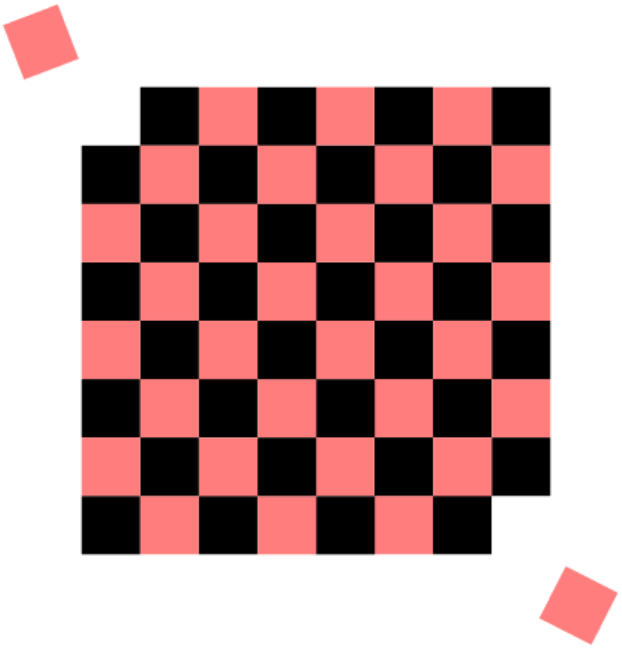
Essay 4.99999999999999999... : Parity (Puzzles) without the i (Well with it but you know what i mean) (Spain without the s ahh title) (Yes a short title from me how fun (the other 4 essays have over 10 words on the title so yeah well the first did until it didn't because it didn't really fit so yeah, it's still long in spirit at least i guess)) ('At least i guess' Jon how are you so insecure why are you like this) (Fun fact the title has exactly 18 nines and it happened by accident so oh yeah baby woooo) (Gosh Jon you've written more than ninety words and haven't even started on the real essay how?!?)

So as you've read in the title this essay is about parity and I'll talk about it using a few puzzles a few from myself and a bonus one from a puzzle game called 'The Artisan of Glimmith' —it's on steam it costs around 25 bucks something like that for over 1000 puzzles and it has a demo if you want to check that out but I'm getting off topic. So yeah this essay is similar to one of my other ones but I digress

Puzzle 0: (It says 0 because it's not mine) The mythical mutilated chessboard problem(Yes the puzzles here have titles because I like putting titles to stuff)

Imagine you have a normal chessboard only that two of its opposite corners have been cut. The question now is; Are you able to cover the board using 1x2 dominoes?



(Image from wikipedia)

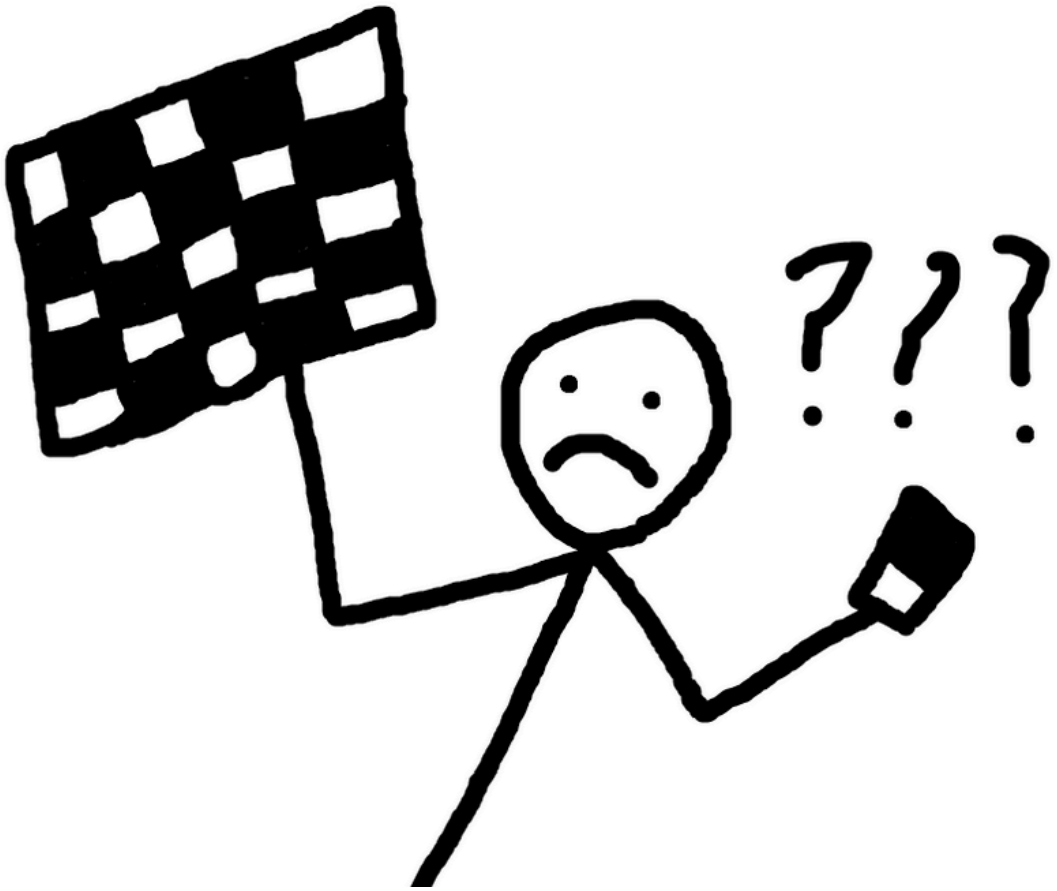
Solution to Puzzle 0: (In rot13 as to not spoil yourself)

Vg'f vzcbffvoyr.

Gur zbfg cbchyne cebbs sbe vg hfrf gur snpg gung vs lbh pbhag gur pbybhe bs gur fdhnerf (NXN gur cnevgl fvapr rirel juvgr fdhner bayl gbhpurf oynpx fdhnerf naq ivprirefn) lbh'yy dhvpxyl ernyvmr gung gurer'f zber bs bar pbybhe guna gur bgure, abj fvapr lbh'er hfvat 1k2 qbzvabrf rirel qbzvab lbh cynpr pbiref bar fdhner bs rnpu pbybhe ohg, fvapr gurer'f qvssrerag nzbhagf bs obgu pbybhef lbh pna'g pbire gur purffobneq.

Puzzle 1: The (W)hole problem

You have a 5x5 checkerboard now you want to cover it with 1x2 dominoes but you know that it’s impossible unless you remove at least one square. Now assuming that the top left corner of the board is white what color is the square you need to remove to be able to cover the board using the dominoes you have?



Solution to puzzle 1: (In rot13)

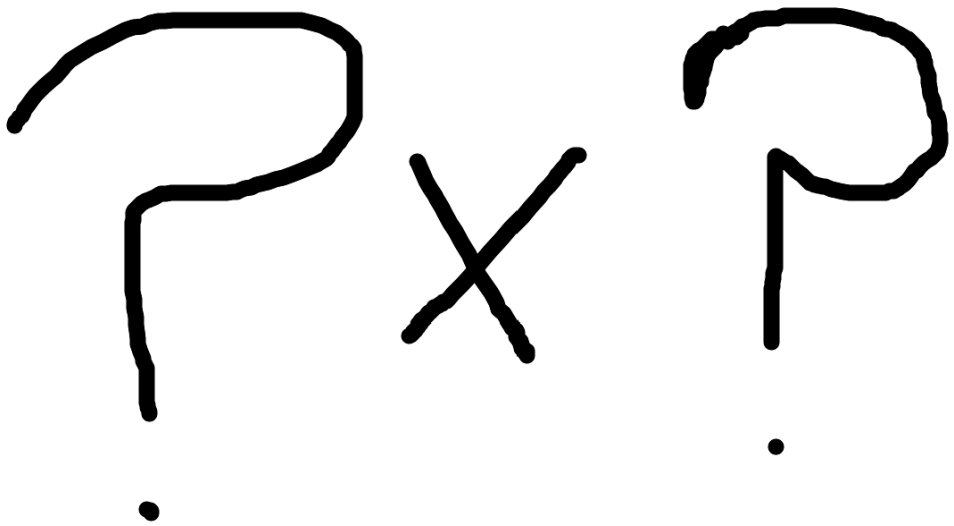
Gur pbybhe bs gur fdhner lbh'yy arrq gb erzbir vf juvgr.

Hfvat jung jr fnvq va gur cerivbhf chmmyr rnpu qbzvab unf gb pbire bar fdhner bs rnpu pbybhe; abj vs jr pbhag gur ahzore bs fdhnerf va rnpu pbybhe lbh'yy frr gung gurer'f 13 juvgrf naq 12 oynpxf fb fvapr gurer arrqf gb or fnzr ahzore bs rnpu lbh'yy arrq gb erzbir n juvgr fdhner.

(Sha Snpg: Lbh pna va snpg erzbir nal juvgr fdhner naq vg jbhyq or n obneq gung'f noyr gb or pbirerq jvgu qbzvabrf guvf pna or dhvpxyl purpxrq ol gelvat gb pbire gur obneq nsgre erzbivat bar bs gur pbearef, bar bs gur fdhnerf va gur zvqqyr bs gur rqtrf, bar bs gur juvgr fdhnerf fheebhaqvat gur zvqqyr bar, naq gur zvqqyr fdhner gur erfg vf boivbhf fvapr ebgngvbaf naq ersyrpgvbaf jbex naq znxr n inyvq obneq)

Puzzle 2: Boards and boards of all sizes:

In the same vein as the previous puzzle, consider any rectangular board of any size 1x1, 6x8, 9x10 etc… using any number of 1x2 dominoes, what is the colour that you'll always be able to cover fully without making the dominoes get out of the board if the top left corner of every board is white?



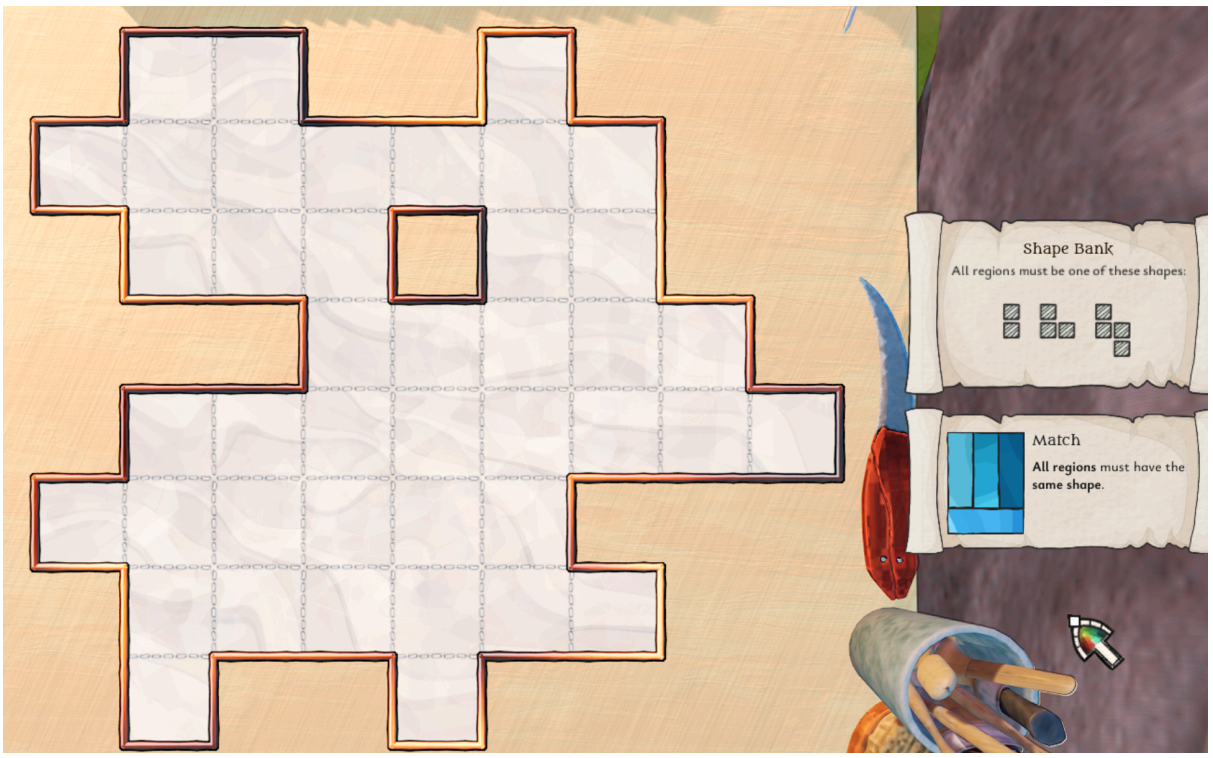
Solution to puzzle 2: (In rot13)

Gur pbybhe gung lbh'yy nyjnlf or noyr gb pbire vf oynpx be va bgure jbeqf gur pbybhe gung vfa'g va gur gbc yrsg pbeare. Bx ohg jul? Jryy vg'f dhvgr fvzcyr npghnyyl vs lbh erqhpr gur

obneq gb n 1k1 fvmr fvapr lbh pna'g cynpr nal 1k2 gurer juvgr vf nyernql qvfpneqrq ohg gung qbrfa'g zrna gung oynpx nyjnlf jbexf; Sbe gung guvax bs ubj rirel gvzr lbh nqq n arj pbyhza lbh rvgure fjvgpu gur obneq sebz orvat bar jvgu obgu fvqr yratguf orvat rira gb bar jurer bar vf rira naq gur bgure'f bqq. Abj rirel obneq gung unf obgu fvqr yratguf nf rira ahzoref vf pbire-noyr jvgu qbzvabrf lbh pna whfg cynpr gurz bar orybj gur bgure naq gb gur fvqrf va n tevq yvxr snfuvba hfvat guvf jr pna erzbir nal rira ahzore bs nqwnprag ebjf be pbyhzaf sebz nal obneq fvapr gubfr ner nyjnlf pbasvezrq juvpu rvgure yrnirf lbh jvgu n 1 ol k obneq jurer k vf nal ahzore be na rzcgl obneq jvgu ab fdhnerf ng nyy. Abj jvgu n 1 ol k obneq jr pna fubj gung gurer nyjnlf or n fdhner jvgu gur pbybhe bs gur gbc yrsg pbeare yrsg vs k vf bqq (vs k vf rira jr ner yrsg jvgu rirelguvat pbirerq) orpnhfr gur pbybhef ner vagrecbyngrq fb rirel juvgr zhfg or sbyybjrq ol n oynpx naq ivpr irefn (guvf jbexf jvgu nal 2 pbybhef V whfg hfrq gubfr fvapr gurl'er gur onfvp barf) abj fvapr jr fgneg jvgu n fvatyr fdhner gur arkg jr nqq vf bs n qvssrerag pbybhe naq gur arkg bar bs gur pbybhe bs gur svefg fdhner naq fb ba.

Onfvpnyyl guvf jbexf orpnhfr bqq ahzoref ner bqq naq rira ahzoref ner rira (Nyfb lrf V xabj guvf rkcynangvba vf onq jung lbh qba'g trg vf gung v'z irel gverq naq univat n urnqnpur naq BU TBQ GUR PHGBSS VF VA 2 UBHEF!!!!!!!)

Bonus puzzle: (This one doesn’t have a title because look they/them I’m tired) (The rules of this puzzle that aren’t stated on the side of the image is that the whole white are must be divided into regions that’s about it so grab paint (or any other image editor) and get to it) (Also I’m not going to put the answer of the puzzle just give a few hints (yes they are only for this puzzle) that are in rot 13 if you want them)



Hint 1: Bar bs gur funcrf vfa'g yvxr gur bgure barf. (This isn’t part of the hint but why is the space between the : and the 1 so big?)

Hint 2: Gel bireynccvat n pregnva cnggrea gung jr'ir gnyxrq nobhg va guvf fnzr rffnl. Vfa'g vg gurer fbzrguvat gung cbcf hc gb lbh nf fgenatr?

Hint 3: Lbh'yy chg gur fnzr funcr 14 gvzrf.

Special hint: Bapr lbh'ir svyyrq va jung zhfg or sbeprq va gur fbhguzbfg cneg gur jnl gung lbh svyy gur erfg bs vg vf ol abg qbvat n erpgnatyr n 2k3 gb or rknpg.

(Yeah I copied this whole bit from the professor Layton series. What are you gonna do, sue me?)