

RANCANG BANGUN KALKULATOR BARISAN DAN DERET DENGAN METODE KANBAN

Emil Herdiana^{*1}, Buhori Muslim²

^{1,2} Informatics Engineering, Faculty of Engineering, Universitas Putra Indonesia

Email: ¹Emilherdiana69@gmail.com, ²buhoristp@gmail.com,

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Abstract

The lack of students' understanding of the material for sequences and series often results in confusion about how to work on sequence and series questions. In addition, students are also sometimes not careful in calculating sequences and series questions. To overcome these problems, the authors designed an Android-based application that can perform calculations and work on sequence and series problems, including how to solve them. As well as in this application, learning materials for sequences and series are available which are useful for increasing students' understanding of sequences and series. In this study, the authors collected problem data through observation, interviews, and questionnaires. The system design method that the author uses in this study is the kanban method, by dividing each step of the process into three parts, namely the requirements, develop, and test sections. To design the author's system using the UML (Unified Modeling Language) modeling tool and to create the interface design the author uses a wireframe. Meanwhile, to implement the author system using the Android Studio software. In system testing, the authors tested the system through two stages of testing, namely internal testing and external testing. Internal testing was carried out by the author himself using the black-box testing method. Meanwhile, external testing was carried out by students and mathematics teachers.

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Corresponding Author:

Emil Herdiana

Informatics Engineering, Faculty of Engineering, Universitas Putra Indonesia

Email: Emilherdiana69@gmail.com

1. INTRODUCTION

Mathematics is a science that has an important role in education. Because basically mathematics is a basic science in various fields of science.

One of the branches of mathematics that has an important role in education is rows and rows. One of its roles is to test students' basic abilities when they proceed to a higher level of education. It is usually found in the intelligence question (IQ) test, general ability test (TKU), or academic potential test (TPA). Lack of understanding of row and series material often results in mistakes in the way of working on row and series problems. In addition, students are also sometimes less thorough in calculating row and row questions.

To overcome the above problems, an application is needed that can calculate and work on row and series problems, including how to solve them. In addition, the application must also contain rows and rows learning materials in order to increase students' understanding of rows and rows.

2. METHOD

The system design method used by the author in this study is the Kanban method. By dividing each step of the work into three parts, namely the requirement, develop, and testing sections. And each part is divided into three stages, namely todo, in progress, and done.



Figure 2.1 Kanban Method Workflow

The explanation for each part of the Kanban method that the author uses is as follows:

1. Requirement

At the requirement stage, the author collects the data needed to develop the system, then analyzes the data, and finally makes a system design and interface design based on the results of the analysis.

2. Develop

In the develop stage, the author implements a system based on the design that has been made at the requirement stage. It starts with implementing the interface design all the way to the logical part.

3. Testing

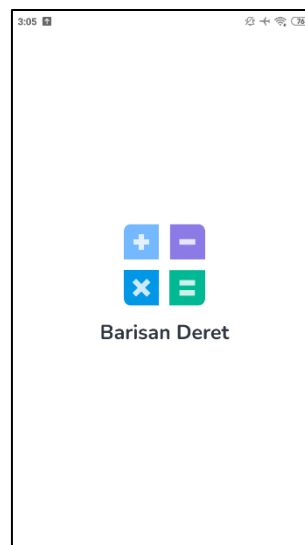
Once the system is implemented, it then goes into the testing stage. System testing is carried out through two stages of testing, namely internal testing and external testing. Internal testing was carried out by the author himself to find out whether the built system could run properly or not. Meanwhile, external testing is carried out by students and mathematics teachers to find out whether the system built is acceptable or not, especially for students

3. RESULTS AND DISCUSSION

The author runs a row and row calculator application on the Xiaomi Redmi 5A smartphone. The screenshots of the row and series calculator app are as follows:

1. Splash Screen Page

A splash screen page is the page that appears first when the app is launched. This page aims to display the logo and name of the app before the main page is displayed. Here is a screenshot of the splash screen page:



Gambar 3.1 Halaman Splash Screen

2. Calculator Menu Page

The calculator menu page is a page that contains the calculator menu of arithmetic rows, geometric rows, arithmetic rows, and geometric rows, and there is a navigation menu to move to the material menu page. Here's a screenshot of the calculator's menu page:



Figure 3.2 Calculator Menu Page

3. Calculator Page

A calculator page is a page that is used to input the numbers and syllables according to the selected calculator. Here is a screenshot of the calculator page:

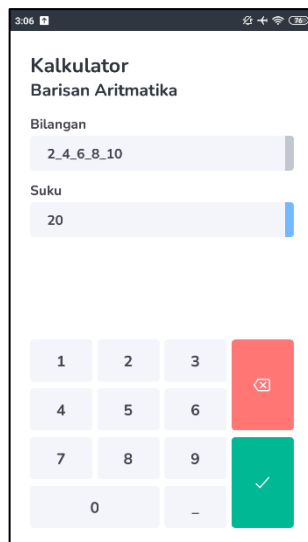


Figure 3.3 Calculator Page

4. Results Page

The results page is a page that is used to display the calculation results of the input that has been given. Here is a screenshot of the results page:

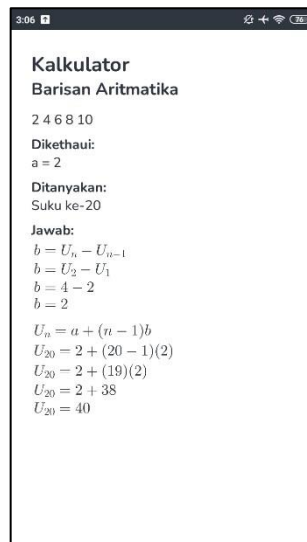


Figure 3.4 Results Page

5. Material Menu Page

The material menu page is a page that contains the material menu of arithmetic rows, geometry rows, arithmetic rows, and geometric rows, and there is a navigation menu to move to the calculator menu page. Here is a screenshot of the material menu page:



Figure 3.5 Material Menu Page

6. Material Page

Material pages are pages that are used to display learning materials according to the selected material menu. Here is a screenshot of the material page:

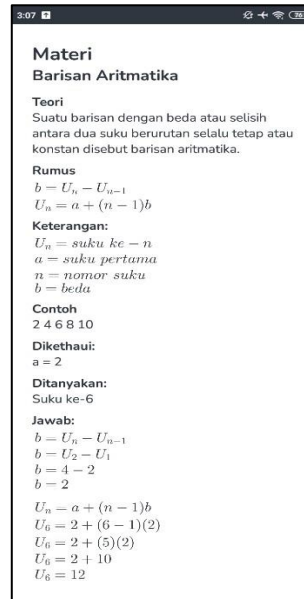


Figure 3.6 Material Pages

3.1 Testing

The testing steps are as follows:

1. This test was first conducted by guiding students and math teachers on how to use the app. Starting by introducing the menus in the application to doing the calculation examples.
2. Then the test is carried out by giving practice questions to students, with questions that have been prepared in advance by the mathematics teacher. Here students will explore the use of the application.
3. After the practice questions are completed, students are asked to provide feedback on the application by filling out a questionnaire.

The questionnaire was filled out by 30 students consisting of class X and class XI. The results of filling out the questionnaire are as follows:

Table 1. Results of Filling in the Questionnaire

No	Questions	STS	TS	N	S	SS
1	Does the row and series calculator app have Good look?	0	1	7	16	6
2	What are the menus in the row calculator application and Easy-to-understand rows?	0	0	5	17	8
3	What is the application of simple row and series calculator digunakan?	0	0	1	18	11
4	With the row and row calculator application, you can find out the formula used to work on row and row problems Right?	0	0	2	11	17

5	With the existence of an application	0	1	8	16	5
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In Table 1, the questionnaire is measured on a Likert scale. Where STS (Strongly Disagree) is worth 1, TS (Disagree) is worth 2, N (Neutral) is worth 3, S (Agree) is worth 4, and SS (Strongly Agree) is worth 5.

To obtain the total score of each question is calculated by the formula: T (Number of respondents who voted) \times Pn (Choice of likert score). Meanwhile, to calculate the average statement of agreement of each question is calculated with the formula: $\text{total score} / \text{highest total score} \times 100\%$. The score and average scores of the questionnaire results are as follows:

Table 2. Score Scores and Average Questions

No	Questions	Total Score	Ave
1	Does the row and row calculator app have a good look?	SS: $6 \times 5 = 30$ S: $16 \times 4 = 64$ N: $7 \times 3 = 21$ TS: $1 \times 2 = 2$ Total score: 117	$117 / 150 \times 100\% = 78\%$
2	What are the menus in the app	SS: $8 \times 5 = 40$ S: $17 \times 4 = 68$	$123 / 150 \times 100\% = 82\%$

To find out whether or not the results of the overall average question have a value in favor of the application being built. The author made the measurement scale as follows:

Table 3. Measurement Scale

Value Range	Category
0-20%	Strongly Disagree
21-40%	Disagree
41-60%	Neutral
61-80%	Setuju
81-100%	Strongly agree

The overall average result of the questionnaire question received a score of 82.95%. Based on the measurement scale in Table 3, the row and series calculator application received a result of "Strongly Agree" with a value range of 81-100%.

4. CONCLUSION

Based on the research that the author has conducted at MA Musa'adatul Ikhwan regarding "Design and Build Row and Row Calculators with the Kanban Method", the author can draw the following conclusions:

1. With the application of row and series calculators, students are helped in overcoming the problem of mistakes in how to work on row and series problems.
2. With the application of row and series calculators, students are helped in overcoming the problem of accuracy in calculating row and series problems.

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