**Fault-Detection Using Heartbeat**

**Objectives:**

This homework makes you familiar with design and implementations of architectural tactics. An important goal of this assignment is to emphasize that designing architecture is important but implementing the design, testing and maintaining the design decisions are critical.

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You are supposed to implement “Heartbeat” Tactic. The implementation is minimum prototyping of the tactic than full implementation of a system.

Please consider the following items:

1. **Select a key *software functionality* in your autonomous self-driving vehicle case study**. This functionality needs to be related to your availability quality attribute scenario written in previous activity. For instance, a critical software functionality can be “Obstacle Detection”. Software of a Self-Driving Car needs to actively monitor a module that implements this function to identify whether is running or has crashed or is not responding.
2. **Develop a critical process (with minimum functionality)**. Implement main functionalities of your critical module. For instance, have a few methods implementing obstacle detection feature. This needs to be a close approximation of the functionality not a full implementation.
3. **Design a Non-deterministic failure in this process which makes it crash**. Please create a realistic issue that makes your process not responding. DO NOT use process.exit and similar commands.
4. **Implement Heartbeat to monitor the process**
5. Your heartbeat implementation should have all the required fault detection features.

**Rule 1:** Do not embed a failure in a static if statement. The failure must be random and it must cause the process crash, avoid making the process sleep.

**Rule 2:** Implement send/receive/monitoring functions on **different processes**

**Rule 3:** You can use the existing frameworks or implement from scratch.

**Deliverables:**

* Runnable Source Code
* Read me file including guidance on how to run the code, list of frameworks used.
* Documentations if necessary