Mobile Network Course Project
University of IUST

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1 Introduction

This project is part of the **Mobile Network** course at the University of **IUST**. The goal of this project is to provide students with an opportunity to apply the concepts they have learned in the course. The project consists of five different projects, and each two students will pick one from these projects. The source code should be placed on GitHub, and it needs to have a readme.md that has the project name, project students, and some related information about how they did the project (technologies used and methods, researches, etc.).

2 Projects

2.1 Project 1

Develop an Android app that monitors mobile network traffic and provides users with insights into their data usage patterns.

2.1.1 Project Description

This project involves developing an Android app that allows users to monitor and track their mobile network data usage. The app will provide users with the ability to view their current data usage, get insights into their data usage patterns, and set usage limits to help them stay within their data plan limits.

The app will start by allowing users to connect to their mobile network and view their current data usage. This will involve capturing the data usage from the network provider and displaying it in an easy to understand format.

Next, users will be able to view their data usage patterns. This feature will enable users to view a graphical representation of their data usage over time and identify trends or patterns in their usage.

Finally, the app will allow users to set usage limits so they can better manage their data usage. This will involve setting an upper threshold for data usage and providing users with notifications when they are close to exceeding their limit.

2.1.2 Implementation

The implementation of this project will involve several different steps. First, the application will need to be built using Android Studio and the Android SDK. Development should focus on ensuring the application is optimized for speed and usability.

Next, the application will need to be able to connect to the mobile network and capture the data usage information from the network provider. This will involve leveraging APIs from the network provider to get the data usage information and display it in an understandable format in the app.

Once the data usage information has been captured, the application will need to be able to analyze the data and provide users with insights into their data usage patterns. This will involve using data analytics techniques to identify trends or patterns in the data and displaying them in a graphical format.

Finally, the application will need to allow users to set usage limits. This will involve allowing users to set their desired limit and providing them with notifications when they are close to exceeding their limit.

Overall, this project involves the development of an Android app that allows users to monitor and track their mobile network data usage. The app will provide users with the ability to view their current data usage, get insights into their data usage patterns, and set usage limits to help them stay within their data plan limits.

2.2 Project 2

Build a mobile network performance optimization tool that uses machine learning algorithms to predict network usage patterns and optimize network performance accordingly.

2.2.1 Project Description

This project is to build a mobile network performance optimization tool that uses machine learning algorithms to predict network usage patterns and optimize network performance accordingly. The goal of this tool is to improve the performance and reliability of mobile networks for users.

The project will begin by researching existing machine learning algorithms and selecting one that is best suited for predicting mobile network usage patterns. After selecting the algorithm, the team will create a software application that will use the algorithm to analyze and identify patterns in mobile network usage.

Next, the team will develop the optimization tool that will use the identified patterns to adjust the performance of the mobile network. The optimization tool will be able to adjust parameters such as bandwidth, latency, and other settings to improve the performance of the network.

Overall, this project will involve researching, developing, testing, deploying, and monitoring a mobile network performance optimization tool. This tool will use machine learning algorithms to identify patterns in usage and optimize the performance of the network accordingly. The goal of this project is to improve the performance and reliability of mobile networks for users.

2.3 Project 3

Develop a mobile network signal strength mapping application that collects and visualizes data on signal strength and coverage in different geographic locations.

2.3.1 Project Description

This project involves the development of a mobile network signal strength mapping application that collects and visualizes data on signal strength and coverage in different geographic locations. The application will be used to track the signal strength and coverage of various mobile

networks in various locations. This application will provide valuable insights into the quality of service provided by different mobile networks in various geographic locations.

The project will involve the development of an interactive application that will allow users to input the geographic location and mobile network of interest. The application will then collect data on signal strength and coverage in the specified geographic location. The application will also provide visualizations of the collected data and allow users to compare the signal strength and coverage of different mobile networks in different locations.

To ensure the accuracy of the data collected, the application must be equipped with advanced algorithms to determine the signal strength and coverage of different mobile networks in different locations. The application must also be able to store the collected data and be able to display it in an easily understandable visual format.

To ensure a user-friendly experience, the application must be designed with a user-friendly interface. The interface must be intuitive and easy to navigate, allowing users to quickly access the information they need. The application must also be compatible with a variety of mobile devices and platforms in order to reach a wide range of users.

In order to ensure the success of the project, the development team must be experienced in mobile application development and should have an understanding of the various mobile networks and their coverage in different geographic locations. The team must also have an understanding of the various algorithms and techniques used for collecting and visualizing data on signal strength and coverage in different geographic locations.

Overall, this project involves the development of a mobile network signal strength mapping application that collects and visualizes data on signal strength and coverage in different geographic locations. The project must include the development of an interactive web-based application, advanced algorithms, a user-friendly interface, testing and documentation plans, and a deployment plan. The development team must have experience in mobile application development and should have an understanding of the various mobile networks and their coverage in different locations.

2.4 Project 4

Network Anomaly Detection using Machine Learning

2.4.1 Project Description

This project involves the use of machine learning algorithms to detect network anomalies. An anomaly is an event or behavior that deviates from the normal or expected activity. Anomaly detection is the process of detecting abnormal behavior in a data set. Network anomalies can occur in a variety of forms, from malicious intrusions to misconfigured devices and may result in data loss or service disruption. This project seeks to use machine learning algorithms to detect and classify these anomalies in a network.

The first step of this project will be to identify and collect data that can be used to train the machine learning algorithms. This could include network traffic logs, authentication records, and system logs. This data will need to be pre-processed and cleaned up to ensure that the data is of high quality and suitable for use with the machine learning algorithms.

The next step will be to select and implement the machine learning algorithms that will be used to detect and classify the anomalies. Many different algorithms are available and the selection should be based on the type and amount of data being used. Common algorithms used for anomaly detection include neural networks, decision trees, and support vector machines.

Once the algorithms have been selected, it will be necessary to test them and develop rules for classifying the anomalies. This testing should be done on the collected data set to ensure the

accuracy of the results. Different techniques such as cross validation, k-fold cross-validation, and bootstrap can be used to test the accuracy of the algorithms.

Once the algorithms have been tested, they should be deployed in a production environment. This will involve setting up the necessary hardware, software, and infrastructure needed to monitor the network traffic. The algorithms should be regularly monitored and tested to ensure they are detecting the anomalies accurately.

The final step of the project will be to develop a user interface that can be used to view the results of the algorithms. This will allow users to review the detected anomalies and take action if needed. The user interface should also provide users with easy access to the necessary data and metrics needed to investigate the anomalies.

Overall, this project involves the use of machine learning algorithms to detect network anomalies. It requires the collection of data, the selection and implementation of the algorithms, the testing and development of rules for classifying the anomalies, the deployment of the algorithms, and the development of a user interface to view the results. With the right resources and expertise, this project can help to improve the security of a network by detecting and responding to anomalies in a timely manner.

2.5 Project 5

Analyze and optimize the Radio Interface Layer (RIL) in Android to improve the performance and reliability of mobile network communications.

2.5.1 Project Description

This project is aimed at analyzing and optimizing the Radio Interface Layer (RIL) in Android to improve the performance and reliability of mobile network communications. The primary goal of this project is to identify areas of the RIL that can be improved upon, as well as develop and implement solutions that enhance the overall user experience when it comes to mobile network communications.

The project will begin by researching and analyzing the existing Radio Interface Layer (RIL) code in Android. We will be looking for ways to improve the performance of the RIL, as well as identify any vulnerabilities or potential areas of improvement that can be addressed. Once any areas for improvement have been identified and documented, the next step will be to develop and implement solutions to address them. This will involve modifying and/or adding new code to the RIL, as well as testing and validating the changes in order to ensure they improve the performance and reliability of mobile network communications.

Once the changes have been made, the project will transition to the testing and validation phase. This will involve running various tests to ensure the changes have improved the performance and reliability of mobile network communications. This will involve running tests such as call quality, data throughput, and latency tests in order to ensure the changes have had the desired effect. Any issues that arise during this phase will need to be addressed and corrected in order to ensure the changes improve the overall user experience.

Once the testing and validation phase is complete and the changes have been verified to be effective, the project will transition to the deployment phase. This will involve deploying the changes to the Android devices and ensuring all users are able to benefit from the improvements. This will involve working with the various mobile carriers and/or device manufacturers in order to ensure the changes are properly implemented.

Overall, this project will involve researching and analyzing the existing Radio Interface Layer (RIL) code in Android, developing and implementing solutions to address any areas of improvement, testing and validating the changes, and deploying and maintaining the changes in order to improve the performance and reliability of mobile network communications.

2.6 Project 6

Develop a tool for measuring the quality of experience (QoE) of multimedia streams on the internet and identifying the factors that affect QoE.

2.6.1 Project Description

The goal of this project is to develop a tool for measuring the quality of experience (QoE) of multimedia streams on the internet and identifying the factors that affect QoE. The project must create a tool that can accurately measure QoE and generate reliable results that can be used to determine the quality of the multimedia streams.

The project will be divided into three phases. In the first phase, the project team will research and develop the necessary tools and technologies to create the QoE tool. This will involve researching existing technologies, such as media streaming protocols, content delivery networks, and analytics tools, and developing a new tool that is tailored to the specific needs of this project.

In the second phase, the project team will test the QoE tool and validate that it produces reliable results. This will involve measuring the QoE of various types of multimedia streams from a variety of sources, such as Varzesh3, Aparat, or some other streaming services. The team will also need to test the tool on different networks, such as Wi-Fi, 4G LTE, and 5G, to ensure the results are consistent across different connections.

In the final phase, the project team will analyze the results of the QoE tests and identify the factors that affect QoE. This will involve analyzing the data generated by the QoE tool, such as streaming speed, buffering time, and dropped frames, and determining which factors are most influential in determining the quality of the multimedia streams. The project team will also need to analyze the results in the context of different networks, devices, and streaming services.

By completing this project, the team will have developed a tool that can accurately measure the quality of multimedia streams on the internet and identify the factors that affect QoE. This will enable the organization to better understand the quality of their multimedia streams and ensure that users have an optimal experience.

2.7 Project 7

Build a solution that uses inertial navigation sensors and machine learning algorithms to provide GPS services in tunnels and other GPS-denied environments.

2.7.1 Project Description

The goal of this project is to build a solution that uses inertial navigation sensors and machine learning algorithms to provide GPS services in tunnels and other GPS-denied environments. This solution must be able to accurately track and record the position of a person or object in GPS-denied environments, such as tunnels, underground parking garages, and other places where GPS signals are not available.

The proposed solution will rely on the use of inertial navigation sensors such as accelerometers, gyroscopes, and magnetometers to accurately measure the motion of a person or object. These sensors will be used to measure the velocity and orientation of the person or object. The data collected from these sensors can then be used to estimate the position of the person or object in GPS-denied environments.

In addition to inertial navigation sensors, the proposed solution will also make use of machine learning algorithms. These algorithms will be used to detect patterns in the sensor data and

to make predictions about the position of the person or object. This will help to reduce the errors in the position estimates provided by the inertial navigation sensors.

The proposed solution must also be able to store the collected sensor data and position estimates for later analysis. This data will be used to further refine the position estimates provided by the inertial navigation sensors and the machine learning algorithms.

The proposed solution must also provide a user-friendly interface. This interface will allow users to view the collected sensor data and position estimates, as well as to configure the inertial navigation sensors and machine learning algorithms.

Finally, the proposed solution must be able to integrate with existing GPS systems. This will allow the solution to be used in combination with existing GPS systems to provide more accurate position estimates in GPS-denied environments.

The project will begin with a feasibility study to determine the best approach for implementing the proposed solution. This will include an assessment of the existing technology and the development of a proof-of-concept prototype. After the feasibility study is completed, the project will move into the design and implementation phase. This phase will involve the development of the inertial navigation sensors, machine learning algorithms, user interface, and integration with existing GPS systems. The project will also include testing and validation of the proposed solution to ensure that it meets the requirements and provides accurate position estimates in GPS-denied environments.

2.8 Project 8

Developing a Secure SMS-Based Employee Check-In/Check-Out System with Encryption, Data Integrity Checks, and Acknowledgment Mechanisms Using SMPP, Android SMS Manager, and GSM or Quectel Modems

2.8.1 Project Description

This project aims to create a secure system for checking in and out of employees for the purpose of tracking attendance. This system will use Short Messaging Service (SMS) with encryption, data integrity checks, and acknowledgment mechanisms. The system will be developed using the SMPP protocol, the Android SMS Manager, and GSM modems.

The SMPP protocol will be used as the communication protocol to send messages to and from the employee's mobile phone. It will handle the encryption of the messages, ensuring that the messages are secure and cannot be intercepted. It will also handle the data integrity checks, to ensure that the message has not been tampered with during transmission.

The Android SMS Manager will be used to store and manage the messages that are sent and received. This application will be used to track the check-in and check-out times of the employees, as well as other relevant information.

The GSM modems will be used to send and receive the messages from the employee's mobile phone. The modems will be used to connect to the mobile network and communicate with the employee's phone.

In addition, acknowledgment mechanisms will be used to ensure that the messages have been received by the employee's phone. This will involve sending an acknowledgment message whenever a check-in or check-out message is received. If the acknowledgment message is not received, the system will resend the message until an acknowledgment is received.

The system will be tested to ensure that it is reliable and secure. Once the system has been tested, it will be deployed to the company's network. Documentation will be created to ensure that employees are aware of how to use the system.

Overall, this project aims to develop a secure system for checking in and out of employees. The system will use SMPP, Android SMS Manager, and GSM modems to ensure that the

messages are secure and that data integrity checks are performed. Acknowledgment mechanisms will also be used to ensure that the messages have been received and understood.

2.9 Project 9

Developing an Augmented Reality Game for Exploring Mobile Network Signal Strength and Coverage with Engaging Side Missions

2.9.1 Project Description

This project is aimed at creating an engaging augmented reality (AR) game for exploring mobile network signal strength and coverage. The game should be designed to be fun and entertaining while providing users with valuable information about the strength and coverage of their cellular networks.

The game should feature a variety of side missions and activities to keep players engaged. These could include collecting points, scavenger hunts, puzzles, and more. The game should also feature an in-game leaderboard to keep track of the players' progress and provide incentives for continued play. Additionally, the game should allow users to share their scores with friends and other users through social media and other platforms.

The game should also feature a map and an easy-to-use interface for plotting the location of good and bad signal coverage. This should be done in a manner that is easy to understand and navigate. The game should also provide information about the signal strength and coverage in the area, such as the type of signal, approximate speed, and more.

The game should also provide users with a way to share their results with others. This could be done through a leaderboard, or by allowing users to share screenshots, videos, and more. Additionally, the game should allow users to save their progress so they can continue playing where they left off.

Finally, the game should also feature an analytics component that allows users to access and analyze data about the signal strength and coverage in their area. This should be done in a manner that is easy to understand and navigate.

The game should be designed to be enjoyed by users of all ages and abilities. It should be intuitive and easy to use, while also offering an engaging and entertaining experience. The game should also be optimized for both mobile and desktop devices.

Overall, this project seeks to develop an augmented reality game for exploring mobile network signal strength and coverage that is fun, engaging, and informative. This game should provide users with a great way to explore their cellular networks and easily access valuable information about the strength and coverage of their networks.

2.10 Project 10

Building a Tailored Android OS: Eliminating Default Apps and Incorporating New Ones for an Optimized User Experience and Improved Device Performance

2.10.1 Project Description

The goal of this project is to build a tailored Android OS that eliminates default apps and incorporates new ones to optimize the user experience and improve device performance. The new OS will be tailored to specific user needs and preferences, providing a personalized experience that offers faster loading times and improved usability. The project will involve a comprehensive analysis of existing Android OS, selecting the best apps for the new OS, and developing the new OS.

The first step of this project is to analyze the existing Android OS. The analysis should identify existing applications that can be eliminated to improve device performance and user experience. This can involve researching and comparing existing OS to determine which apps are most commonly used, as well as identifying and evaluating apps that are not essential to the user experience. The analysis should also consider the overall design of the OS, such as the layout of the home screen, the navigation controls, and the available settings.

The next step is to select the best apps for the new OS. This will involve reviewing apps that are available on the Google Play Store, as well as any custom applications that may be developed for the new OS. The apps should be selected based on their ability to improve device performance and user experience, as well as their compatibility with the OS. The apps should also be tested to ensure that they are secure and stable before being included in the OS.

The third step is to develop the new OS. This will involve creating a new interface design, incorporating the selected apps, and testing the OS. The interface design should be tailored to the user's needs, with a focus on providing an enjoyable and intuitive experience. The apps should be incorporated into the OS in such a way that they work together to improve device performance and user experience. The new OS should also be tested to ensure that it is secure and stable.

Finally, the new OS should be deployed to the user's device. Once the OS is deployed, the user should be given instructions on how to use the OS and the available apps. The user should also be provided with support and assistance when needed.

By the end of this project, a tailored Android OS should be created that eliminates default apps and incorporates new ones for an optimized user experience and improved device performance. This new OS should provide a personalized experience, with faster loading times and improved usability. The project should also provide the user with instructions on how to use the OS and the available apps, as well as support and assistance when needed.

2.11 Project 11

Automated QoE Testing of Instagram App Using UI Automation and Server-Based Interaction Guidelines

2.11.1 Project Description

This project involves automating Quality of Experience (QoE) testing of the Instagram app using UI automation and server-based interaction guidelines. The goal of this project is to develop a testing system to measure the performance of the Instagram app on different devices and operating systems.

To achieve this goal, the project will involve the development of a number of components. First, the project will require the development of an automated testing tool that can be used to measure the performance of the Instagram app on different devices and operating systems. This tool should be able to measure a variety of metrics, such as launch time, loading time, responsiveness, and stability. The tool should also be able to measure the performance of the app under different network conditions, such as Wi-Fi, cellular networks, and satellite connections.

Second, the project will require the development of server-based interaction guidelines. These guidelines will determine how the Instagram app runs the test and what types of information it should collect. This will ensure that the tests are conducted in a consistent manner and that the results are accurate.

Third, the project will require the development of a reporting system. This system will generate reports on the performance of the Instagram app on different devices and operating systems. The reports should contain detailed information about the results of the tests and

provide a comparison of the performance of the app across different devices and operating systems.

Overall, this project will involve the development of a comprehensive testing system that can accurately measure the performance of the Instagram app on different devices and operating systems. The system should be able to accurately measure a variety of metrics, such as launch time, loading time, responsiveness, and stability, and should generate detailed reports on the performance of the app. Additionally, the system should provide the user with an intuitive user interface for customizing the tests and reviewing the reports.

2.12 Project 12

Android app for machine learning-based QoE evaluation of streaming media in WebView

2.12.1 Project Description

This project involves the development of an Android app for machine learning-based QoE (Quality of Experience) evaluation of streaming media in WebView. The goal is to measure the user's experience while streaming media in WebView, such as videos, images, and audio. The app should be able to use various machine learning-based algorithms to collect and analyze user data, such as user preferences, user interactions, and media streaming performance.

The app should be able to provide an efficient and accurate QoE evaluation of the streaming media in WebView. This should be done through the use of various machine learning-based algorithms, such as supervised learning, unsupervised learning, and deep learning. The model should be able to recognize user preferences and user interactions, as well as identify and categorize the streaming media in WebView.

The app should provide the user with a comprehensive report of the QoE evaluation. This report should include the most relevant metrics, such as the loading time, buffering time, video quality, and audio quality. The app should also allow for the user to customize the report, so that they can view specific metrics that are most relevant to them. Furthermore, the app should allow for the user to compare the QoE evaluation of different streaming media in WebView.

The app should also provide the user with a set of recommendations on how to optimize streaming media in WebView. This should be done through the use of various machine learning-based algorithms that can detect any potential issues with the streaming media and provide the user with a set of solutions to improve the streaming experience.

Finally, the app should provide the user with an easy to use interface. This should be done through the use of intuitive navigation and a well-designed user interface. The app should also provide the user with detailed documentation on how to use the app, as well as a set of tutorials that will help the user get the most out of the app.

This project should be completed in a timely manner, while ensuring the highest quality of development. The final product should be highly reliable and user-friendly, while providing an accurate and efficient QoE evaluation of streaming media in WebView.

2.13 Project 13

Development of an Android SDK for Offline Map Services using OpenStreetMap and Server-Side Downloadable Maps

2.13.1 Project Description

The goal of this project is to develop an Android SDK that enables users to access and view offline maps using OpenStreetMap and server-side downloadable maps. The Android SDK

should be designed to be easy to use and integrate with existing mobile applications. The project should include the following tasks:

1. Research and familiarize yourself with OpenStreetMap and server-side downloadable maps.
2. Develop an Android SDK with the ability to access and view offline maps using OpenStreetMap and server-side downloadable maps.
3. Create an intuitive user interface for the SDK that allows users to easily access and view maps.
4. Develop a testing framework for the SDK and ensure it works on a variety of Android devices.
5. Optimize the SDK for performance and ensure that it works in low-bandwidth environments.
6. Document the SDK and provide an easy-to-follow tutorial on how to use and integrate it into existing mobile applications.
7. Publish the SDK and make it available to the public.

The project should be completed within a given timeline and should be tested thoroughly before it is released to the public. The developer should also provide ongoing support to users of the SDK and address any issues that may arise.

2.14 Project 14

Development of a Mobile Security Tool to Download and Analyze APKs from Google Play Using MobSF and REST API for Reporting

2.14.1 Project Description

This project is to develop a mobile security tool that will be used to download and analyze Android application packages (APKs) from Google Play. The tool will be based on the Mobile Security Framework (MobSF) and will use a Representational State Transfer (REST) API to generate reports of the analysis.

The first step in this project is to install the necessary software, including MobSF and any required libraries. The MobSF software will be used to perform static and dynamic analysis on the APKs. The REST API will be used to create and store the reports on the analysis.

Once the software is installed, the tool will be configured to download APKs from Google Play. The tool will need to be able to parse the metadata of the APKs, including the package name, version, target SDK version, and permissions.

The tool will then be used to perform static and dynamic analysis on the downloaded APKs. This will include decompiling the APKs, analyzing the code for any vulnerable points, and running the APKs in an emulator to observe the behavior of the application.

Once the analysis is complete, the tool will use the REST API to generate a report of the analysis. This report will include details such as the application's package name, target SDK version, permissions, and any vulnerabilities that were discovered.

2.15 Project 15

Create an Android app that is used to lock the mobile network on specific technology, band or frequency

2.15.1 Project Description

The goal of this project is to create an Android app that allows users to lock their mobile network on specific technology, band, or frequency. The app wil be designed to work with Android devices and must be user friendly.

The app will allow users to quickly and easily lock the mobile network on the communication channel of their choice. It will be designed to be intuitive and easy to use, so that users can quickly lock their mobile network with the technology, band, or frequency that best suits their needs.

The app will be designed with a graphical user interface (GUI) that will include several options for users to select from when locking their mobile network. The options will include technology (2G, 3G, 4G, 5G, etc.), band (700MHz, 850MHz, etc.), and frequency (1800MHz, 2100MHz, etc.). Once the user has selected the desired option, they will be able to lock the mobile network on that option with the click of a button.

The app will also include a tutorial section that will provide users with instructions on how to use the app and how to lock their mobile network on the desired option. This tutorial section will include screenshots and videos to make the app easier to use.

The app must be compatible with both rooted and non-rooted devices and must also be designed in accordance with the Android coding standards and guidelines, as well as the Google Play Store requirements. The app must be thoroughly tested and debugged before it is released to the public.

2.16 Project 16

Assessment and Comparison of Security in Popular Persian Social Network Apps: Server and Client Attack Analysis, and Recommendations for Improvement

2.16.1 Project Description

The goal of this project is to assess and compare the security of popular Persian social network apps. The project will focus on server and client attack analysis, and recommendations for improvement.

The project will begin by researching the most popular Persian social network apps and selecting a few to analyze. The research should include an overview of the architecture, technologies, and security measures used by each app.

Next, the project will involve a detailed security analysis of the server and client components of each app. This will involve analyzing the server and client code, attempting to identify vulnerabilities and attack points, and assessing the security of the app's data and communication.

The project will also involve identifying and analyzing existing attack scenarios, such as malware, phishing, and man-in-the-middle attacks. The project team should research and document the potential consequences of these attacks and analyze the potential impact on users and the app.

Following the security analysis, the project will involve developing recommendations for improvement. These recommendations should include changes to both the server and client components of the app, as well as general security best practices.

Finally, the project should include an evaluation of the recommendations to assess their effectiveness. This should include an analysis of the potential security risks, the costs of implementation, and the effectiveness of the proposed changes.

The project should also include a comparison of the security of the apps analyzed. This should include an overview of the security measures, vulnerabilities, and attack scenarios identified, as well as an assessment of the effectiveness of the security measures.

2.17 Project 17

Automated Quality of Experience (QoE) Evaluation of WhatsApp Web Application using Selenium and Server-Based Interaction Guidelines: Analysis of User Interactions and Generation of Test Reports

2.17.1 Project Description

This project involves automating the evaluation of the Quality of Experience (QoE) of the popular WhatsApp Web application using Selenium and server-based interaction guidelines. The overall goal is to analyze user interactions and generate test reports.

The project will start with a thorough review of the project requirements and objectives, and an analysis of the existing WhatsApp Web application. This includes researching the application's architecture, the technologies used, and any existing automated testing frameworks and tools.

The next step is to develop a Selenium-based automated testing framework to evaluate the QoE of the WhatsApp Web application. This includes developing the automated test scripts, designing the test scenarios, and configuring the test environment. The test scenarios should cover all aspects of the application's functionality, including performance, scalability, availability, and reliability.

The next step is to integrate the automated testing framework with server-based interaction guidelines. This will allow for the analysis of user interactions and the generation of test reports. The test reports should detail the application's performance, scalability, availability, and reliability.

The automated testing framework should be tested and evaluated to ensure that it meets all the project requirements and objectives. Once the automated testing framework is tested and verified, the project team should deploy it in the production environment and monitor its performance.

Finally, the project should end with a comprehensive post-deployment review. This review should include a comparison of the automated testing framework with manual testing, and a review of the test reports generated by the framework. The review should also include recommendations for improving the framework and any other aspects of the application.

2.18 Project 18

Kotlin Multiplatform Mobile (KMM) Device Data Collection: A Cross-Platform Solution for Android and iOS Devices across Different SDK Versions

2.18.1 Project Description

The goal of this project is to develop a cross-platform solution for Android and iOS devices to collect device data. The solution will be developed using Kotlin Multiplatform Mobile (KMM) and should be compatible with different SDK versions.

The project will involve the following tasks:

1. Researching the current Android and iOS device data collection solutions, to understand the limitations and the scope of the project.
2. Researching the available KMM libraries, to identify the best ones for the project.
3. Developing the KMM cross-platform device data collection solution.
4. Testing the solution on both Android and iOS devices, with different SDK versions.

5. Integrating the solution into existing Android and iOS applications.

The project should be implemented using the following steps:

1. The project team should create a project plan that outlines the tasks, resources, and timeline.
2. The team should research current Android and iOS device data collection solutions and the available KMM libraries.
3. The team should develop the KMM cross-platform device data collection solution, taking into account the requirements of different SDK versions.
4. The team should test the solution on both Android and iOS devices, with different SDK versions, to ensure compatibility and functionality.
5. Once the solution is tested and verified, the team should integrate the solution into existing Android and iOS applications.

At the end of the project, the team should deliver a comprehensive report that includes the project plan, documentation, testing results, and any other relevant information. This report should be used to evaluate the success of the project, and to identify any areas for improvement.

2.19 Project 19

Creating Interactive Indoor Maps with User Input and Sensor Data

2.19.1 Project Description

This project is to create interactive indoor maps that can be used by people in a building or complex. The interactive indoor maps will be developed using user input and sensor data to provide real-time information about the building or complex.

The project will involve the development of a user-friendly interface and integration of the user input and sensor data into the maps. This will enable users to interact with the maps and access real-time information about their environment. The user input and sensor data will include information such as room occupancy, temperature, and other environmental conditions.

The project team will need to develop the necessary software to support the interactive maps. This will include creating a user-friendly interface for users to interact with the maps, integrating the user input and sensor data into the maps, and creating an algorithm for the maps to update in real-time.

Once the software is developed, the project team will need to test the software to ensure that it is functioning properly and that it is able to handle user input and sensor data. The team will also need to create a user guide to explain how to use the interactive maps.

The interactive maps will be hosted on a web server and the project team will need to ensure the security of the data stored on the web server. This could involve the implementation of encryption and other security measures.

Finally, the team will need to create an app that users can download and use to access the interactive maps. This app will need to be optimized for mobile devices and tested for usability.

Once the project is completed, the team will need to continue to monitor the interactive maps to ensure they are functioning properly and provide feedback to users. This will involve collecting feedback from users and making improvements to the maps based on this feedback.

Overall, this project is a great opportunity to create interactive indoor maps that can be used by people to access real-time information about their environment. The project team will need to develop the necessary software, test the software, create a user guide, secure the data, create an app, and monitor the maps.

2.20 Project 20

Dynamic Sanctions Bypass Monitoring and Alerting System: Informing Iranian Users About Accessible Foreign Websites and Methods for Bypassing Oppressive Sanctions

2.20.1 Project Description

The goal of this project is to create a dynamic sanctions bypass monitoring and alerting system that informs Iranian users about accessible foreign websites and methods for bypassing oppressive sanctions. This system is intended to help Iranian citizens access information and resources that would otherwise be blocked due to oppressive sanctions.

The project will be divided into three main components: the development of the alerting system (including the development of a user interface and notification system), the monitoring of the foreign websites and methods of bypassing sanctions, and the analysis of the data collected from the monitoring.

For the development of the alerting system, the project team will need to develop a web-based user interface that allows users to sign up for alerts related to accessible foreign websites and methods for bypassing sanctions. The project team will also need to develop a notification system that sends out alerts when new content is posted or when changes are made to existing content.

For the monitoring of the foreign websites and methods of bypassing sanctions, the project team will need to develop a process for collecting and analyzing data from foreign websites and methods of bypassing sanctions. The project team will also need to develop a process for validating the accuracy of the data collected.

Finally, the project team will need to develop a process for analyzing the data collected from the monitoring. This process will include both qualitative and quantitative analysis of the data. The qualitative analysis will involve identifying trends in the data and developing recommendations for how to improve the system. The quantitative analysis will involve using statistical methods to evaluate the performance of the system and measure how successful it is in helping Iranian citizens access foreign websites and bypass oppressive sanctions.

Overall, this project will require the project team to develop a comprehensive system for informing Iranian users about accessible foreign websites and methods for bypassing oppressive sanctions. The project team will need to develop a user interface, notification system, monitoring process, and data analysis process in order to make this system effective.

3 Submission

The source code should be submitted to **GitHub**, and the **readme.md** should include the project name, project students, and some related information about how they did the project (technologies used and methods, researches, etc.).

4 Grading

The grading criteria for the project will be based on the quality of the source code, the readme.md, and the overall presentation of the project.

5 Deadline

The deadline for the project is March 6th, 2023.

6 Support

For any questions or concerns regarding the project, please contact **drdiyanat.courses@gmail.com**.