

MAJOR ASSIGNMENT # 1

Do the following problem. Show **all** work. Your well-written solution is more important than your final answer. I encourage you to work in small (no more than three) groups. However, each person must submit their own solutions. You may share any insights with your group **but you may not share anything outside your group**. Remember that your group members and instructor are the only people you can ask for help with this assignment. This is not a research project. I will be interviewing two randomly selected people to make sure that they understand their solutions. You will receive a zero if you cannot support your work.

An island with no contact with the outside world has twenty inhabitants. Blue-eyed people on this island are banished to the mountains in the center of the island but this rule can only be self-enforced. In other words, no one will make the blue-eyed person go to the mountains, they must go on their own. The island has no mirrors and it is a strict taboo to talk about eye color with anyone. One day a traveler appears on the island and says, "There are blue-eyed people here." and is immediately eaten by the islanders because he spoke of eye color. A few days later all the blue-eyed people leave for the mountains together. Everyone knew there were blue-eyed people on the island, because they could see it when they looked at each other, but the blue-eyed people only left after the traveler, may he rest in peace, announced this fact.

- a) Explain what happened to make the blue-eyed people leave.
- b) If it took one day for each person to make her/his decision, how many days was it until the exiles left?