UiO / IFI / PUT
Spring 2025
Questions on Adaptability

1. Consider the notion of adaptability. Present its definition and give some examples.

2. It is well known that static partitioning fails to account for the variability inherent in mobile and pervasive computing environments. Present five cases that justify the previous sentence.

3. Consider the need of a mobile/ubiquitous system to adapt automatically to the context. Present and example in which the high speed at which a system is capable to adapt is good and another example in which such high speed is not good.

4. Consider the notions of **mobile-transparent** and **mobile-aware** applications (as stated in the Rover system) and the following sentence: "*This approach aims to enable applications to actively adapt to the conditions of mobile environment*". To what notion (from the previous two) does this sentence applies? How is transparency achieved if the other notion is followed?

5. Consider a system that, for adaptability purposes, supports **computation offloading** from a mobile device to a server on the cloud in run-time, i.e. while an application is running. Assuming that the application is written in Java, can this be done without modifying the java virtual machine?

6. For service discovery, the **SLP (Service Location Protocol)** is a possible solution. What is the mechanism that is used to deal with misbehaved service agents that do not unregister the service when it is no longer offered?

7. Consider the following statement: "Applications can be automatically adapted to the varying conditions of mobile environments by exclusively fine-tuning the operating system; thus, no changes are required to the source code of applications." Do you agree with this statement? Illustrate your viewpoint with an example.

8. A possible solution to deal with the lack of networking while allowing the user to keep on working with his mobile device is provided by the system Rover.
    a. What are the two most relevant techniques proposed by Rover? How do they work?

    b. Does Rover handle conflicts? Describe a scenario in which such a conflict situation may arise and explain how Rover deals with it.

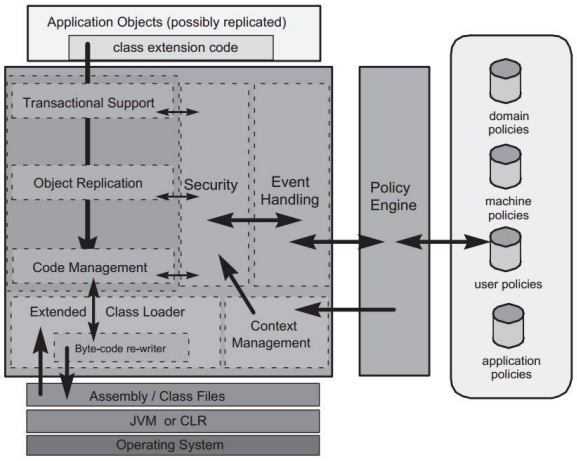
9. What type of variations in the resources must be taken into account?

10. What resources should a system be made adaptable to?

11. How can we measure the effectiveness of adaptability mechanisms? Explain what each one is.

12. At what level should the adaptability solution be implemented? What are the pros and cons of each one?

13. Describe the following figure (possible generic Architecture for Adaptability) and explain its components.



14. What kind of policies can be envisaged? Explain each one.

15. Why is the term “sessions” used instead of “transactions”?