

Test Report

As a result, 10 people participated in the beta testing (not including the QA team). The feedback received in the form of surveys is presented below:

id	Tester's email*	Device model	OS version	Screen resolution	RAM size	functionality realization (from 0 to 10)**	Did you see all the features you expected?	Detected bugs (id)	Comment
1	-	Huawei P20 Lite ANE-LX1	9	2280x1080	4 GB	10/10	Yes	1	For an average calculator, excellent functionality and a pleasant design. In future releases, I would like to see the engineering (scientific) calculator features.
2	Saveq1@mail.ru	Huawei Y9 2019	9	2340x1080	4 GB	8/10	Yes	2	There is no horizontal orientation in the app.
3	elena.pavlo99@gmail.com	Realme RMX3491	11	2412x1080	4 GB	8/10	Yes	1, 3	It would be cool if an engineering calculator would appear when you go to the horizontal position.
4	jagan1202174@gmail.com	Xiaomi Redmi 10	11	2400x1080	4 GB	9/10	Yes	4, 5	I want to see the existing functionality developed to perfection. There is also a suggestion to change the result field. In my opinion, it should not take up so much size on the screen.
5	-	Xiaomi Redmi Note 8T	9	2340x1080	4 GB	7/10	Yes	-	I want to see increased functionality in future updates.
6	-	Huawei P Smart	8	2160x1080	4 GB	0/10	-	1	The equals button is missing.
7	Shvedah@gmail.com	Honor 20	10	2340x1080	6 GB	9/10	Yes	1	Part of the interface does not fit on the screen, but this does not influence to functionality. The button to delete one symbol can be replaced by a more presentable one. I would like to be able to work further with the result of the calculation. It was nice to see the developer's greeting in the belarusian language.
8	-	Honor 50	11	2340x1080	8 GB	8/10	Yes	1, 5, 7	Incorrect display, most of the bottom row buttons are "eaten" by the navigation buttons. When using gestures the situation is better, but part of it is still cut off. If you don't close the bracket, an error appears. When you enter a large expression, the third row of numbers is cut in half, and what is next - is not visible in principle. If you use the application for single counts, everything is fine. What's missing is the ability to further manipulate with the result. I would also like to have a cursor, to correct an error in the middle of an expression. In the future I would like to add an engineering mode.
9	pavlyut.pavel@bk.ru	Samsung Galaxy A71	9	2400x1080	6 GB	9/10	Yes	-	I would like to see changes in the design (particularly changes in the result field). Also it would be nice, if I able to work further with the result of the calculation.
10	-	Honor 20	9	2340x1080	6 GB	0/10	-	1	The bottom row of buttons doesn't fit in the screen area. It's impossible to use the application.

Table 1 – Survey results (*Note: some participants wished to stay anonymous, so their email address is not shown).

It is also important to note that grade of user which were unable to use the application for some reasons automatically scored a "0".

At the same time as the focus group was exploring the application, the QA team was conducting exploratory testing. After receiving the surveys, the bug report generation phase began. The results are presented in the table below:

id	Summary	Discription	Steps to reproduce	Priority	Severity	Status	Reprodu- cibility	Symptom	Work- around	Attachment	Comment
1	Part of the UI doesn't fit in the screen when the app is running	On a number of devices, the side and bottom rows of buttons don't fit into the screen. Expected result: UI is displayed correctly Actual result: UI is displayed incorrectly	1. Run the app in any device: Huawei Y9 2019 / Honor 20 / Honor 50	ASAP	Blocker	New	Always	Incorrect behavior	No	Honor 20: https://ibb.co/VTB34LW Huawei P20: https://ibb.co/iy84KTc Realme RMX3491 https://ibb.co/hWdkij4	
2	UI has incorrect when moving to the horizontal orientation	Most of the interface becomes invisible and unavailable in horizontal orientation. Expected result: UI is displayed correctly Actual result: UI is displayed incorrectly	1. Run the app	ASAP	Blocker	New	Always	Incorrect behavior	No	Huawei Y9: https://ibb.co/tHBgGsd	
3	The welcome window appears every time when device changes orientation	Every time when orientation is changes, a appears window with a welcome message from the creator on main screen. Expected result: dialog appears once Actual result: dialog appears after every change of orientation	1. Run the app in vertical orientation 2. Change orientation to horizontal 3. Change orientation back to vertical	Medium	Low	New	Always	Incorrect behavior	No	Realme RMX3491: https://ibb.co/dbzWC9x	
4	The result of the previous calculation in work field displays incorrectly	The result of the previous calculation in the work field is not a single number, but the previous whole expression. Expected result: previous result looks as single number Actual result: previous result looks as previous expression	1. Run the app 2. Enter "2+3" 3. Push equal 4. Push equal 5. Push "+7"	Low	Low	New	Always	Incorrect behavior	No	—	
5	The third line of the expression doesn't appear completely in the work field during calculation	Incorrect display of an expression which take 3 lines of text. Expected result: whole expression is visible Actual result: incorrect work	1. Run the app 2. Enter expression which takes 3 text lines	High	Medium	New	Always	Cosmetic defect	No	Honor 50: https://ibb.co/CW168x6	
6	Ability to enter two characters in a row in expression while writing	The user has the ability to enter two or more characters in a row. Expected result: symbols must be interchangeable Actual result: ability to enter two characters in a row	1. Run the app 2. Enter "-/"	Medium	Low	New	Always	Incorrect behavior	No	Google Pixel 4: https://ibb.co/6shwVd5	It should be stressed that the ability to enter two characters in a row "-" or "-+" or "+-" is the author's plan and isn't a bug.
7	If the user does not close parentheses, the expression is not calculating	If the user does not close brackets, the expression is not calculating. Expected result: brackets automatically close Actual result: "error in expression" message appears	1. Run the app 2. Enter "8+(6+5" 3. Push "equal"	Medium	Low	New	Always	Incorrect behavior	No	Honor 50: https://ibb.co/J7w8fhS	

Table 2 – Bug reports

Bug #2, which was detected by users will not be taken into account in further conclusions. The reason for this is that this bug belongs to the area of unrealized functionality.

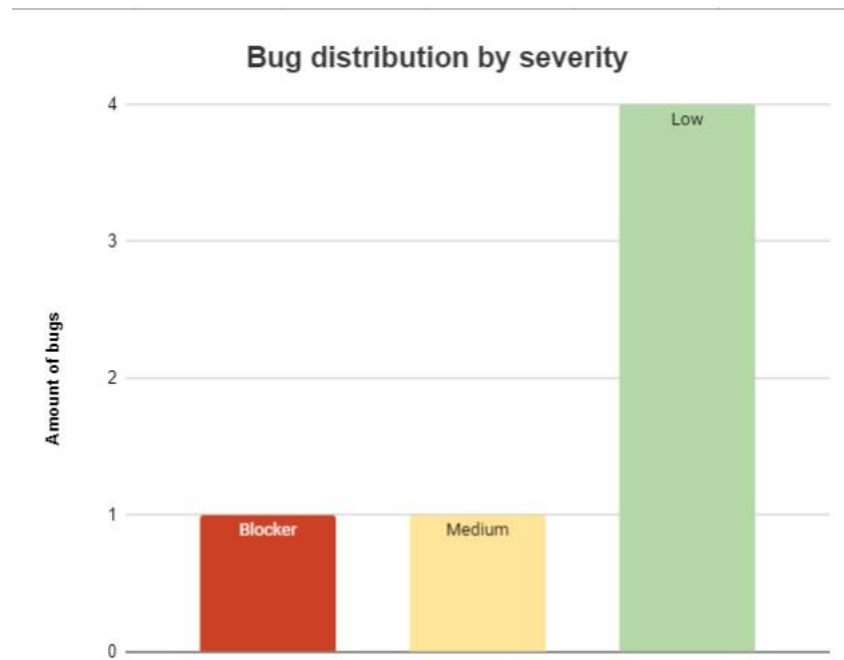


Diagram 1 - The distribution of bugs by severity

We can see that there are 6 bugs in our application, 1 of which prevented 2 users from using the application and 5 users had discomfort during using. We can say that 70% of the users had to deal with this bug. This obliges the developer to solve this problem obligatorily.

A suggestion was received from 4 users to extend the functionality of the calculator to an engineering calculator. Also, 4 users suggested changes to the design of the application. The development team should pay attention to these problems.

We need to pay attention to the following fact: some users claimed that the application lacks the ability to work with the result of a previous calculation. However, this functionality is implemented by repeatedly pressing "=". This fact indicates that the application needs to work on the UX.

To summarize, we can say that the realization of the application is at a satisfactory level. There is one serious blocker defect that needs to be fixed immediately. The rest of the bugs are not that critical. The program logic hasn't conflicts, crash system hasn't been found by testers, which says that the basis of the program is designed and implemented satisfactorily.

(Link to tables:

https://docs.google.com/spreadsheets/d/1VSD_b6Uh64wE7WcN2MDxJd0Ei_I0zmPSy_2R6wDvE9w/edit?usp=sharing)

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