**Homework #4**

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**Part 1:**

**The challenges involved in regression testing mobile applications are:**

1. **Pricing** - Different testing tools have different pricing ranges based on the use of the tools.
2. **Requires additional testing** - Rerunning test cases is necessary whenever the mobile application is modified. It can take a lot of time, and if only a tiny change was made, it might not even be necessary. [2]
3. **Needs additional resources** - Regression testing for mobile devices might need extra resources, like specialized testers or test servers. Additionally, it may be pricey.
4. **Different OS available** - Android and iOS [1]

**A regression testing tool applicable for mobile applications is:**

There are various tools available for regression testing, the one I have chosen is : **Appium**

**How the tool addresses the challenges you identified:**

1. Appium is open source software, hence there’s no cost for using the software
2. We usually don't have to recompile the app or modify it in any way, due to the use of standard automation APIs on all platforms.
3. As Appium supports automation of test cases, there is not much need for any specialized testers or test servers which can reduce the cost of testing. The testing can be automated by using CI/CD approach.
4. The Appium cross-platform feature enables writing tests on iOS and Android platforms using the same API. A client written in any language can be used to send appropriate HTTP requests to the server. [3]

**Part 2: Describe how AI and Machine Learning are being used to test mobile applications.**

By including AI and machine learning into mobile testing tools, development and testing teams are now capable of leveraging AI/ML technologies to boost automation, make faster adaptation, and more effective operation.

**Some of the use cases of using AI/ML in testing of mobile applications are:**

1. **Log Analysis** - Identifying unique test cases for manual and automated testing.
2. **Optimizing Testing Suites** - Identify and get rid of recurring and unnecessary test cases.
3. **Optimum Test Coverage** - Ensure optimum test coverage by using the Requirements Traceability Matrix (RTM).
4. **Predictive Analytics** - Identity key app areas and prescribing the key testing parameters for prediction.
5. **Defect Analysis** - Identifying various app areas and corresponding app defects that require repair work.

**Some advantages of using AI/ML for software testing are:**

1. ML algorithms use data analytics and app performance results to improve or write new test cases.
2. Generating test cases that provide better coverage. Generating test cases in an automated way.
3. Decrease time taken to release products to market by selectively running test suites based on the decision taken by ML algorithms.
4. Make product more reliable by using ML to detect potential bugs in early software development stage.
5. AI based testing tools require minimal supervision and intelligently test the software at hand by selecting the most appropriate test cases/scripts. This, thereby, supports continuous testing.

Some of the software which use AI/ML in testing mobile applications are: Testigma, Applitools, Appvance, ACCELQ, Test.ai, Katalon etc.

**References**

[1] <https://medium.com/trendyol-tech/regression-testing-in-mobile-development-c4895f262fb9>

[2] <https://www.waldo.com/mobile-testing/types/regression-test>

[3] <https://medium.com/deviniti-technology-driven-blog/mobile-application-automation-testing-using-appium-b4fe488838db>

[4] <https://techbeacon.com/app-dev-testing/how-ai-changing-test-automation-5-examples>

[5] <https://blog.bitrise.io/post/ai-and-machine-learning-mobile-testing-tools>