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Prediction of Student Acceptance Based on Android

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Abstract. State universities are the hope of most students who want to continue their education to a higher level after high school / equivalent. To enter college, students must take the selection test held by the desired university. For state universities the selection test is held simultaneously and simultaneously called the SBMPTN (Joint Selection to Enter State Universities). This selection is carried out nationally and the participants are all students who want to get the opportunity to enter a state university. To get results that are as expected, the participants must make some preparations including the Try Out. By doing SBMPTN Try Out, it is expected that participants can compete with other participants and can graduate according to their choice. Try Out can be done at the place of tutoring that holds it or by buying a book containing Try Out questions. Along with the development of Smartphone technology, a prediction system will be created from the results of an Android-based SBMPTN Try Out that will provide information on study programs and universities that are likely to receive. SBMPTN participant candidates can practice questions anywhere and anytime. The method that will be used is the Fisher-Yates Shuffle, which functions to scramble the questions.

Keywords—Android, *Fisher-Yates Shuffle,* SBMPTN, Try Out

Introduction

Higher education is one of the formal education units that is at the highest level after high school / equivalent. The choice of a place of formal education is very important for students, especially after graduating from high school / equivalent towards a higher level. Most of the students who graduated from high school / equivalent tend to choose the national high school. However, the capacity of public universities is very limited, which makes all students who register cannot enter all. Therefore prospective students must attend the student admission selection called the SBMPTN [1]. Seeing the intense competition and the limited opportunity to enter public universities, prospective students must make some preparations, such as choosing the desired department, understanding the rules and assessment, practicing the questions tested and taking the Try Out [2]. To prepare for this can be obtained at the place of tutoring, but this is still costly and ineffective, because students must come to

the place with the time determined by the bimbel organizer. The development of Smartphone technology is increasingly rapid [3], It is necessary to do SBMPTN Try Out to predict the acceptance of new students based on Android to find out the opportunities for expected tertiary education [4].

Methodology

Figure 1 The system architecture of this Android-based SBMPTN Try Out prediction is Client-Server [5]. Where the client is a terminal used by the user to request certain services that are needed and also used to receive the results of processing requested from the server [6]. While the server is the party that provides server services can be a SQL database. The description of the system architecture can be seen as shown in figure 1 below [7]

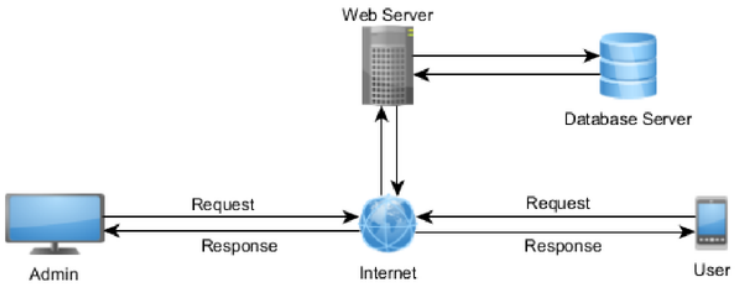

Figure 1 System Architecture

Figure 2 is an application Flowchart of Android-based SBMPTN Try Out predictions. system architecture image above

- Admin: sends a request in the form of input and updates the question data, answers, answer keys, and lists that pass the database server to grade, then the admin will receive a response from the database server [8].
- User: sends a request consisting of input data and answers to questions obtained from the database server, then the user will receive a response in the form of a score obtained from the questions that have been answered on the database server [9].
- Internet: work on bridges between users / admin and web servers in order to store data into database servers and receive data from database servers.
- Web Server: trying to provide data request (request) services in the form of text, images, etc. from the user and provide a response (appreciated) at the request of the user through a predetermined communication protocol [10].
- Database Server: done as a place to store data needed by admin and users.

In addition to the application and admin flowchart, there is also a system flowchart from the SBMPTN Try Out application. Figure 3 is the flowchart system [6].In addition to the application flowchart, admin flowchart, and system flowchart there is also a flowchart algorithm used in the SBMPTN Try Out application. Figure 4 is the flowchart of the fisher yates-shuffle algorithm.

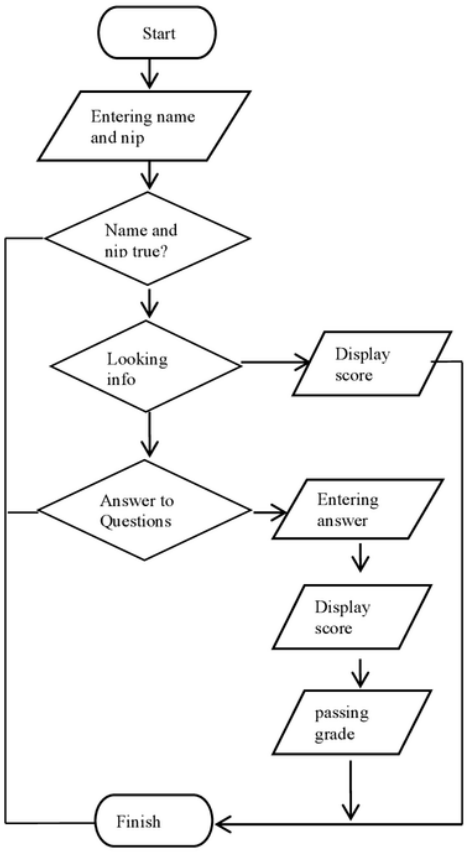

Figure 2 Application Flowchart

The Fisher-Yates algorithm is chosen because this algorithm is a better randomization method or can be said to be suitable for numerical randomization, with fast execution time and does not require a long time to perform a randomization [11]. The Fisher-Yates algorithm consists of two methods, namely, the original method and the modern method [12]. But in the development of this application this algorithm is applied using modern methods.

Modern methods are chosen because this method is specifically used for randomization with computerized systems, because the results of randomization can be more varied [13].

Next is the basic method used to generate a random permutation for numbers 1 to N as follows:

1. Write a number from 1 to N.
2. Select a random number K between 1 and the number of numbers that have not been crossed.
3. Calculated from the bottom, cross the number K that has not been crossed, and write the number in another place.
4. Repeat step 2 and step 3 until all the numbers have been crossed.
5. The sequence of numbers written in step 3 is a random permutation from the initial number. In the modern version used now, the selected number is not crossed, but the position is exchanged with the last digit of the number that has not been selected. The following is a formula from the Fisher Yates Shuffle algorithm [14].

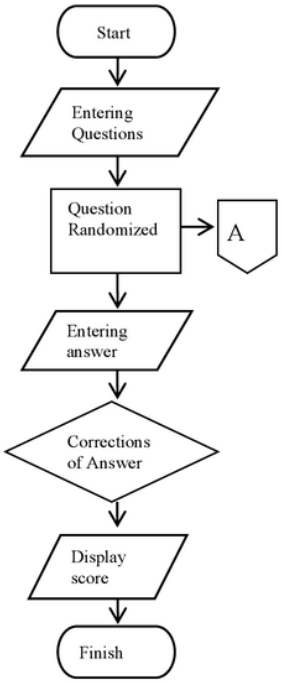

Figure 3 Flowchart system

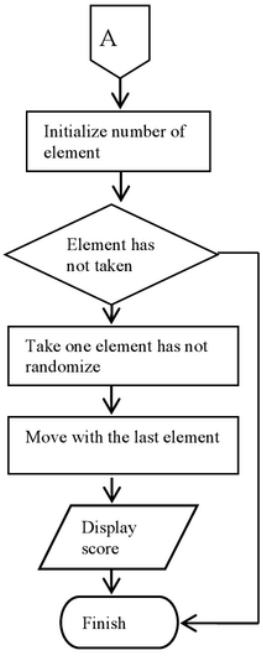

Figure 4 Flowchart of Fisher Yates Shuffle Algorithm

```
To initialize an array a of n elements to a
randomly shuffled copy of source, both 0-based:
  for i from 0 to n − 1 do
      j ← random integer such that 0 ≤ j ≤ i
      if j ≠ i
          a[i] ← a[j]
      a[j] ← source[i]
```

Randomization is very important in making many applications. Although it looks easy, but basically if it's not done well, randomization can have a bad impact on an application [15]. For this reason, a good algorithm is needed, especially in terms of randomization [16]. In this case randomization uses the Fisher-Yate algorithm [17]. This algorithm is an optimal way with efficient execution time, and with a memory space that is not too large [18].

Table 1 Fisher Yates Shuffle Algorithm

Range	***Roll***	***Scratch***	***Result***
		1 2 3 4 5 6 7 8	
1-8	5	1 2 3 4 8 6 7	5
1-7	3	1 2 7 4 8 6	3 5
1-6	4	1 2 7 6 8	4 3 5
1-5	5	1 2 7 6	8 4 3 5
1-4	2	1 6 7	2 8 4 3 5
1-3	3	1 6	7 2 8 4 3 5
1-2	1	6	1 7 2 8 4 3 5

The permutation obtained is 6 1 7 2 8 4 3 5.

The following are examples of workmanship from the modern version [19]. Range is the number of numbers that have not been selected, roll is a random number selected, scratch is a list of numbers that have not been selected, and the result is the result of the permutation that will be obtained [20].

Display of Data Grade Pages

The grade admin data page can see the entered data. On the page there are grade codes, study program names, campus names, and grade grades from each study program. Figure 5 below is a display of the data grade page.

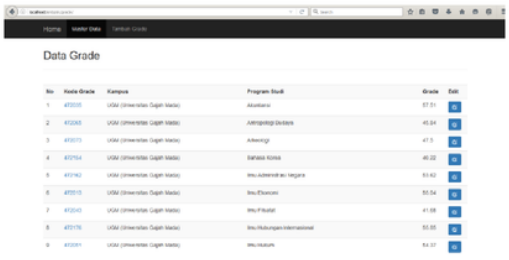

Figure 5 Display of Data Grade Pages

Score Data Display page

On the value page contains the value of students who have tried out. In the page it is known how many correct questions, wrong questions, unanswered questions, scores obtained and passing grade. Figure 6 below is a display of the score page.

Figure 6 Display page score

Results and Discussion

In Fisher Yates-Shuffle, first arraylist a is filled with values 1-10. Fill in 10 so that the results of the trial are more visible. The first loop is randomized and then saved to the arraylist temp. before the value of the randomization is entered, a random number check is entered into the arraylist. This is done to ensure that the arraylist contains unique numbers. Then the value that has been taken is exchanged for the position with the last arraylist. But the value that has been taken cannot be taken back, so the data that comes out will not be the same.

The Fisher Yates-Shuffle algorithm can randomize correctly. Repetition is done as much as existing data and data that has been taken will not be retrieved. For more details, see Table 2 below.

Table 2 Figure randomization with the Fisher Yates-Shuffle

Take Data	Return Data	Start Data Dishuffle	After Data Dishuffle
7	9	0,1,2,3,4,5,6,7,8,9	0,1,2,3,4,5,6,9,8,7
2	7	0,1,2,3,4,5,6,9,8,7	0,1,7,3,4,5,6,9,8,2
4	2	0,1,7,3,4,5,6,9,8,2	0,1,7,3,2,5,6,9,8,4
0	4	0,1,7,3,2,5,6,9,8,4	4,1,7,3,2,5,6,9,8,0
5	0	4,1,7,3,2,5,6,9,8,0	4,1,7,3,2,0,6,9,8,5
8	5	4,1,7,3,2,0,6,9,8,5	4,1,7,3,2,0,6,9,5,8
1	8	4,1,7,3,2,0,6,9,5,8	4,8,7,3,2,0,6,9,5,1
6	1	4,8,7,3,2,0,6,9,5,1	4,8,7,3,2,0,1,9,5,6
3	6	4,8,7,3,2,0,1,9,5,6	4,8,7,6,2,0,1,9,5,3
9	3	4,8,7,6,2,0,1,9,5,3	4,8,7,6,2,0,1,3,5,9
Result of Random			4,8,7,6,2,0,1,3,5,9

Conclusions

Based on the previous explanation, conclusions can be taken as follows:

1. This prediction system provides information on opportunities to be accepted into study programs and universities according to the try-out passing grade
2. The results of the trial with 20 users and 180 questions that are run simultaneously, there is no one same question at the same time. Thus the Fisher-Yates Shuffle algorithm is effective for scrambling questions so that each user who runs the application will get different questions at the same time.

Aknowledgment

Furthermore, the application of predictive system development using Try Out for SBMPTN is to follow the development of passing grades for each study program and university and Try Out questions.

References

[1] Team Widya Gamma and T. Quantum, *Consolidation of Facing the 5-Year Edition of IPC SBM-PTN*. Bandung: Yrama Widya, 2014.

[2] Munawar, *Visual Modeling with UML*. Yogyakarta: Graha Ilmu, 2005.

[3] N. S. H, *Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android*. Bandung: Informatika, 2012.

[4] P. F, *Android Programming for Beginners*. Jakarta: Opening of Horizon, 2011.

[5] N. Ajit Kumar, K.T. Hari Krishna, and P. M. R, "Challenges and Best Practices in Mobile Application Development," *Imperial Journal of Interdisciplinary Research (IJIR),* vol. 2, no. 12, 2016.

[6] C. Rides, *Android Programming with Eclips*. Yogyakarta: ANDI, 2013.

[7] y. Setiawan, *Database Client Server Using Internet Base*. Yogyakarta ANDI, 2004.

[8] Chawla Dimple, Aggarwal Rahul, and A. Akansha, "Scientific Research and Development of Mobile Application for Android Platform.," *IITM Journal of Management and IT,* vol. 7, no. 1, pp. 125 - 131, 2016.

[9] Supriyanto, *Application of Algorithm Fisher-Yates on Edugame Guess Caculation Based on Android*. Palembang: Informatics Study Program, 2014.

[10] Fandi Ahmad Rizal, Budi SUyanto, and T. R. Yudantoro, "Educational Game Application Mathematics with the Concept of Android-Based Children's Arithmetic " *Journal of Applied Electrical Engineering Semarang State Polytechnic,* 2016.

[11] P. Black, *Fisher–Yates shuffle*. Dictionary of Algorithms and Data Structures. : National Institute of Standards and Technology, 2005.

[12] Imam Haditama, Cepy Slamet, and D. F. Rahman, "IMPLEMENTASI ALGORITMA FISHER-YATES DAN FUZZY TSUKAMOTO DALAM GAME KUIS TEBAK NADA SUNDA BERBASIS ANDROID," 2016.

[13] R. Nugraha, *Application of the Fisher-Yates Algorithm in the Lost Insect Application for the Introduction of Unity-Based 3D Insect Types*. Palembang: Informatics Study Program, 2015.

[14] Fan Wu, Dwayne Clarke, Jian Jiang, Asif Baba, and S. Buford, "The Digital Age of Campus Maps on Mobile Devices," *Journal of Computer and Communications,* vol. 4, 2016.

[15] U.S. Rosa and M. Saladin, *Algorithms and Programming*. Bandung, 2010.

[16] D. L. Gaol, "The Design of Try Out Exam Applications Using the Linear Congruent Methods (Lcm).", ed. Medan: Informatics Engineering Study Program, 2014.

[17] A. Gani and L. Marlinda, "Android-Based Trigonometry Learning Application Using the Fisher Yates Shuffle Algorithm. ," *Journal of Computer Engineering,* vol. 3, pp. 114-119, 2017

[18] S. S. Futaki, Marisa, F., Wijaya, I. D, "Desktop-Based Dictionary of Indonesian Cultural Terms Using the Fisher-Yates Method. ," *Journal of Informatics Merdeka Pasuruan,* vol. 3 pp. 71-79., 2018.

[19] Nugraha Ryan, Exridores Edo, and S. Henri, *Application of the Fisher-Yates Algorithm on The Lost Insect Application for the Introduction to Insect Types Based on Unity 3D*. Palembang: Stimik Global Informatika MDP.

[20] M. Hermadya, *Designing an Android-based Junior High School Test Tryout Application.* , Udayana University: Information Technology Department,, 2015.

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