COS 340 / Fall 2020 / Problem Set 5 Grade Report

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Precept/Preceptor: P03/Girish

Problems	Max Points	Points
Problem 1	20	20
Problem 2	20	12
Problem 3	20	20
Problem 4	20	12
Problem 5	20	16
Problem 6	20	19
TOTAL	**120**	**99**

Deductions & Comments

Problem 1. Excellent! Note that at the end of point 2., you have not yet shown that G' is 4-colorable if and only if G is 3-colorable. You have only shown the only if direction and in the next paragraph, you show that if direction. It would have made more sense to put this paragraph before the last line.

Problem 2. Your reduction is correct, but it requires a little more justification why G has a perfect matching if and only if there are k disjoint paths. This is the main part of the problem! (-8)

Problem 3. Excellent!

Problem 4. Good attempt! In the case that b is at least a/2, why is a mod b less than or equal to a/2? This is true but requires justification. (-8)

Problem 5. Well done! Note that you have only shown that for every two vertices, Bob figures out whether they have the same color or not. How does he derive a coloring from this information? (-2)

Why exactly does Bob derive a valid coloring? Note that it is irrelevant whether Bob can check whether he has a proper coloring or not. His goal is to always output a valid coloring (under the assumption that Alice is correct.) and you need to show that this is always the case. (-2)

Problem 6. A similar comment to problem 1. What role does the paragraph starting with "Likewise, …" play? It seems that you are constructing an instance of vertex-set from hitting-set, but this is not required right?

The mapping is not clearly defined. It would have been best to explicitly write, let A=V, {A_1,...,A_m}=E and k=l. (-1)