Homework 10, Morally Due Tue Apr 23, 2013

COURSE WEBSITE: http://www.cs.umd.edu/~gasarch/858/S13.html
(The symbol before gasarch is a tilde.)

1. (0 points) What is your name? Write it clearly. Staple your HW. When is the FINAL (give Date and Time)? If you cannot make it in that day/time see me ASAP. Join the Piazza group for the course. The codename is cmsc858.

2. (50 points) Prove that $W(3,4)$ exists. From your proof one should be able to get a bound on it (NOTE- you may say things like *Let* $N = 2^{1098970983}$ and later use N freely. That is, I don't need to see the actual number.

3. (50 points) An L-shape will mean three points of an ISOSCELES Right triangle, in the shape of an L (So has to be

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   Cannot be

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   (a) Prove that there exists a number $L(2)$ such that, for all 2-colorings of $[L(2)] \times [L(2)]$ there is a Mono L-shape.

   (b) Prove that there exists a number $L(3)$ such that, for all 3-colorings of $[L(3)] \times [L(3)]$ there is a Mono L-shape.

   (c) Sketch a proof that, for all c there is a number $L(c)$ such that, for all c-colorings of $[L(c)] \times [L(c)]$ there is a Mono L-shape.

   (d) Show that there exists a number S such that for all 2-colorings of $S \times S$ there exists a monochromatic Square.

   (HINT- You can either USE VDW's theorem to prove this, or prove it from first principles, though that proof reminds one of the proof of VDW's theorem.)