

Final TO DO for New Ramsey

1 K_3

Your programs have done

For $n = 5$ to 10 generate MANY 2-colorings and see how many mono triangle you get

You took the average.

1. I also want to know MAX number of mono triangles and MIN number of mono triangles.
2. I want you to go further than 10. Go until its taking 10 minutes.
3. Plot the MAX, MIN, and AVG to see what the growth rate is. I suspect $An^3 + Bn^2 + Cn + D$ for some A, B, C, D though you may not have enough data to really see this.

2 K_4 and K_5

Your programs have done

For $n = 5$ to 20 generate MANY 2-colorings and see how many mono K_4 s you get

You took the average.

1. I also want to know MAX number of mono K_4 's and MIN number of mono K_4 's.
2. I want you to go further than 20. Go until its taking 10 minutes.
3. Plot the MAX, MIN, and AVG to see what the growth rate is. I suspect $An^4 + Bn^3 + Cn^2 + Dn + E$ for some A, B, C, D, E though you may not have enough data to really see this.
4. Do all of the above for looking for mono K_5 's.

3 Probability

Some of you wrote a program for the question:

When is the prob of getting a $K_3 \geq 0.9$.

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ALSO do for $K_5, K_6, \dots$ until it takes more than 5 minutes.

ALSO- I suspect that

For 2-coloring K_{17} you will ALWAYS find a K_4 since the number of colorings where you don't is so small.

I'll be curious what the largest n is such that if you 2-color K_n you see a coloring WITHOUT a mono K_4 at least once.

Similar questions for K_3 .

4 Report

After you collect up all of this data make a report out of it.

When the report is done, email it to me. I will read it and then set up a meeting to discuss it.

If any of you are doing this for a required project, we will also discuss what you need to do with the report to satisfy your schools requirements.