Activity 1

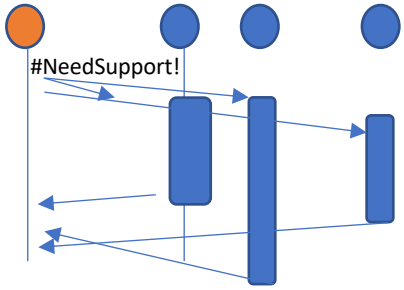
A. Distributed Systems: A group communication with sockets

Write a Python program using Socket[1] library to simulate an asynchronous communication among agents in a shared channel. Thus, they send and receive information in the same channel.

You need to implement 4 agents. One of them requests help from the others: it knows them, sends a message asking for support, and waits some period for their replies. Each agent that receives a help request must compute its decision during a random time interval and then act as follows:
- 40% of the time, it replies with a help message ("ok!").
- 50% of the time, it replies with a denial ("no!").
- 10% of the time, it sends no response at all.

When the requesting agent receives two help responses, it considers its request satisfied.
This agent periodically makes new help requests at random intervals. As a result, there will be valid periods of requests and responses, that is, messages associated with timestamps ("No_i" and "Ok_i").

Your task is to design and implement this behavior, taking randomness into account. In addition, implement a monitoring log and, based on it, compute the quorum satisfaction degree over a fixed number of periods.



Note:
- Explain with code comment relevant steps (TCP or UDP)

Deliverable:
- Include this project in a public repository (i.e. GitHub, Bitbucket, etc.)

[1] https://docs.python.org/es/3/howto/sockets.html