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Effectivity of the Microsoft Excel Application on Student Understanding in Statistics Courses

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Abstract: This research aims to test the effectiveness of the Microsoft Excel application on students' understanding of statistics courses. This research is quantitative research and descriptive data analysis, aimed at measuring students' level of understanding of various statistical concepts. Because research data is in the form of numbers, while descriptive analysis is statistics which functions to provide an overview of the object being studied. In this research, researchers used a total sampling technique where the entire population was sampled. So a sample of 22 people was obtained. For data collection, researchers used an online questionnaire method using Google form, the data obtained was analyzed using descriptive analysis. Of the 25 participants, 22 students answered the questionnaire. Respondents' answers regarding question 1, How often do students use Microsoft Excel (P1), Students who said they used Microsoft Excel several times a week and students who said they used Microsoft Excel once a month had the same percentage, namely 31.8%. Then 9.1% said they rarely use Microsoft Excel. Several things that can be concluded from this research are that it is still found that some students do not understand how to use Microsoft Excel, so there is a need for training for students to introduce and train students in the Regular B Building Engineering Education Study Program more deeply in applying Microsoft Excel in solving problems and processing data. and make it easier to complete assignments in statistics courses.

Keywords: technology, statistics, understanding concepts, microsoft excel.

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INTRODUCTION

Technology that continues to develop rapidly requires agencies to adapt and utilize it, one example is computer technology which has become an important tool in various sectors (Absa et al., 2023; Lubis, 2023). Education plays an important role in equipping individuals with the knowledge, skills and values needed to adapt to environmental changes (Dasopang et al., 2023; Fatwa et al., 2023; Santrock, 2011). The process of changing student roles from middle school to college is very significant (Lubis, 2019; Nurliza et al., 2024; Silvia et al., 2023). Students are no longer only focused on their education, but how they develop their knowledge is also taken into account in higher education (Jamal, 2017). Helping in understanding statistics courses is a common thing for

Medan State University students, especially students in the building engineering education study program.

Statistics is a science that studies techniques for collecting data, summarizing, presenting, processing and analyzing data needed to solve problems in society (Fatwa et al., 2024; Sinaga et al., 2023). In the world of education, especially higher education, statistics is needed to help solve problems in qualitative research and quantitative research (Waruwu et al., 2022). In various study programs at universities, Statistics courses are required to be taught. This aims to enable students to understand statistical concepts and procedures in depth, so that they are able to use them to analyze various problems that they will research in the future (Agung, 2017). Even though there are various obstacles in processing research data, students have many choices of methods and tools to complete it. Various statistical data processing applications are available to assist them in analyzing research data and in inputting data in statistics courses (Najib, 2022).

Research, which consists of collecting, processing, analyzing, interpreting and drawing conclusions from data, makes extensive use of statistical applications. This systematic and scientific research process produces a complete and accountable report (Novita, 2023). The data used in statistics is data in the form of numbers or called quantitative data. Therefore, for students, statistics courses are subjects that are feared, shunned, and considered difficult, just like mathematics lessons, which are always said to be the most difficult subjects. In fact, for students, statistics courses are very important because they will be very useful when writing a thesis for students (Marito, 2022)

Currently, statistical data processing is easily accessible with various software options. Starting from free ones like Microsoft Excel to paid ones like SPSS, Lisrel, and Minitab. This software has different licenses, some are free to use and some require a subscription. One program that can be used to facilitate statistical data analysis in calculating measurements of data concentration and distribution is using Microsoft Excel (Niati, 2019).

This Microsoft Excel application is an automatic data processor which can take the form of basic calculations, use of formulas, use of functions, create graphs, process data and tables, and data management (Pratama, 2021). However, in using functions we must understand the meaning of This function and its Excel logic. If we use the function incorrectly, it can cause errors when reading the data (Z et al., 2021). Microsoft Excel is present as reliable software specifically designed to help solve various administrative problems, from the simplest to the most complex (Baharuddin, 2021). Equipped with complete and easy-to-use calculation and graphing features, Excel is an ideal tool for increasing efficiency and productivity in various fields of work (Dhakirah, 2023). Excel's popularity cannot be separated from Microsoft's aggressive marketing strategy, making it one of the most widely used computer programs to date. (Najib, 2022)

The Computer Program course includes the Microsoft Excel (MS Excel) application in the core material to assist students in processing statistical data in their final assignment. Manual statistical data processing can be verified with MS Excel. Various mathematical and statistical functions enable fast calculations and presentation of data in the form of tables, graphs and diagrams (Patmawati, 2019).

It was revealed (Abadi, 2022) in the research of Hetty Patmawati & Satya Santika, (2016) that students used manual calculations to process their research data. This manual calculation uses a scientific calculator and also uses the Microsoft Excel application program as an alternative form of statistical data processing for the results of the research being carried out. Previously, the courses that had been taken were basic statistics courses and continued with computer programs in which there was Microsoft Excel material which really helped students in processing statistical data resulting from research carried out by students (Andriyani, 2019).

METHODS

This research is quantitative research and descriptive data analysis, aimed at measuring students' level of understanding of various statistical concepts. Because research data is in the form of numbers, while descriptive analysis is statistics that function to describe or provide an overview of the object being studied. In this research, researchers used a total sampling technique where the entire population was sampled. So a sample of 22 people was obtained. For data collection, researchers used an online questionnaire method using Google form, then the data obtained from the instrument was analyzed using descriptive analysis.

The research design used in this research uses descriptive quantitative research. Quantitative research methods are methods that are based on the philosophy of positivism, used in researching samples and research populations. Quantitative research is research that presents data in the form of numbers as the results of the research. Meanwhile, the descriptive research method is a method for researching the status of a human group, an object, a condition, a thought, or a current event. The descriptive method is used to create a systematic, factual and accurate picture or description of existing phenomena. Quantitative descriptive research is research that describes variables as they are, supported by data in the form of numbers produced from actual conditions.

The population in this study were students of the Building Engineering Education Study Program Semester 6, Regular class B, who were taking statistics courses for the 2021/2022 academic year, totaling 25 students. Sampling using total sampling technique. The following is a table of distribution of the number of Building Engineering Education students.

TABLE 1. *Research Sample*

No	Number of Students	Students Filling Out Questionnaires
1	25	22

Therefore, the entire sample was determined to be 22 students. A total of 3 students did not fill in the questions in the questionnaire. The data collection used to determine the effectiveness of the Microsoft Excel application in the Statistics course was obtained through data collection through questions that had been compiled into a Google form. The aim of collecting data using Google Form is to make students more comfortable so that the respondents can convey all the information they provide, and they have plenty of time to fill in and pay attention to each question.

This research was conducted in order to determine the effectiveness of the Microsoft Excel application in the Statistics course for students of the Regular B Building Engineering Education Study Program, which includes several stages. The first stage is creating a measurement instrument in the form of a questionnaire using Google Form. Next, in the second stage, questionnaire data was distributed to students of the Regular B Building Engineering Education Study Program who had taken statistics courses for the 2021/2022 academic year as respondents. The questionnaire distributed is in the form of a questionnaire link that has been created. Then the results of filling out the questionnaire will be processed and analyzed to produce conclusions.

The data analysis technique in this research uses qualitative descriptive techniques. Data analysis is carried out during and after data collection, so that the data obtained is arranged systematically and easier to interpret according to the problem formulation. To determine the effectiveness of the Microsoft Excel application in the Statistics course for students of the Regular B Building Engineering Education Study Program, the questions from the questionnaire data are categorized into several sections, including:

Q 1: How often do students use Microsoft Excel?
Q 2: How often do students use complex Microsoft Excel formulas?
P 3: Microsoft Excel efficiency helps in managing and analyzing data
P 4: Feel that Microsoft Excel makes it easy to create graphs or visualize data
P 5: Microsoft Excel's ability to process and process data
P 6: Microsoft Excel helps in completing academic assignments
P 7: Microsoft Excel helps in creating informative reports or presentations
P 8 : Microsoft Excel increases efficiency and productivity in work or study
Q 9: How familiar are you with Microsoft Excel features such as SUM, AVERAGE, and IF
Q 10: How often do you use the PivotTable or PivotChart feature
Q 11: How often do you use filters or sorting data in Microsoft Excel?
P 12: How often do you use statistical formulas such as AVERAGE, STDEV, COUNTIF
P 13: Microsoft Excel makes it easy to analyze data or create data
P 14: Microsoft Excel uses language that is easy to understand
P 15: Microsoft Excel can motivate the learning process.

RESULTS

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 1, How often do students use Microsoft Excel (P1) were obtained as in Figure 1, Students who said they used Microsoft Excel several times a week and students who said they used Microsoft Excel once a month had the same percentage, namely 31.8%. Then there were students who stated that 27.3% of them used Microsoft Excel every day. Then the rest said they rarely used Microsoft Excel as much as 9.1%.

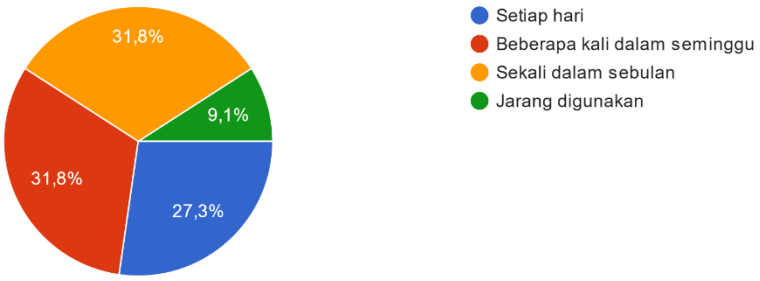

Figure 1. *Results of filling out the P1 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 2, How often do students use complex Microsoft Excel formulas (P2) were obtained as in Figure 2. Students who stated that they sometimes used complex Microsoft Excel formulas were 36.4%. Then, 27.3% of students stated that they often used complex Microsoft Excel formulas.

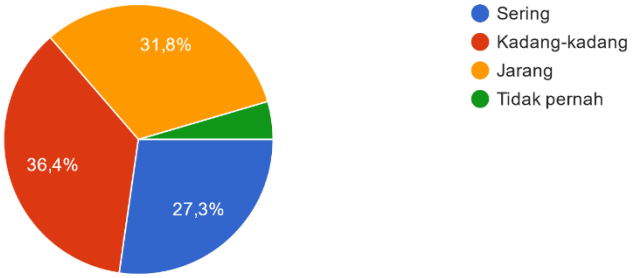

Figure 2. *Results of filling out the P2 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 3, The efficiency of Microsoft Excel in helping to manage and analyze data (P3) was obtained as in Figure 3. Students who stated that it was less helpful in managing and analyzing data were 40.9%. Meanwhile, 27.3% of students stated that they were very helpful in managing and analyzing data.

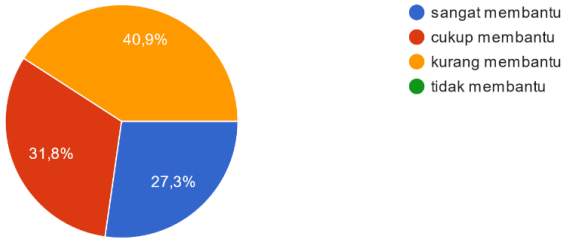

Figure 3. *Results of filling out the P3 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 4, Feeling that Microsoft Excel makes it easy to create graphs or visualize data (P4) were obtained as in Figure 4. Students who stated that it was quite easy to create graphs or visualizations were 36.4%. Meanwhile, 27.3% of students stated that it was not easy to create graphs or visualize data.

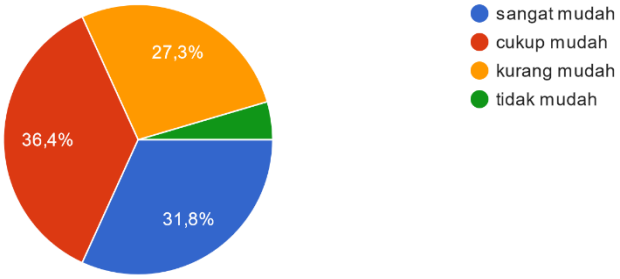

Figure 4. *Results of filling out the P4 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 5, Microsoft Excel's ability to process and process data (P5) were obtained as in Figure 5. Students who expressed satisfaction with Microsoft Excel's ability to process and process data were 54.5%. Meanwhile, students who stated that they were very satisfied with Microsoft Excel's ability to process and process data were 18.2%.

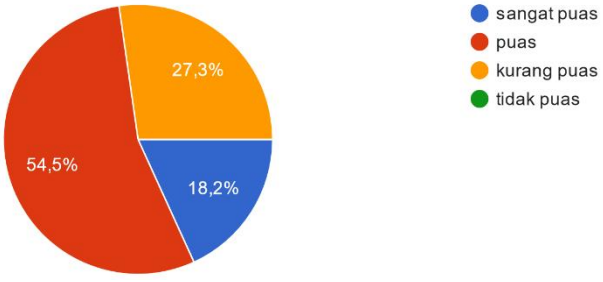

Figure 5. *Results of filling out the P5 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 6, Microsoft Excel helps in completing academic assignments (P6) are obtained as in Figure 6. Students who stated that they were quite helpful in

completing academic assignments were 36.4%. Meanwhile, 27.3% of students said they were very helpful in completing academic assignments.

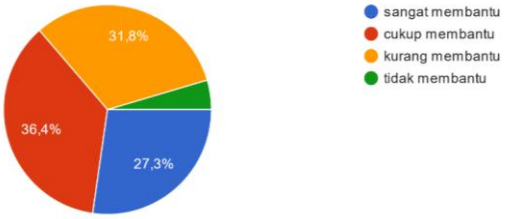

Figure 6. *Results of filling out the P6 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 7, Microsoft Excel helps in making informative reports or presentations (P7) were obtained as in Figure 7. Students who stated that they were quite helpful in making informative reports or presentations were 45.4%. Meanwhile, 22.7% of students stated that they were less helpful in making informative reports or presentations.

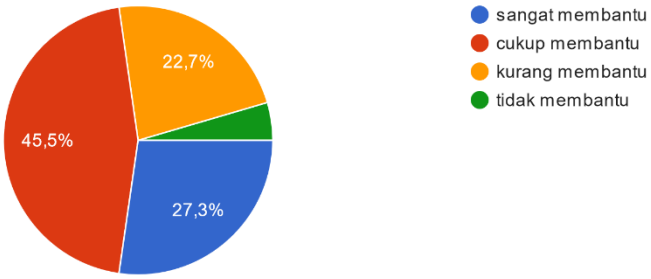

Figure 7. *Results of filling out the P7 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 8, Microsoft Excel increases efficiency and productivity in work or study (P8) are obtained as in Figure 8. Students who stated that they increased efficiency and productivity in work or study were 40.9%. increase efficiency and productivity in work or study 22.7%.

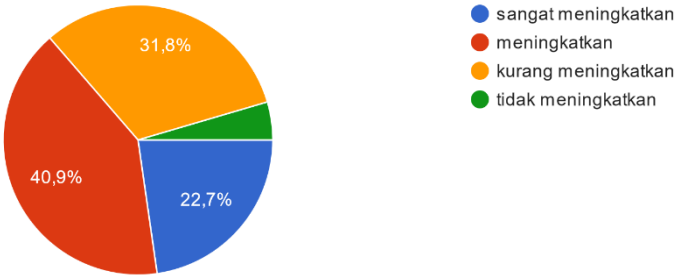

Figure 8. *Results of filling out the P8 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 9, How familiar they are with basic Microsoft Excel features such as SUM, AVERAGE, and IF (P9) are obtained as in Figure 9. Students who stated that they were quite familiar with basic Microsoft Excel features such as SUM, AVERAGE, and IF

were 54.5%. . Meanwhile, 13.6% of students stated that they were very familiar with basic Microsoft Excel features such as SUM, AVERAGE, and IF.

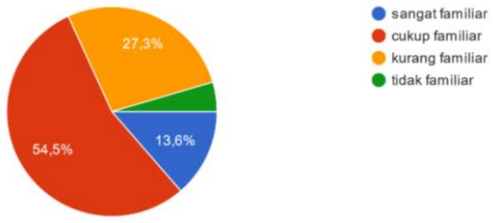

Figure 9. *Results of filling out the P9 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 10, How often do they use the PivotTable or PivotChart feature (P10), were obtained as in Figure 10. Students who stated that they sometimes used the PivotTable or PivotChart feature were 40.9%. Meanwhile, 27.3% of students said they rarely used the PivotTable or PivotChart feature.

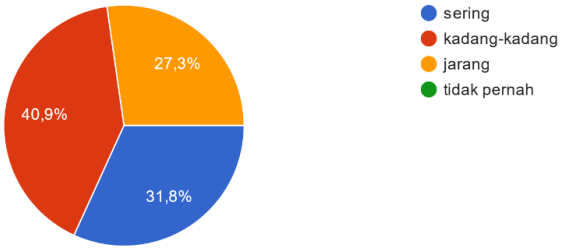

Figure 10. *Results of filling out the P10 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 11, How often do they use filters or sorting data in Microsoft Excel (P11), were obtained as in Figure 11? Students who stated that they often used filters or sorting data in Microsoft Excel were 45.4%. Meanwhile, 27.3% of students said they rarely used filters or sorting data in Microsoft Excel.

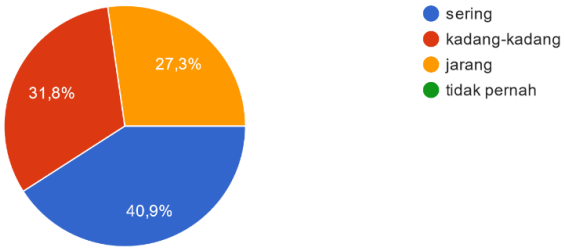

Figure 11. *Results of filling out the P11 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 12, How often do they use statistical formulas such as AVERAGE, STDEV, COUNTIF (P12) are obtained as in Figure 12. Students who stated that they sometimes use statistical formulas such as AVERAGE, STDEV, COUNTIF were 36.4%. Meanwhile, 31.8% of students stated that they often and rarely use statistical formulas such as AVERAGE, STDEV, COUNTIF.

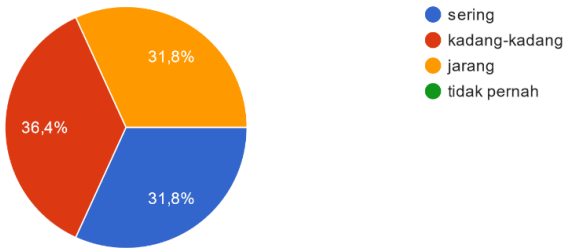

Figure 12. *Results of filling out the P12 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 13, Microsoft Excel makes it easier to analyze data or create data (P13) was obtained as in Figure 13. Students who stated that it made it quite easy to analyze data or create data were 45.5%. Meanwhile, 18.2% of students stated that it was not easy to analyze data or create data.

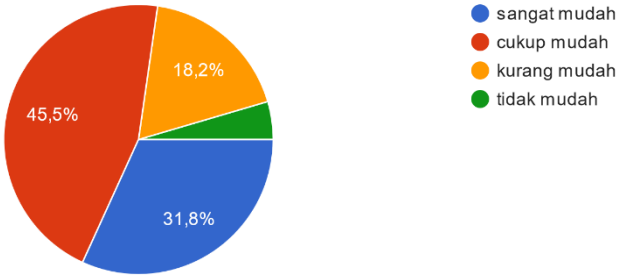

Figure 13. *Results of filling out the P13 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 14, Microsoft Excel uses language that is easy to understand (P14) were obtained as in Figure 14. 50% of students said it was quite easy because they used language that was easy to understand. Meanwhile, 18.2% of students said it was not easy to understand.

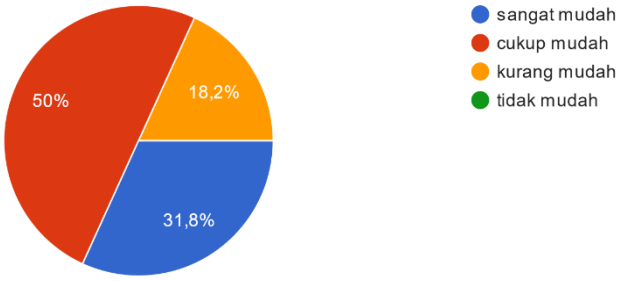

Figure 14. *Results of filling out the P14 questionnaire*

Of the 25 participants, 22 students answered the questionnaire questions. Respondents' answers regarding question 15, Microsoft Excel can motivate the learning process (P15) obtained as in Figure 15, 63.6% of students stated that they were very motivating in the learning process. Meanwhile, 9.1% of students said they lacked motivation in the learning process.

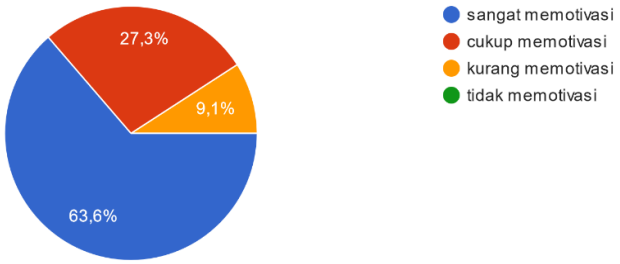

Figure 15. *Results of filling out the P15 questionnaire*

DISCUSSION

Penelitian yang telah dilakukan mendapatkan hasil bahwa Mahasiswa yang menyatakan beberapa kali dan sekali sebulan memakai Microsoft excel sebanyak 31,8%. Kemudian sisanya mengatakan jarang menggunakan Microsoft excel sebanyak 9,1%. Hal ini disebabkan karena adanya aplikasi pendukung lainnya yaitu SPSS, dimana spss ini merupakan aplikasi yang memiliki kemapuan untuk analisis statistika yang cukup tinggi (Handayani, 2023).

Berdasarkan diagram diatas dapat dilihat bahwa efektivitas penggunaan Microsoft excel terhadap Mahasiswa di kategorikan cukup membantu dalam menyelesaikan tugas akademik dengan nilai 36,4%. Responden yang olah datanya merupakan responden yang cukup sering dalam menggunakan Microsoft excel dalam penyelesaian tugas baik dalam pembuatan tabel maupun dalam membuat grafik. Ini membuktikan bahwa penggunaan Microsoft excel cukup efisien dalam kalangan Mahasiswa. Sementara itu, ada juga responden yang menilai bahwa penggunaan Microsoft excel dalam menyelesaikan tugas akademik masih kurang membantu dengan persentase nilai sebesar 31,8%. Berdasarkan data yang didapatkan ini diakibatkan karena rendahnya pengetahuan dan dasar dari responden mengenai penggunaan aplikasi Microsoft Excel (Munir, 2023).

CONCLUSION

Beberapa hal yang dapat disimpulkan dari penelitian ini adalah masih didapati Sebagian Mahasiswa yang belum memahami dalam menggunakan Microsoft excel sehingga perlu adanya pelatihan terhadap Mahasiswa Program Studi Pendidikan Teknik Bangunan Reguler B untuk memperkenalkan dan melatih lebih dalam Mahasiswa Program Studi Pendidikan Teknik Bangunan Reguler B dalam mengaplikasikan Microsoft excel dalam menyelesaikan persoalan baik mengolah data maupun mempermudah dalam penyelesaian tugas mata kuliah statistika.

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