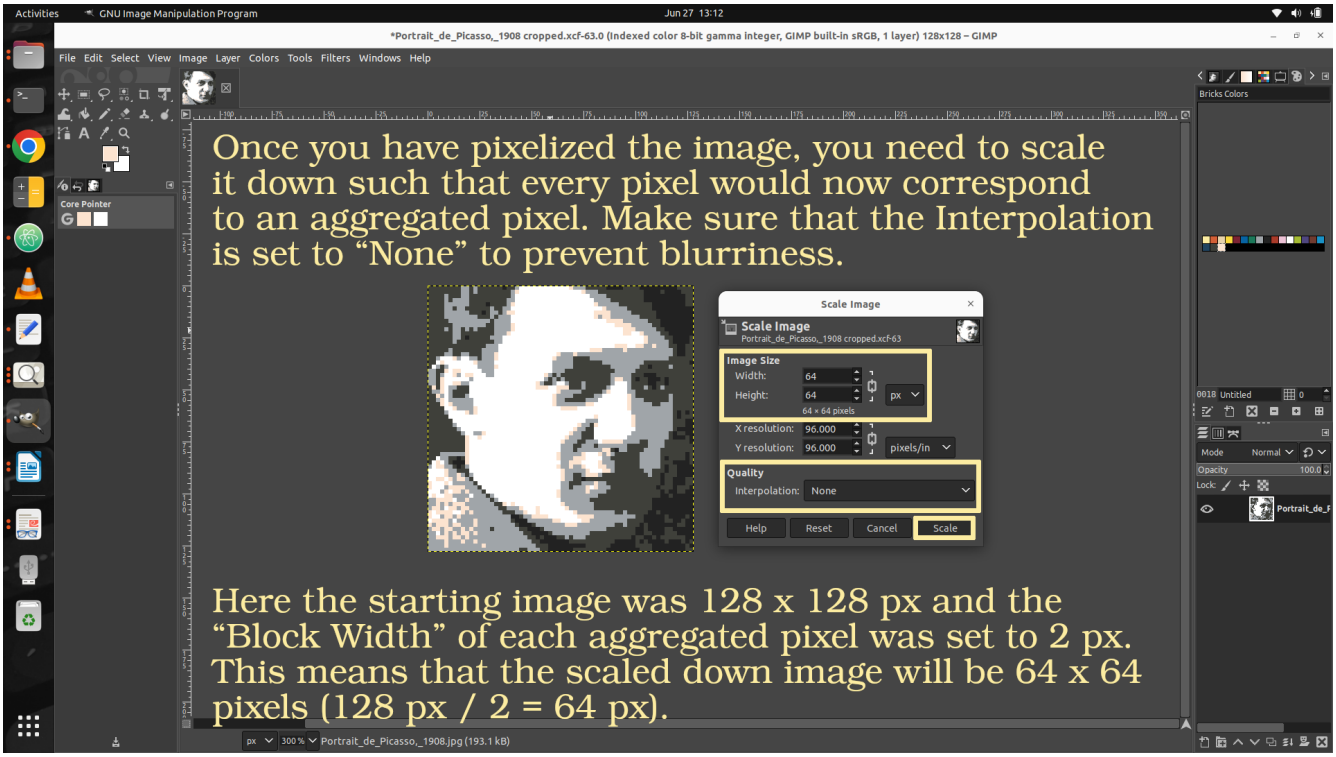
Step 2. Go to the “Image” menu and select the “Mode” option, followed by the “Indexed...” mode. Select the “Use Custom Palette” and your palette, and click on “Convert”. This will transpose every pixel’s color in the image to the most similar color in your palette.



Step 3. From the “Filters” menu, select the “Blur” option, and then “Pixelize”. The “Block Width” and “Block Height” parameters will determine how many individual pixels are aggregated together to form a square cell in your pixelated image. You will need the value of “Block Width” and “Block Height” to be the same in order to get square pixels, as your 1 x 1 base plates are squares themselves. Furthermore, **the number of aggregated pixels in each dimension of your pixelated image should match the number of pegs on the corresponding side of your mosaic**. In the example mentioned above, the starting cropped image measures 128 x 128 px, and each pixel is then merged with its horizontal and vertical neighbor in order to give aggregated pixels of a size of 2 x 2 px. This way, each 1 x 1 plate making up the 64 x 64 peg mosaic would map to an aggregated pixel (128 px / 64 = 2 px). This is important, as the Python code will “walk” along the image, one aggregated pixel at a time, to determine the color of the pixel, so the relative dimension of these must line up with those of your mosaic.

Step 4. After the pixelization step, you will need to scale down the image, such that each aggregated pixel would now constitute one pixel. This will make it easier to edit your pixelated image. In the example above starting from a 128 x 128 px cropped image, the dimensions of each aggregated pixel was set to 2 x 2 px. This means that the scaled down image will have dimensions of 64 x 64 px (128 px / 2 = 64 px). From the “Image” menu, select “Canvas size...” and adjust your width and height accordingly. Also, set the Interpolation to “None” in order to prevent any blurriness.

Before exporting your image, you need to make sure that there is at least one line in your pixelated image of a width of a single pixel, or at least one isolated pixel surrounded by pixels of a different color (such as the grey pixel in the pink patch of Picasso’s forehead in the image below). This requirement allows the code to figure out how many actual pixels make up an aggregated pixel, which is important to properly determine the color of each aggregated pixel, and elaborate the top and side panel clues based on this information.



Step 5. At this stage, you may make corrections to your image, while keeping them within the available colors of your palette. Select the “Show Grid” and “Snap to Grid” options from the “View” menu to facilitate your task.

You may also want to have guide lines delimiting the different base plates making up your mosaic. You would then need to select the “New Guide...” item from the “Guide” option of the “Image” menu. Specify the number of horizontal and vertical pixels where you would like your guide lines to be visible (they won’t be present in the finished image). In this example with the scaled down 64 x 64 px pixelated image, as the mosaic is made up of two base plates in either dimension, the guide lines are drawn at the halfway point (32 pixels).

You will need to revert the mode of your image back to “RGB” in order to be able to use all the colors of your palette in it. Head over to the “Image” menu, and then select “mode” and “RGB”.

When using the “Pencil Tool”, make sure that the mode is set to normal and the opacity is 100%. The 100% opacity is important because it will avoid you ending up with different shades of the same color by overlaying the new color over the old one. Should you need to make corrections, you could use the “Rectangle Select Tool” to select the pixels, hit the “Delete” button to remove those pixels, and then left-click to clear your selection before clicking on the “Pencil Tool” again to resume drawing.

Keep in mind that when generating pixelated images, the number of color transitions from one pixels to the next on any given row or column, excluding the blank pixels, should be at most 23, in order for all of the colored squares to be printed on the nonogram instruction sheets. The code automatically checks for this, and will let you know if there are any issues and where to correct them.

Once you are done modifying your pixelated image, simply export it as a PNG or JPEG file by selecting the “Export As...” option from the “File” menu.