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| **Case\_No** | **Purpose** | **Steps** | **Data** | **Expected result** | **Actual result** | **Status** | **Test Environment** | **Note** |
| **TC01** | Check if the new user can register with a valid username and password | 1. Open the app and select the register button.  2. Enter a unique username and valid password in the corresponding fields.  3. Click the register button. | Username: testuser  Password: Test@123 | The user will receive a confirmation message that registration was successful and be redirected to the login page |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC02** | Check if the registered user can log in with a valid username and password. | 1. Open the application and select the login button.  2. Enter the registered username and password in the corresponding fields.  3. Press the login button. | Username: testuser  Password: Test@123 | Users will receive a welcome message and be redirected to the spend management page. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC03** | Check if users can add new expenses with a description, date, amount, and expense type. | 1. Log into the app and select the add spending button.  2. Enter the description, date, amount, and spending type for the new spending in the corresponding fields.  3. Click the save button. | Description: Buy books  Date: October 17, 2023  Amount: 100000 VND  Expenditure type: Study | The user will receive a confirmation that the spend was successfully added and see the new spend in the spend list |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC04** | Check if the user can edit an existing spend with a new description, date, amount, or type of spend. | 1. Log into the app and select the edit button next to the expenditure to be edited.  2. Change the description, date, amount, or spending type of the expenditure in the corresponding fields.  3. Press the button | Description: Buy discounted books  Date: No change  Amount: 80000 VND  Spending type: No change | The user will receive a confirmation that the spend has been successfully updated and will see the corrected spend in the spend list. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC05** | Check if users can set up monthly budgets for different types of spending. | 1. Log into the app and select the budget setup button.  2. Enter the desired amount for different spending types in the corresponding fields.  3. Tap the save button. | Budget for food: 1.000.000 VND  Budget for entertainment: 500.000 VND  Budget for studying: 800.000 VND  Budget for other expenses: 300.000 VND | Users will receive confirmation that the budget has been successfully set up and see budget amounts for spend types in the spend management page. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC06** | Check if users can adjust budget amounts for spending categories as needed. | 1. Log into the application and select the budget setup button.  2. Change the desired amount for one or more spending categories in the corresponding fields.  4. Click the save button. | Food budget: No change  Entertainment budget: 600.000 VND.  Study budget: No change  Budget for other types of expenses: No change | Users will receive confirmation that the budget has been successfully updated and see the new budget amounts for spend types in the spend management page. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC07** | Check if the app provides an overview of monthly spending, including total spending, remaining budget amount, and percentage spent by type. | 1.Log into the application and select the overview button  2. View information about monthly spending on the screen. | Total spending amount: 1.800.000 VND  Remaining budget amount: 1.200.000 VND  Percentage of spending by type:  Food and drink: 50% Entertainment: 40%  Study: 10%  Other types: 0% | Users will see information about monthly spending displayed clearly and accurately on the screen. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC08** | Check if users can see spending trends over time. | 1. Log into the app and select the trend view button.<br>- Select the desired time period to view spending trends (e.g. week, month, year).  2. View a graph of trends spent on screen. | Time period: Month  Spending trend:  January: 1.500.000 VND  February: 1.700.000 VND  March: 2.000.000 VND  April: 1.800.000 VND  May: 1.900.000 VND  June: 2.100.000 VND  July: 1.600.000 VND  August: 1.800.000 VND  September: 2.000.000 VND  October: 1.900.000 VND | Users will see a graph of monthly spending trends displayed clearly and accurately on the screen. The chart will have two axes: spending amount (VND) and time (month). The chart will have a line connecting the points representing each month's spending. The chart will have appropriate colors and legends. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC09** | Test if users can add recurring expenses (for example, monthly rent) with start and end dates | 1. Log into the app and select the add recurring spend button.  2. Enter the description, start date, end date, amount, and spend type for the recurring spend in the corresponding fields.  3. Press the save button. | Description: House rent  Start date: January 1, 2023  End date: December 31, 2023  Amount: 1000000 VND  Expenditure type: Housing | The user will receive a confirmation that the recurring spend was successfully added and see the recurring spend in the spend list. Recurring spends will be automatically added to the user's monthly budget for the months within the selected time period. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC10** | Check if users can generate detailed spending reports for specific periods (e.g., monthly or yearly). | 1. Log into the application and select the Create Report button.  2. Select the desired time period to create an expense report (for example, from January 1, 2023 to March 31, 2023).  3. Click the Create Report button. | Time period: From January 1, 2023 to March 31, 2023  Spending during the period:  Total spending amount: 5.200.000 VND  Percentage of spending by type:  Food and drink: 40% Entertainment: 20%  Study: 30%  Housing: 10%  Other types: 0% | Users will receive detailed reports on spending for the selected time period. The report will include the total amount spent, the percentage spent by type, and a pie chart showing the percentage spent by type. The report will have appropriate colors and captions. Users can save reports as PDF files or share reports via email or social networks. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |
| **TC11** | Check if the app sends reminders or notifications when users approach or exceed budget limits for specific spending types. | 1. Log into the app and set up budgets for different spending types.  2. Add new expenses for different spending types so that the total amount spent for a certain spending type is equal to or greater than 80% of the budget for that type of spend.  3. Check to see if you receive reminders or notifications from the app | Budget for all types of expenses:  Food: 1.000.000 VND  Entertainment: 500.000 VND  Study: 800.000 VND  Housing: 1.000.000 VND.  Other other: 300.000 VND.  New spending:  Food and drink: 800.000 VND  Entertainment: 400,000 VND  Study: 700,000 VND  Housing: None  Other types: None | Users will receive reminders or notifications from the application when the total amount of a certain spending type is equal to or greater than 80% of the budget for that spending type. The reminder or notification will display the spend amount, budget amount, and percentage spent for that spend type. Reminders or notifications will have appropriate colors and sounds. Users can choose to view details or ignore reminders or notifications. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection. |  |

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| **Case\_no** | **NFR** | **Criteria** | **Scenario** | **Data** | **Expected result** | **Actual resul** | **Status** | **Test Environment** | **Note** |
| **TC\_01** | Performance | The app should provide a smooth and responsive user experience, even with a large amount of expensive data | Load the app with 1000 expense records. | A database file with 1000 expense records. | The app should load within 5 seconds and display the expense data without any lag or delay. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_02** | User-Friendly Interface | The user interface should be intuitive, with clear labels and easy navigation for effortless expense tracking | Navigate through the app's main features. | None | The app should have a clear and consistent layout, with labels and icons that indicate the functionality of each feature. The app should also have a navigation menu or toolbar that allows the user to switch between different screens easily. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_03** | Platform Compatibility | The app should be developed for both Android and iOS platforms to reach a wider user base. | Install and run the app on different devices and operating systems. | The app's installation file for Android and iOS | The app should be compatible with various devices and operating systems, such as Android 8.0 or higher, iOS 12.0 or higher, tablets, smartphones, etc. The app should also adapt to different screen sizes and orientations without affecting the user interface or functionality. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_04** | Data Security | User data, including expenses and budget information, should be securely stored and protected with encryption. Data privacy practices should be followed to ensure user information is kept confidential. | Check the security and privacy of user data in the app and the database. | A database file with some expense records and budget information. A security testing tool such as Nmap or Burp Suite. A privacy policy document for the app. | The app should encrypt the user data before storing it in the database or sending it over the network. The app should also have a password protection feature to prevent unauthorized access to the user data. The app should also follow the data privacy practices outlined in the privacy policy document, such as not sharing or selling user data to third parties, allowing users to delete their data upon request, etc. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_05** | Feedback and Support | Include a feedback form within the app for users to report issues or provide suggestions.BudgetWise Solutions should actively monitor user feedback and address issues promptly. | Submit a feedback form through the app. | A feedback form with some issues or suggestions. | The app should allow the user to submit a feedback form through the app, with fields such as name, email, rating, comment, etc. The app should also send a confirmation message to the user after submitting the feedback form. BudgetWise Solutions should receive the feedback form and respond to the user within 24 hours. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_06** | Monetization (Optional) | Monetization features, such as in-app ads or premium features, can be explored in future updates. Initial development should prioritize core expense management functionality. | Check the presence and functionality of monetization features in the app. | None | The app should not have any monetization features in the initial development, such as in-app ads or premium features. The app should focus on providing core expense management functionality to the user. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_07** | Usability | The app should be easy to use and learn, with a user-friendly interface and clear instructions. | Perform a usability test with a sample of potential users | A usability test script with tasks and questions for the users. A usability test tool such as UserTesting or Lookback. | The app should have a high usability score, based on metrics such as task completion rate, time on task, user satisfaction, user errors, etc. The app should also receive positive feedback from the users on aspects such as navigation, layout, design, functionality, etc. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC\_08** | Reliability | The app should be reliable and stable, with minimal bugs and errors. The app should also handle unexpected situations gracefully and recover from failures quickly. | Perform a reliability test with various scenarios and inputs. | A reliability test plan with scenarios and inputs that may cause failures or errors in the app. A reliability test tool such as Appium or Robotium. | The app should have a high reliability score, based on metrics such as mean time between failures (MTBF), mean time to repair (MTTR), failure rate, etc. The app should also handle unexpected situations gracefully and recover from failures quickly, without losing data or functionality. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |
| **TC09** | Scalability | The app should be scalable and able to handle increasing amounts of data and users without compromising performance or functionality. | Perform a scalability test with various loads and volumes of data and users. | A scalability test plan with loads and volumes of data and users that may affect the performance or functionality of the app. A scalability test tool such as JMeter or LoadRunner. | The app should have a high scalability score, based on metrics such as response time, throughput, resource utilization, etc. The app should also maintain its performance and functionality under increasing loads and volumes of data and users, without crashing or slowing down. |  | Pass  or  Fail | Android 10, Samsung Galaxy S10, Wi-Fi connection | None |