THE INFLUENCE OF CAMPUS ACTIVITIES ON STUDENT'S VISITS TO THE FITNESS CENTER

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***Abstract*—This study explores the impact of class schedules and campus activities on the frequency of students' visits to fitness centers (gyms). In today's modern era, maintaining physical fitness is a crucial aspect that supports health and improves the quality of life. This research aims to analyze the direct impact of class schedules on students' exercise habits. The primary objective is to identify the extent to which class schedules affect the frequency of gym visits. Additionally, this study assesses the influence of participation in campus organizations and activities on students' decisions to exercise at the gym. The findings indicate that a busy class schedule significantly reduces gym visit frequency. However, there is no significant difference in gym visit frequency between active and non-active students in lectures. The semester of study does not significantly impact gym visit frequency, nor does the number of extracurricular activities or courses taken. The research also reveals that the distance to the gym affects visit frequency, suggesting that proximity to fitness centers plays a role in determining how often student's exercise. The study found that students with fewer courses visit the gym approximately 4.7 times per week, and each additional course decreases the frequency by about 0.11 times per week.**

Keywords: Class schedules, campus activities, gym visit frequency, physical fitness, students, student organizations, gym distance.

I. INTRODUCTION

In this fast-paced and modern era, maintaining physical fitness is not only a trend, but also a crucial aspect that supports health and improves overall quality of life. Fitness centers or gyms, with their full range of facilities, have become the main place for many people to perform a series of physical exercises aimed at maintaining and improving their physical condition. A gym or gymnasium according to the Great Dictionary Indonesian is a large room for exercise [1]. In the gymnasium, people can practice and maintain body fitness. In this place can do various types of physical exercise, such as lifting weights, cardio, and strength training, all of which aim to improve or maintain physical fitness. Physical fitness itself is a person's ability and physical endurance in carrying out daily activities without experiencing significant fatigue and still having a reserve of energy to do other activities. Students as part of a dynamic population, are increasingly aware of the importance of physical health and fitness. Those who understand this tend to be more proactive in exercising. However, university for students who have a busy academic schedule and lectures so that time for physical activity such as exercise is reduced [2]. It is undeniable that the intensity of their visits to the gym can be influenced by various external factors, one of which is a busy lecture schedule. Crowded academic schedules often limit the time available for students to participate in physical activity, including exercise. In addition, involvement in activities Extracurriculars or student organizations can also increase their activity load, which in turn can reduce the frequency of visits to the gym. With this phenomenon in mind, this study was designed to explore and examine the direct effect of lecture schedules on the frequency of students visiting gyms. The main objective of this study was to identify and analyze the extent to which lecture schedules affect exercise habits among students.

Based on the formulation of the problem, the objectives of this study can be formulated as follows:

1. Find out whether lectures really affect the intensity of students going to the gym.
2. Find out if students will stop going to the gym because of busy lectures.
3. Analyze whether participation in organizations or lecture activities has an impact on students' decisions to stop exercising at the gym.
4. Comparing the intensity of visits to the fitness center between students

5. Assess whether there is a significant difference in the intensity of visits to the fitness center influenced by the semester of lectures.
6. Measure the effect of the number of activities/organizations that students participate in on the frequency with which they visit the fitness center.
7. Find out whether the number of courses taken can affect the intensity of students to go to the gym.
8. Find out if a student's study major has an influence on their intensity of exercise at the gym.
9. Identify the effect of distance from residence to gym on the frequency of student visits to the fitness center.

This research will contribute to knowledge through increase understanding of the factors that influence students' exercise habits. Secondly, policy by providing a basis for the development of more effective policies in support of physical activity among students. Finally, practice by providing practical guidance for students to manage time and increase the frequency of visits to the gym.

II. LITERATURE REVIEW

No.	Journal Title	Researcher	Data relevancy
1	PENGARUH HARGA, LOKASI DAN PROMOSI TERHADAP KEPUTUSAN PEMBELIAN (Studi Pada Konsumen Empire Gym)	Rosihan Anwar	Statistics
2	PERILAKU AKTIVITAS OLAHRAGA PADA SAAT BULAN RAMADHAN	Isti Dwi Puspitawati	Statistics
3	Get thee to the gym! A field experiment on improving exercise habits	J. M. Schwarz, A. Konrad, J. T. Ly, S. Holtz, and K. Callahan	Statistics
4	A systematic review of interventions to increase attendance at health and fitness venues: Identifying key behaviour change techniques	R. Hanson, S. Jones, and A. Manley	Theory
5	AKTIVITAS OLAHRAGA DI MASA PANDEMI COVID-19 TERHADAP TINGKAT STRES MAHASISWA PENDIDIKAN OLAHRAGA UNIVERSITAS ISLAM KALIMANTAN MUHAMMAD ARSYAD AL BANJARI BANJARMASIN	Novri Asri, Elsi Setiandari L. O.	Statistics
6	Hubungan antara kelelahan, motivasi belajar, dan aktivitas fisik terhadap tingkat prestasi akademik	Seftian SuryaWelong, Aaltje Ellen Manampiring, JimmyPosangi	Statistics
7	HUBUNGAN ANTARA INDEKS MASSA TUBUH DENGAN KEKUATAN OTOT PADA MAHASISWA FAKULTAS KEDOKTERAN UNIVERSITAS MATARAM	Kadek Intan Murti Dewi, Widiastuti I, Wedayani A	Theory
8	PENTINGNYA MANAJEMEN WAKTU BAGI MAHASISWA DALAM MENINGKATKAN PRESTASI BELAJAR DI SEKOLAH TINGGI TEOLOGI DUTA PANISAL JEMBER	Hillary, G., & Grace Ester Kurniawati	Theory
9	Changes in weight, physical activity, sedentary behaviour and dietary intake during the transition to higher education: a prospective study	Benedicte Deforche, Delfien Van Dyck, Tom Deliens & Ilse De Bourdeaudhuij	Statistics & Theory
10	Effect of Physical Exercise on College Students' Life Satisfaction: Mediating Role of Competence and Relatedness Needs	Rui Wu, Jingjing Liu, & Xinming Guo	Theory

Table 2.1 Research Studies

Rosjiban, Anwar (2023). *Pengaruh Harga, Lokasi dan*

Promosi terhadap Keputusan Pembelian (Studi pada Konsumen Empire Gym). This study focuses on the impact of pricing, location, and promotional strategies on gym membership decisions, which is more relevant to marketing and consumer behavior than the direct impact of campus activities on students' visits to the fitness center. Therefore, its relevance to the topic "The Influence of Campus Activities on Student's Visits to the Fitness Center" is low.

Puspitaswati, Isti Dwi (2022). *Perilaku Aktivitas Olahraga pada Saat Bulan Ramadhan.* This research explores how exercise behaviors change during the month of Ramadan. While it examines changes in physical activity, it does not specifically focus on students or the context of campus activities. This study could indirectly relate to students who observe Ramadan and participate in fitness center activities, but it is not specifically about the impact of campus activities on fitness center visits, making its relevance moderate.

Schwarz, J. M., Konrad, A., Ly, T. J., Holtz, K., Callahan, T., Hanson, R., Jones, S., & Manley, A. (2021). *Get the Thee to the Gym! A Field Experiment on Improving Exercise Habits*. This investigation focuses on methods to improve exercise habits through a field experiment. Although the focus on enhancing exercise habits can be relevant to students, the study does not specifically target campus activities or student populations. Its findings might be applied to student contexts, but the direct link to campus activities influencing fitness center visits is moderate.

Hanson, R., Jones, S., & Manley, A. (2021). *A Systematic Review of Interventions to Increase Attendance at Health and Fitness Venues: Identifying Key Behaviour Change Techniques*. This journal reviews strategies to boost attendance at health and fitness centers. While it might provide useful insights for designing programs to encourage student visits to campus fitness centers, it does not directly address the specific influence of campus activities on these visits, thus making its relevance moderate.

Asri, Novri, & Elsi Setiandari, L. O. (2022). *Aktivitas Olahraga di Masa Pandemi Covid-19 terhadap Tingkat Stres Mahasiswa Pendidikan Olahraga Universitas Islam Kalimantan Muhammad Arsyad Al Banjari Banjarmasin*. This study examines the exercise activities of university students during the COVID-19 pandemic and their impact on stress levels. It directly involves student populations and the unique circumstances of campus activities during the pandemic, making it highly relevant to understanding how campus activities influence students' visits to fitness centers.

SuryaWelong, Stefan, Ellen, Aaltje, Manapoaring, JimmyPosangi (2022). *Hubungan antara Kelelahan, Motivasi Belajar, dan Aktivitas Fisik terhadap Tingkat Prestasi Akademik*. This journal explores the relationships between fatigue, learning motivation, physical activity, and academic performance. It is highly relevant as it examines how elements of campus activities, such as academic demands and physical activity, interact and influence each other, providing a comprehensive view of how campus activities impact students' visits to the fitness center.

Intan, Kadek, Dewi, Murti, Widiasuti, I., & Wedayani, A. (2023*). Hubungan antara Indeks Massa Tubuh dengan Kekuatan Otot pada Mahasiswa Fakultas Kedokteran Universitas Mataram*. This investigation looks at the relationship between body mass index (BMI) and muscle strength among medical students. The focus on a specific student population and their physical health directly relates to how aspects of campus activities, including the academic environment and associated stressors, impact visits to the fitness center, making this journal highly relevant.

Hillary, G., & Kurniawati, Ester (2021). *Pentingnya Manajemen Waktu bagi Mahasiswa dalam Meningkatkan Prestasi Belajar di Sekolah Tinggi Teologi Duta Panisal Jember*. This journal discusses the importance of time management for academic success. While primarily about academic performance, it may touch on how students balance exercise with their studies. This indirect relation makes the relevance moderate, as time management can influence how much time students allocate to fitness center visits.

Deforche, Benedicte, Deforche, Delfien Van Dyck, Tom Deleus & Ilse De Bourdeaudhuij (2023*). Changes in Weight, Physical Activity, Sedentary Behavior, and Dietary Intake during the Transition to Higher Education: A Comprehensive Review*. This study provides a comprehensive review of lifestyle changes students experience when transitioning to higher education. It is highly relevant as it directly addresses how the shift to campus life affects physical activity levels, dietary habits, and overall health, illustrating the significant impact of campus activities on students' visits to the fitness center.

Liu, Yu, Jingjing, X., & Guo, Xingming (2023). *Effect of Physical Exercise on College Students' Life Satisfaction: Mediating Role of Competence and Relatedness Needs*. This journal examines the effects of physical exercise on life satisfaction among college students, considering psychological needs such as competence and relatedness. It is highly relevant as it delves into how regular physical exercise within the context of campus activities influences overall well-being and satisfaction, providing valuable insights into the holistic impact of campus activities on students' visits to the fitness center.

III. METHODOLOGY

A. Research Questions

To determine the objectives of the research, it is necessary to clarify the research questions. Below are the research questions we used;

1. Does the lecture affect the intensity of students going to the gym?
2. Does the course influence students to stop going to the gym?
3. Do students stop going to the fitness center because they participate in lecture organizations/activities?
4. Is there a difference in the intensity of visits to the fitness center between active and inactive students in lectures?
5. Does the semester significantly affect the intensity of students going to the gym?
6. Does the number of activities that students participate in affect the intensity of student visits to the fitness center?

7. Does the number of courses influence students to go to the gym?
8. Can majors influence students' intensity in going to the fitness center?
9. Does the distance of the gym affect the intensity of students to go to the gym?

B. Data Collection

The data collected in this study was gathered through a survey. The survey did not cover the entire population of the country, but rather a sample from the population to represent the whole. The formulated questions can be considered a questionnaire, consisting of relevant questions aligned with the research objectives. The questions used in the questionnaire were systematically arranged to ensure that respondents could easily understand and accurately fill them out, allowing for a smooth research process.

C. Determining Sample

The sampling technique used in this research was Purposive Sampling. Purposive sampling is a non-random sampling technique where the researcher determines the sample selection by establishing specific criteria. In this study, the criteria set were active students and those who regularly visit fitness centers or gyms. The majority of the respondent samples were taken from the 2023 batch of students at Multimedia Nusantara University, who were in their second semester at the time of sampling. Therefore, students were chosen as the respondent criteria for this research.

D. List of Hhypotheses

The hypothesis that will be tested is based on the basic thinking for research purposes. We created 7 hypotheses that will be tested in, namely;

1. Hypothesis 1
   - H0 = There is no relationship between being busy with lectures and the intensity of visits to the fitness center.
   - H1 = There is a relationship between being busy with lectures and the intensity of visits to the fitness center.
   - Assumption: There is a relationship between students who are busy in lectures and the intensity with which students go to the fitness center.
   - Test formula: Chi-square

2. Hypothesis 2
   - H0 = The average intensity of visits to the fitness center is no different or the same between students who are active in lectures and those who are not active.
   - H1 = The average intensity of visits to the fitness center is different between students who are active in lectures and those who are not active.
   - Assumption: Having students who are active in lectures and those who are not active in lectures affects the average intensity of visits to the fitness center.
   - Test formula: Multilinear Regression

3. Hypothesis 3
   - H0 = Distance to the fitness center does not affect the intensity of students visiting the fitness center.
   - H1 = Distance to the fitness center influences the intensity of students visiting the fitness center.
   - Assumption: There is an influence between the distance between a student's house and the fitness center on the intensity of students going to the fitness center.
   - Test formula: Chi-Square

4. Hypothesis 4
   - H0 = The semester of study does not have a significant influence on the intensity of student visits to the fitness center.
   - H1 = The semester of study has a significant influence on the intensity of student visits to the fitness center.
   - Assumption: There is a relationship between students' semester of study and their intensity of visiting the fitness center.
   - Test formula: Anova

5. Hypothesis 5
   - H0 = The density of student course hours has no effect on the intensity of student visits to the fitness center.
   - H1 = The density of student course hours influences the intensity of student visits to the fitness center.
   - Assumption: With students' busy course hours, there is an influence on the intensity of visits to the fitness center.
   - Test formula: Anova

6. Hypothesis 6
   - H0 = The busyness of student organizations has no effect on the intensity of student visits to the fitness center.
   - H1 = The busyness of student organizations influences the intensity of student visits to the fitness center.
   - Assumption: The number of organizational activities that students take part in can influence the intensity of visits to the fitness center.
   - Test formula: T-test

7. Hypothesis 7
   - H0 = Student body weight does not have a significant influence on the length of time

students start going to the fitness center.

- H1 = Student body weight has a significant influence on the length of time students start going to the fitness center.
- Assumption: There is a relationship between a student's weight and the length of time the student starts going to the fitness center.
- Test formula: Linear Regression

E. Formula Used

1. **Chi-Square - Shapiro Wilk**

Chi-Square test is used to test whether there is a relationship between two categorical variables. This test can also be used to test whether the distribution of observations in the sample matches the expected distribution [11]. The

$$x^2 = \sum \frac{(O - E)^2}{E}$$

formula for chi-square is:

X^2 = Chi-Square Value
Oi = Frequency of observed results or observed value
Ei = Expected frequency or expected value

The Shapiro Wilk Test is a method or formula for calculating data distribution that was first created by Shapiro and Wilk. The Shapiro Wilk method is an effective and valid data normality test method used for samples that are classified as small. In its implementation, Shapiro Wilk itself has conditions of use so that errors do not occur in its implementation, namely, quantitative interval scale data, single data or not yet grouped in frequency distribution tables, and also data from random samples [11]. The formula can be described as:

$$T_3 = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X_{n-i+1} - X_i)\right]^2$$

D = Shapiro-Wilk test coefficient.
X{n-i+1} = (n-i+1) number in the data.
Xi = (i)th number in the data.
X = Average

2. **Multilinear Regression**

Multiple regression is a statistical technique that can be used to analyze the relationship between one dependent variable and several independent variables. The purpose of multiple regression analysis is to use independent variables whose values are known to predict the value of a single dependent value. Each predictor value is weighted, the weight indicates its relative contribution to the overall prediction [12]. Meanwhile, in multiple regression there is a beta frequency value which can be formulated as:

$$y = \beta_0 + \beta_1 X_1 + \ldots + \beta_n X_n + \epsilon$$

3. **Linier Regression**

Linear regression is a data analysis technique formula that predicts unknown data values using other related and known data values. Mathematically modeling unknown or dependent variables and known or independent variables as linear equations. Linear regression models are relatively simple and provide easy-to-interpret mathematical formulas to generate predictions. Linear regression is an existing statistical technique that is easy to implement in software and computing [13]. Formula that can be used:

$$Y = a + bX$$

$$a = \frac{(\sum Y)(\sum X^2) - (\sum X)(\sum XY)}{n\sum X^2 - (\sum X)^2} \qquad b = \frac{n\sum XY - (\sum X)(\sum Y)}{n\sum X^2 - (\sum X)^2}$$

Y = criterion variable
X = predictor variable
A = constant variable
B = linear regression direction coefficient

4. **ANOVA**

Commonly called Analysis of Variance or ANOVA test, it is a statistical method used to test differences between two or more groups. This method was developed by Ronald Fisher and is often used in data analysis, especially in the fields of research and marketing. One of the main uses of the ANOVA test is its ability to compare three or more samples at the same time [14]. The ANOVA formula can be described as follows:

$$SS_T = \sum (X_{ij})^2 - \frac{(\sum T_j)^2}{n}$$

SST = total sum of squares
SSC = treatment sum of squares
SSE = error sum of squares
i = particular mem
j = treatment level
C = number of treatment levels
nj = number of groups or groups
X_ = overall mean (grand average)
X_j = mean of a group or groups

Xij = individual value (data)

5. T-Test

The t-test is an inferential statistic used to determine whether there is a significant difference between the means of two groups and how they are related. The T-test is used when the data set follows a normal distribution and has unknown variance. The t-test is a test used to test hypotheses in statistics and uses t-statistics, t distribution values, and degrees of freedom to determine statistical significance. The t-test compares the mean values of two data sets and determines whether they come from the same population [15]. The formula is:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{(s^2(\frac{1}{n_1} + \frac{1}{n_2}))}}$$

X1 = Sample mean 1
X2 = Sample mean 2
S = Standard deviation
S^2 = Sample variance

6. Kolmogorov-Smirnov

The Kolmogorov Smirnov test is one of the most frequently used formulas in the field of data science. Even though it sounds complicated, the Kolmogorov Smirnov test is not as difficult as it sounds. The one-sample Kolmogorov-Smirnov test is a goodness-of-fit test, because the focus is to see the suitability of the distribution between the two samples. Usually, the sample being compared is an observed distribution sample with a theoretical distribution sample or standard distribution. This test can be used when there are two data distribution samples that you want to compare, namely the observed sample and the standard distribution sample, if there are more than two data samples you want to compare, and the data is discrete [16].

7. Durbin-Watson test

Durbin Watson (DW) statistics is an autocorrelation test on the residuals of a statistical model or regression analysis. The Durbin-Watson statistic will always have a value that ranges between 0 and 4. A value of 2.0 indicates no autocorrelation was detected in the sample. Values from 0 to less than 2 indicate positive autocorrelation and values from 2 to 4 indicate negative autocorrelation. The rule of thumb is that a DW test statistic value in the range of 1.5 to 2.5 is relatively normal. However, values outside this range may cause concern. Durbin–Watson statistics, although performed by many regression analysis programs, cannot be applied in certain situations [17].

IV. RESULTS AND DISCUSSION

A. *Data Visualization*

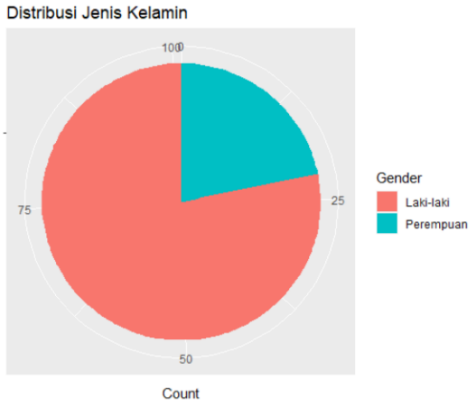


Figure 4.1 Gender Distribution

In the pie chart above, a total of 80 male students and 22 female students who go to the gym. In this pie chart, we show how many male and female students have answered the questionnaire.

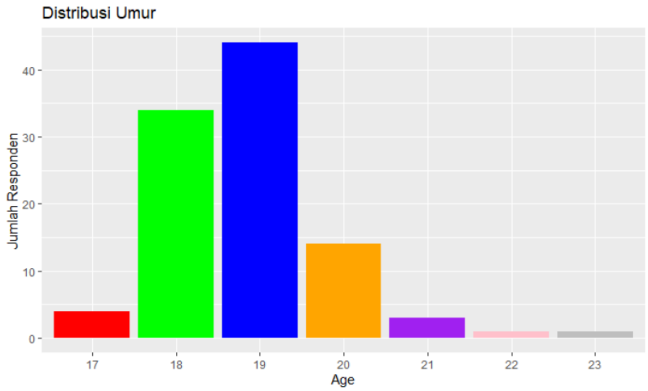


Figure 4.2 Age Distribution

In the bar plot above, it can be seen that the majority of respondents in this survey are aged 19 (Blue) with the number of answered surveys being 44 students. In second place is age 18 (Green) with a total of 34 students. In third place are those aged 20 (Oren) with a total of 14 students. In fourth place is at age 17 (Red) with a total of 4 students. In fifth place there is age 21 (Purple) with a total of 3 students. In last place there are ages 22 and 23 (Pink and Grey) with 1 student each.

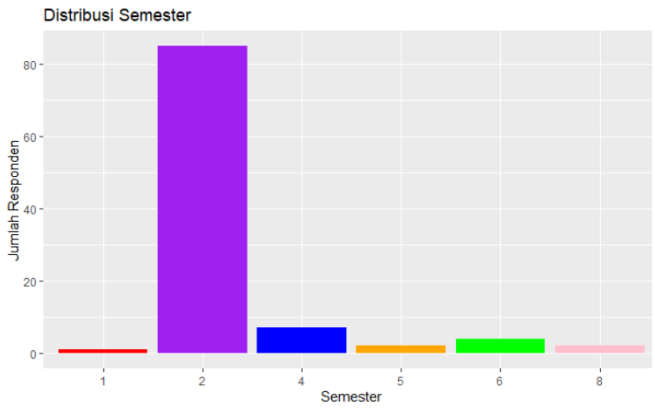


Figure 4.3 Semester Distribution

In the bar plot above, it shows the semester students of respondents in the survey. The majority of those who answered the survey were in semester 2 (Purple) with a total of 86 students. In second place is semester 4 (Blue) with a total of 7 students. In third place is in semester 6 with a total of 4 students. In fourth place are semesters 5 and 8 (Orange and Pink) with 2 students each. In last place is semester 1 (Red) with 1 student.

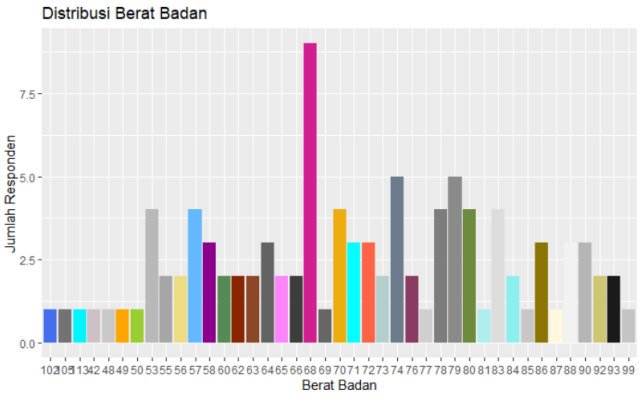


Figure 4.4 Weight Distribution

In this survey, the majority weighed around 70-79 kg, the number being 29 students. In second place is a body weight of around 60-69 kg with a total of 23 students. In third place there are 80-89 kg with a total of 19 students. In fourth place is 50-59 kg with a total of 16 students. In fifth place is 90-99 kg with a total of 9 students. In fifth place it is at 40-49 kg with a total of 3 students and the last is at 100-109 kg with a total of 2 students.

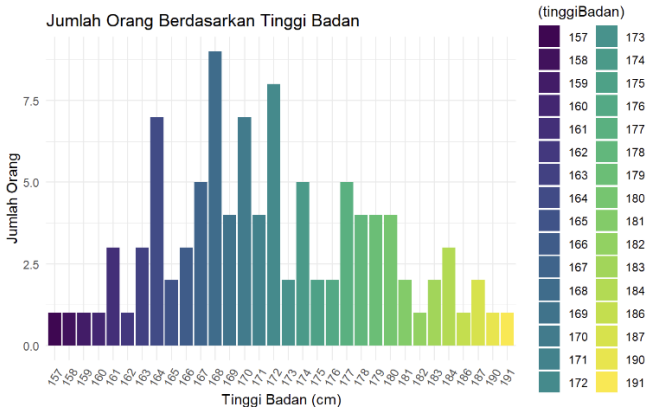


Figure 4.5 Height Distribution

The bar plot visualization above shows the distribution of height data for students who filled out the survey in centimeters. If seen through this visualization, the highest body height is 168 cm. The distribution visualized above appears to show a distribution that tends to be normal because the number of heights corresponds to the average normal height for teenage students. However, there are outliers that show height below the normal limit for student-aged adolescents, namely 157 cm and above the normal limit for student-aged adolescents, namely 191 cm.

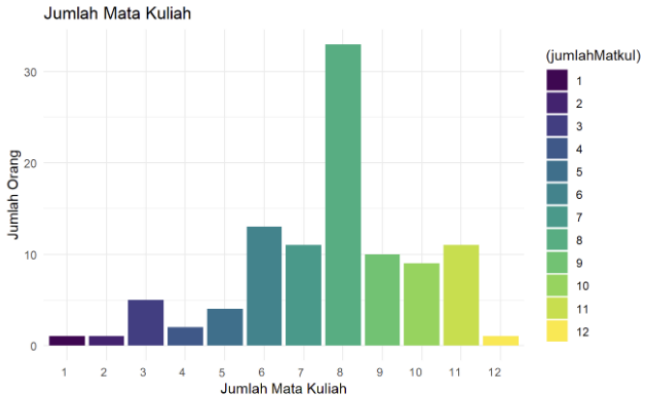


Figure 4.6 Number of Classes Distribution

The number of courses will greatly influence the intensity of students go to the fitness center. In the visualization above, the majority of students took 8 courses with a total of 33 students. In second place, students who took part in the survey took 6 courses with a total of 13 respondents. In third place, there are 11 students taking 11 courses. Followed by the choice of number of courses from the smallest taking 1 course to the maximum taking 12 courses.

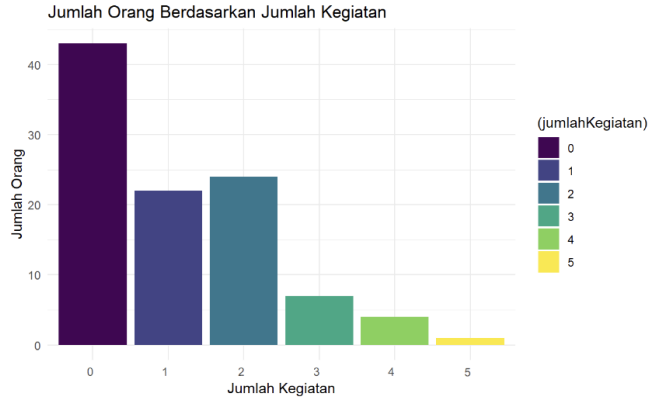


Figure 4.7 Number of Activities Distribution

The survey asked how many organizations / activites students took part in to assess their level of activity. Through this visualization, the majority of respondents that answered have 0 organizational activities. Followed by 2 organizations being taken, and a maximum of up to 5 organizations being taken at once.

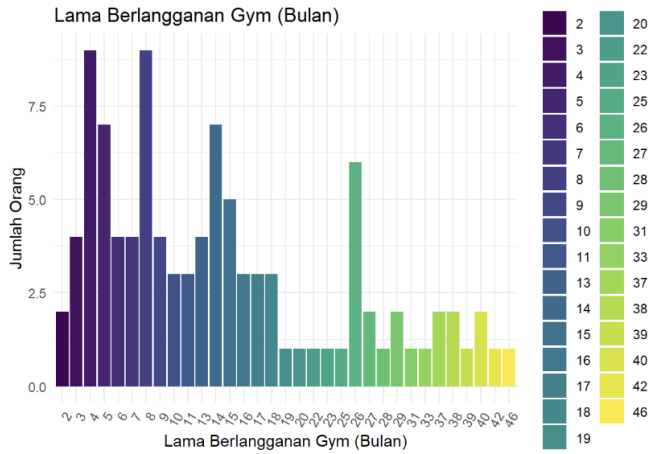


Figure 4.8 Gym Membership Period Distribution

The bar plot visualization above shows the distribution of the number of months students have subscribed to the fitness center. The majority of respondents had subscribed to the gym for between 3 months and 8 months, with the same number being 8 students. The other number of respondents tended to be 14 months or more than 1 year old who had subscribed to a fitness center. However, there are students who have been going to the high fitness center for 26 months to 46 months or more than 2 years.

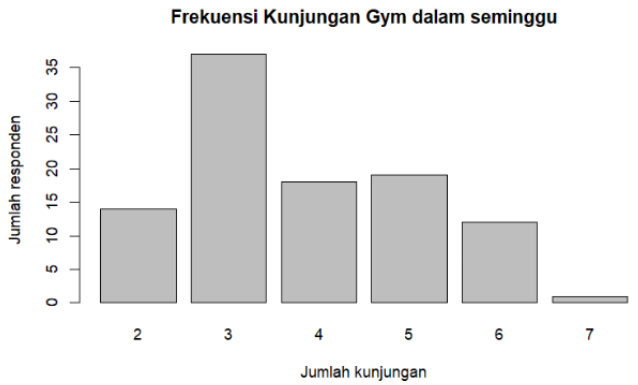


Figure 4.9 Gym Visits per Week Distribution

The barplot visualization above shows the distribution of the frequency of gym visits in a week. The majority of respondents visit the gym 3 times a week, we can see from the highest bar on the graph. The number of respondents who visit the gym 4 and 5 times a week is almost the same. Relatively few respondents visit the gym 2 or 6 times a week. Very few respondents visit the gym 7 times a week. Overall, the distribution tends to center around 3-5 gym visits per week, with infrequent (2 or less) or very frequent (6 or more) visits occurring less frequently. This data shows that the most common frequency of gym visits among respondents is 3 times a week.

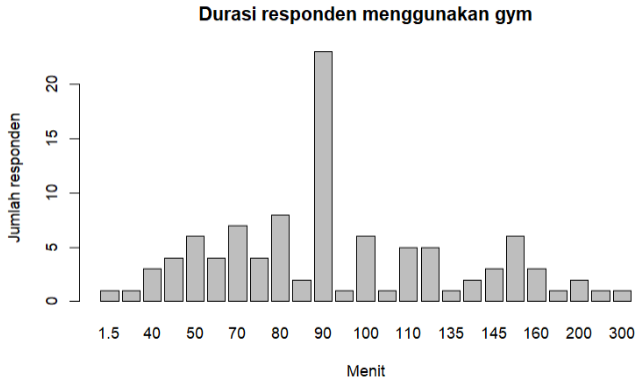
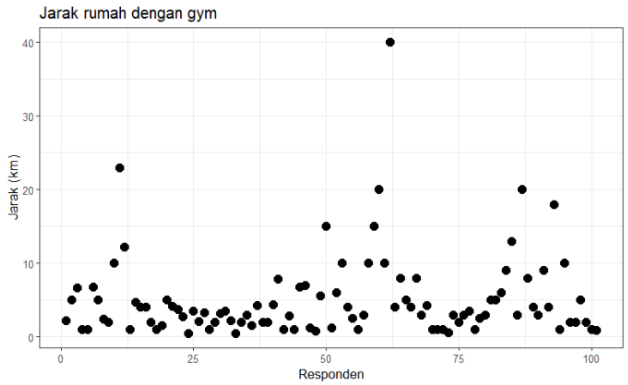


Figure 4.10 Duration of Gym Usage Distribution

This visualization shows the distribution of the duration of respondents using the gym in minutes. The majority of respondents use the gym for 90 minutes, as seen from the highest bar on the histogram. The duration of gym use is not normally distributed. The data tends to be skewed to the right, although slightly, with most respondents using the gym for less than 100 minutes. There was considerable variation in the duration of gym use, ranging from 1.5 minutes to 300 minutes. The histogram shows several peaks (multimodal), indicating there may be several groups of respondents with different gym use patterns. Such as, the group that exercised briefly, the group that exercised for a moderate duration, and the group that exercised extreme. The asymmetric distribution suggests that the average may not be a representative measure to describe overall duration of gym use.



Gambar 4.11 Distribusi jarakGym

Figure 4.11 Gym Distance Distribution

This visualization displays a scatter plot depicting the distance between the respondent's house and the gym. The x-axis shows the respondent number (from 1 to 100), and the y-axis shows the distance in kilometers. In general, there was no clear pattern or trend between respondent numbers and distance from home to gym. The data points are randomly distributed across the plot and most of the distances are under 10 km. The majority of respondents live within 10 km of the gym, but there are several outliers with a further distance, up to 40 km, which may indicate incorrect content from the respondents. There are some interesting outliers, especially respondents whose home is more than 20 km from the gym. From this scatter plot it can be concluded that there is no clear correlation or relationship between the respondent's number and the distance from their house to the gym. Outlier data shows that some respondents are willing to travel longer distances to reach the gym.

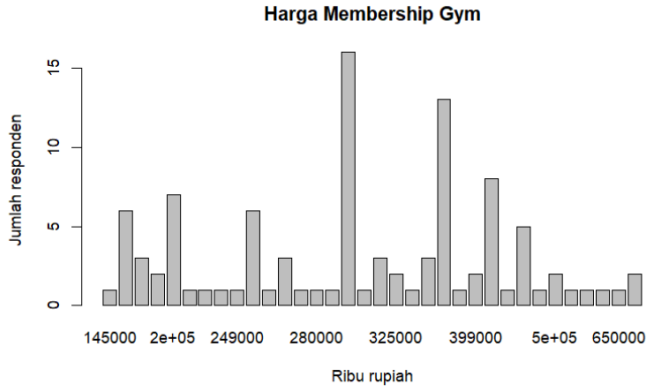


Figure 4.12 Gym Membership Price Distribution

This visualization shows the distribution of gym membership prices in thousands of rupiah. The most common gym membership price is around 300 thousand rupiah, which can be seen by the highest bar on the histogram. The distribution of gym membership prices is uneven where there are several peaks in the histogram indicating some of the more popular price groups. Gym membership prices vary from around 150 thousand rupiah to 650 thousand rupiah. There are several outliers with higher gym membership prices, above 500 thousand rupiah. Uneven distribution indicates that there are several more affordable price levels on the market.

B. Normality Testing

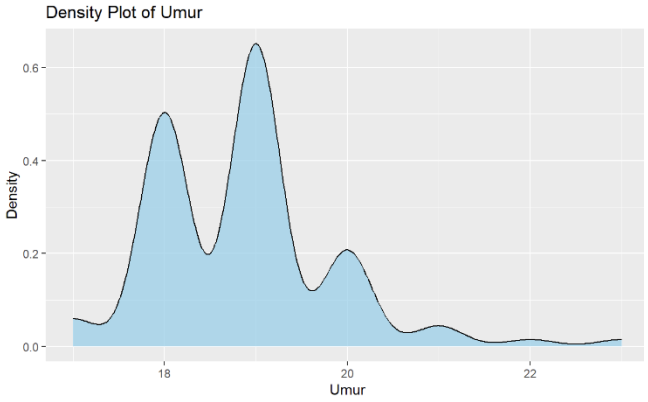


Figure 4.13. Density Plot of Umur

```
        Shapiro-Wilk normality test

data:  data$`Umur Sekarang (Cth: 18)`
W = 0.85278, p-value = 1.33e-08

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  17.00   18.00   19.00   18.85   19.00   23.00
[1] 0.9938424
```

Figure 4.14. Shapiro Wilk test on Umur

This plot depicts the distribution of age as x and density as y. The x value range which means age is 0 to 23 and the y value which means density is in the range 0.00-0.08. However, based on the density line, there is some data that does not follow it, indicating that the data distribution is not normal or not Gaussian (Skewed Right - Positive Skew). With the results of the Shapiro Wilk test, it produces a value of W=0.85278 which deviates quite far from the value of 1 which indicates a deviation from normality. Then, the very small p-value, namely 1.33e-08, indicates that there is strong evidence that rejects H0 or that it is not normally distributed.

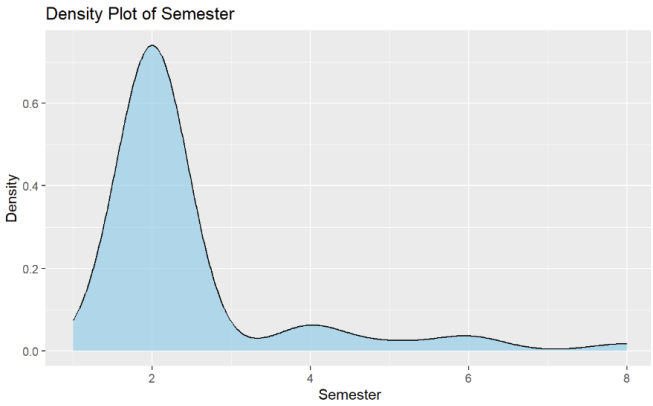


Figure 4.15 Density Plot of Semester

```
        Shapiro-Wilk normality test

data:  data$Semester
W = 0.45663, p-value < 2.2e-16

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  1.000   2.000   2.000   2.465   2.000   8.000
[1] 1.269365
```

Figure 4.16. Shapiro Wilk test on Semester

This plot depicts the semester distribution as x and density as y. In the x value range which means semester is in the range 1 to 8 and the y value which means density is in the range 0.00-0.08. However, based on the density line, there is some data that does not follow it, indicating that the data distribution is not normal or not Gaussian (Skewed right - Positive skew). With the results of the Shapiro Wilk test, it produces a value of W=0.45663 which deviates far from the value of 1 which indicates a deviation from normality. Then, a very small p-value, namely <2.2e-16, indicates that there is strong evidence that rejects H0 or that it is not normally distributed.

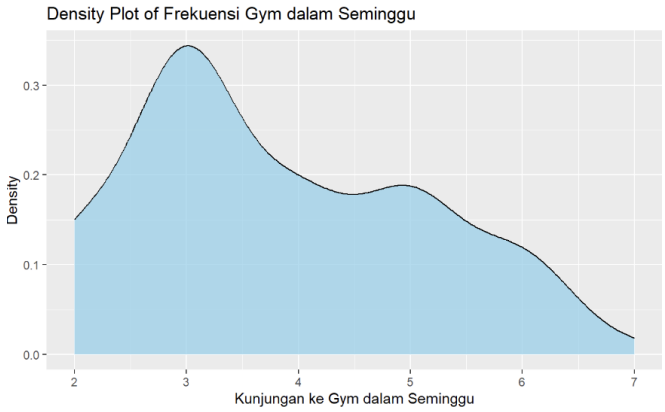


Figure 4.17 Density Plot of Frekuensi Gym

```
        Shapiro-Wilk normality test

data:  data$frekuensiGymSeminggu
W = 0.89846, p-value = 1.079e-06

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  2.000   3.000   3.000   3.812   5.000   7.000
[1] 1.286179
```

Figure 4.18 Shapiro Wilk test on FrekuensiGymSeminggu

This plot depicts the distribution of visits to the gym in a week as x and density as y. The x value range which means visits to the gym in a week is 1 to 7 and the y value which means density is in the range 0.00-0.04. However, based on the density line, there is some data that does not follow it, indicating that the data distribution is not normal or not Gaussian (Skewed right - Positive skew). With the results of the Shapiro Wilk test, it produces a value of W=0.89846 which deviates quite far from the value of 1 which indicates a deviation from normality. Then, the very small p-value, namely 1.079e-06, indicates that there is strong evidence that rejects H0 or that it is not normally distributed.

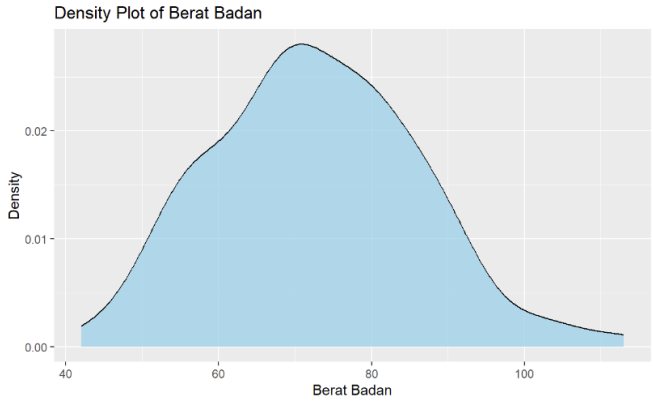


Figure 4.19 Density Plot of Berat Badan

```
        Shapiro-Wilk normality test

data:  data$beratBadan
W = 0.99027, p-value = 0.6798

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  42.00   64.00   72.00   72.72   81.00  113.00
[1] 13.42469
```

Figure 4.21 Shapiro-Wilk test on BeratBadan

This plot describes the weight distribution as x and density as y. The x value range means body weight from 1 to 100 and the y value means density in the range 0.00-0.03. Based on the density line, it can be seen that the visualization refers to the normality of the data because it is similar to a bell. NWith the results of the Shapiro Wilk test, the value W = 0.99027 is very close to the value 1 and deviates slightly, indicating that the data tends to be normally distributed. Then, the p-value which is above 0.05, namely 0.6798, indicates that there is no strong evidence that rejects H0. In the context of the normality test, the results of this test indicate that the Body Weight variable tends to be normally distributed.

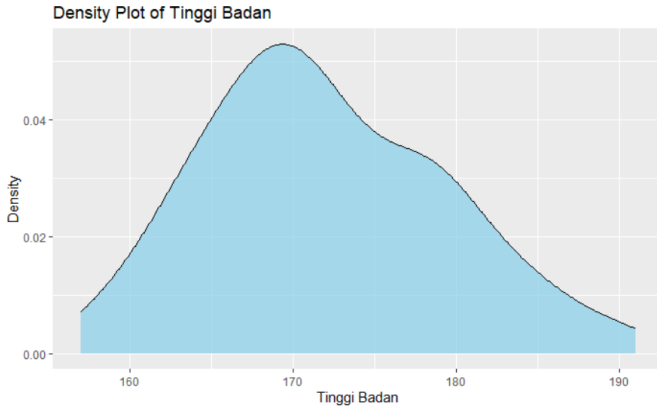


Figure 4.22 Density Plot of Tinggi Badan

```
        Shapiro-Wilk normality test

data:  data$tinggiBadan
W = 0.98219, p-value = 0.1909
```

Figure 4.23 Shapiro-Wilk test on TinggiBadan

This plot depicts the distribution of body height as x and density as y. In the x value range which means body height with a range of 160-190 cm and the y value which means density with a range of 0.00-0.04. However, if we look at the density line, there is some data that does not follow it, which may indicate that the data distribution is not normal or Gaussian. Based on the Shapiro-Wilk test results shown in the figure, the p-value is 0.1909. This p-value is greater than 0.05, which means we fail to reject the null hypothesis that the data is normally distributed.

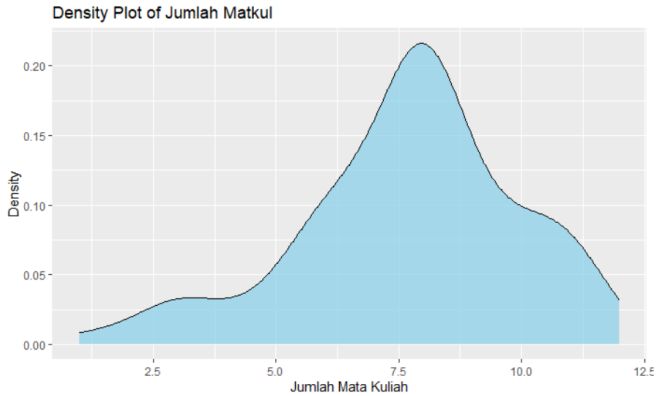


Figure 4.24 Density Plot of Jumlah Mata Kuliah

```
        Shapiro-Wilk normality test

data:  data$jumlahMatkul
W = 0.94036, p-value = 0.0001878
```

Figure 4.25 Shapiro-Wilk test on JumlahMatkul

This plot depicts the distribution of the number of courses as x and density as y. In the x value range which means the number of courses with a range of 0-12 courses and the y value which means density with a range of 0.00-0.20. However, if we look at the density line, there is some data that does not follow it, which may indicate that the data distribution is not normal or Gaussian. Based on the Shapiro-Wilk test results shown in the figure, the p-value is 0.0001878. This p-value is smaller than 0.05, which means we reject the null hypothesis that the data is normally distributed.

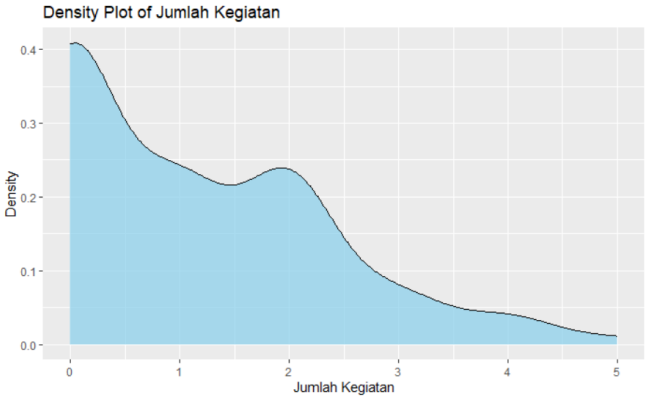


Figure 4.26 Density Plot of Jumlah Kegiatan

```
        Shapiro-Wilk normality test

data:  data$jumlahKegiatan
W = 0.8275, p-value = 1.668e-09
```

Figure 4.27 Shapiro-Wilk test on JumlahKegiatan

This plot depicts the distribution of the number of courses as x and density as y. The x value range means the number of activities with a range of 0-5 activities and the y value means density with a range of 0.00-0.04. However, there is some data that does not follow the density line, which may indicate that the data distribution is not normal or Gaussian. Based on the Shapiro-Wilk test results shown in the figure, the p-value is 1.668e-09. This p-value is smaller than 0.05, which means the null hypothesis that the data is normally distributed is rejected.

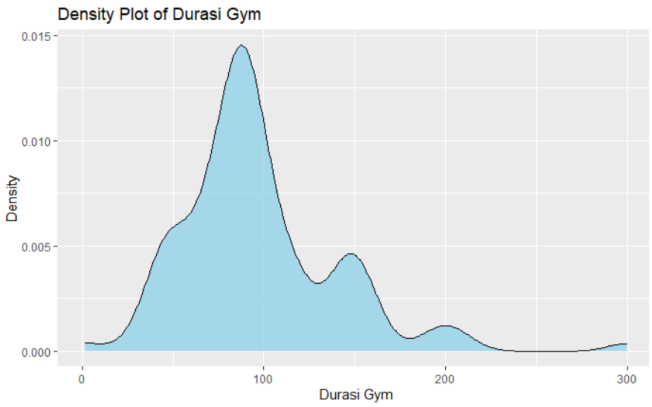


Figure 4.28 Density Plot of Durasi Gym

```
        Shapiro-Wilk normality test

data:  data$durasiGym
W = 0.90182, p-value = 1.556e-06
```

Figure 4.29 Shapiro-Wilk on DurasiGym

This plot depicts the distribution of gym duration as x and density as y. In the x value range which means the duration of the gym with a range of 0 - 300 minutes and the y value which means density with a range of 0.00-0.015. However, there is some data that does not follow the density line, which may indicate that the data distribution is not normal or Gaussian too. Apart from that, it can also be seen that the data distribution has an asymmetrical shape and has many peaks. Based on the Shapiro-Wilk test results shown in the figure, the p-value is 1.556e-06. This p-value is smaller than 0.05, which means the null hypothesis that the data is normally distributed is rejected.

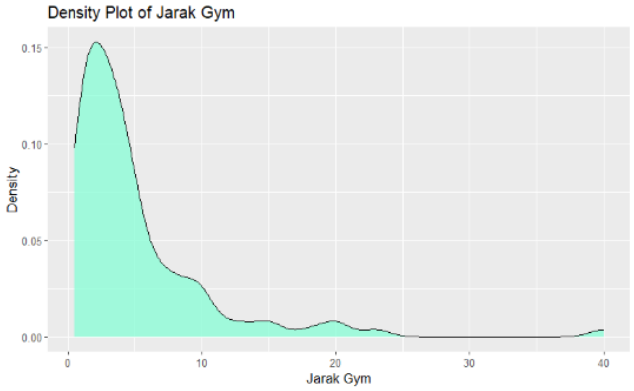


Figure 4.30 Density Plot of Jarak Gym

```
        Shapiro-Wilk normality test

data:  data$jarakGym
W = 0.67515, p-value = 1.249e-13

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.500   2.000   3.300   5.074   6.000  40.000
```

Figure 4.31 Shapiro-Wilk test on JarakGym

Based on the results of the Shapiro-Wilk test on JarakGym, p-value = 1.249e-13. Because the p-value (1.249e-13) is a very small number and far below the alpha significance level (0.05), the null hypothesis which states that the data is normally distributed is rejected. The Shapiro-Wilk test shows that the Gym distance data is not normally distributed. The density plot also shows this, with a distribution that is skewed to the right and there are several outlier values that are far above the majority of the data.

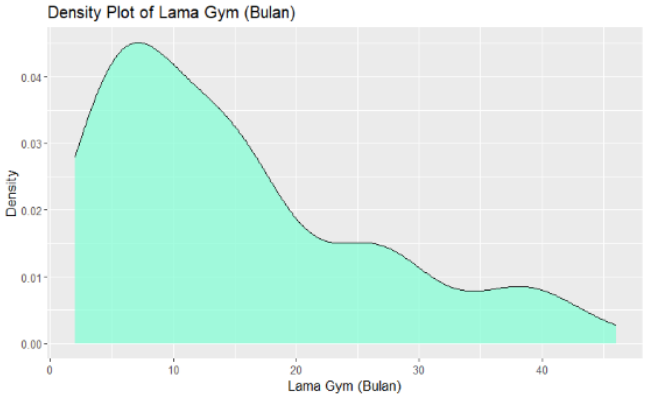


Figure 4.32 Density Plot of Lama Gym

```
        Shapiro-Wilk normality test

data:  data$lamaGymBulan
W = 0.88425, p-value = 2.472e-07

   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   2.00    6.00   13.00   14.99   20.00   46.00
[1] 10.95764
```

Figure 4.33 Shapiro-Wilk test on LamaGymBulan

The density plot above shows a right skewed distribution, which means that most of the data is concentrated in the lower values and there are several outlier values that are higher. Based on the results of the Shapiro-Wilk test on the LamaGymBulan, p-value = 2.472e-07. Because the p-value (2.472e-07) is much smaller than the alpha significance level (0.05), we reject the null hypothesis which states that the data is normally distributed. The Shapiro-Wilk test shows that LamaGymBulan data is not normally distributed.

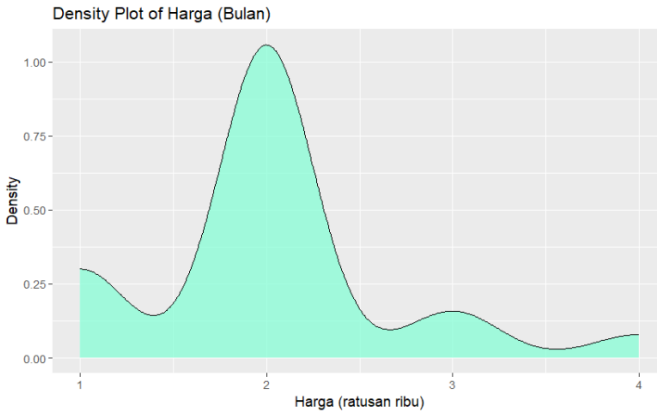


Figure 4.34 Density Plot of Harga Gym

```
        Asymptotic one-sample Kolmogorov-Smirnov test

data:  standardized_data
D = 0.15904, p-value = 0.01208
alternative hypothesis: two-sided
```

Figure 4.35 Kolmogorov-Smirnov test on HargaGym

Based on the results of the Kolmogorov-Smirnov test on the MemberGym price variable, the p-value = 0.01208. Because the p-value (0.01208) is smaller than the alpha significance level (0.05), the null hypothesis which states that the data is normally distributed is rejected. The Kolmogorov-Smirnov test shows that the MemberGym price data is not normally distributed. This can also be seen in the density plot which shows an asymmetrical distribution.

No	Variabel	Test	Results	Normality
1	Umur	Shapiro-Wilk	1.33e	Not normal
2	Semester	Shapiro-Wilk	2.2e-16	Not normal
3	Frekuensi Gym	Shapiro-Wilk	1.079e-06	Not normal
4	Berat Badan	Shapiro-Wilk	0.6798	Normal
5	Tinggi Badan	Shapiro-Wilk	0.1909	Normal
6	Jumlah Mata Kuliah	Shapiro-Wilk	0.0001878	Not normal
7	Jumlah Kegiatan	Shapiro-Wilk	1.668e-09	Not normal
8	DurasiGym	Shapiro-Wilk	1.556e-06	Not normal
9	Jarak Gym	Shapiro-Wilk	1.249e-13	Not normal
10	Lama Gym	Shapiro-Wilk	2.472e-07	Not normal
11	Harga Gym	Kolmogorov-Smirnov	0.01208	Not Normal

Table 4.1 Summary of Normality Testing

C. Hypothesis Testing

```
  0  1  2  3  4  5
2 4  6  4  0  0  0
3 12 11 9  4  0  1
4 8  2  4  1  3  0
5 12 2  3  1  1  0
6 7  1  4  0  0  0
7 0  0  0  1  0  0

Pearson's Chi-squared test

data:  contingency_table
X-squared = 40.038, df = 25, p-value = 0.0289
```

Figure 4.36 Pearson's Chi-Squared test on Hypothesis 1

Hypothesis 1, which assumes a relationship between the business of campus activities and the intensity of visits to the fitness center per week, tested using the Chi-Square test. The Chi-Square test is chosen for hypothesis 1 because the Chi-square test is a statistical method used to test the dependency between two categorical variables in a contingency table, which in this case tests whether the number of activities influences the frequency of students visiting the gym in a week. X-Squared = 40.038 with p-value 0.0289. A small p-value (usually < 0.05) indicates that there is sufficient evidence to reject the null hypothesis (there is no relationship between variables X and Y in the contingency table). In this case, it can be concluded that there is a significant relationship between variables X and Y in the contingency table. This means that the assumption that there is a relationship between busyness in campus and the intensity of visits to the fitness center is correct.

```
Call:
lm(formula = frekuensiGymSeminggu ~ jumlahKegiatan + jumlahMatkul,
    data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-2.5945 -0.8300 -0.3761  1.0608  3.3067

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    4.70371    0.46248  10.171   <2e-16 ***
jumlahKegiatan -0.04555    0.10659  -0.427   0.6700
jumlahMatkul   -0.10922    0.05796  -1.884   0.0625 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.273 on 98 degrees of freedom
Multiple R-squared:  0.03975,   Adjusted R-squared:  0.02015
F-statistic: 2.028 on 2 and 98 DF,  p-value: 0.1371


        Durbin-Watson test

data:  reg_model
DW = 1.6133, p-value = 0.02602
alternative hypothesis: true autocorrelation is greater than 0
```

Figure 4.37 Linear Regression Model Durbin-Watson test on Hypothesis 2

Hypothesis 2, which assumes that there are students who are active in campus and those who are not active in campus, influences the average intensity of visits to the fitness center, tested using the multiple regression test. The reason for choosing the multiple regression test for hypothesis 2 is because the aim is to understand the relationship between one dependent variable and several independent variables simultaneously. In other words, the main goal of multiple regression is to explain and predict the dependent variable based on the given independent variables. The results of the multiple regression test results are that when the number of activities and the number of subjects are zero, the weekly gym frequency is predicted to be around 4.70371 times per week, for every one unit increase in the number of courses, the weekly gym frequency is predicted to decrease by 0.10922 times per week. This coefficient is almost statistically significant with a p-value of around 0.0625 (indicating a significant trend with a 10% confidence level). JumlahMatkul numbers are almost significant and show a trend that increasing the number of courses may reduce the frequency of gym visits.

```
        Pearson's Chi-squared test

data:  contingency_table2
X-squared = 225.63, df = 205, p-value = 0.1541
```

Figure 4.38 Pearson's Chi-square test on Hypothesis 3

Hypothesis 3 uses the chi-square test. Chi-square test is used to test whether there is a relationship between the distance of the gym and the intensity of visits to the fitness center. The resulting P-value is 0.1541. Since the p-value (0.1541) is greater than the alpha significance level (0.05), we fail to reject H0. This means that statistically there is not enough evidence to state that there is a significant difference between the intensity of visits to the fitness center and the distance the gym.

```
            Df Sum Sq Mean Sq F value Pr(>F)
Semester     1   1.02   1.023   0.616  0.434
Residuals   99 164.40   1.661
```

Figure 4.39 ANOVA test on Hypothesis 4

Based on the ANOVA results displayed, the p-value is 0.434. Because the p-value (0.434) is greater than the alpha significance level (usually 0.05), we fail to reject H0. This means that statistically there is not enough evidence to state that the semester of study has a significant influence on the intensity of student visits to the fitness center.

```
             Df Sum Sq Mean Sq F value Pr(>F)
jumlahMatkul  1   6.28   6.279   3.906 0.0509 .
Residuals    99 159.15   1.608
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 4.40 ANOVA test on Hypothesis 5

Based on the ANOVA results displayed, it is written that the p-value is 0.0509. because the result of the p-value is greater than 0.05, we do not have enough evidence to reject H0. Which means the number of courses does not have a significant effect on the frequency of visits to the fitness center.

```
 Welch Two Sample t-test

 frekuensiGymSeminggu by jumlahKegiatan_binary
247, df = 90.393, p-value = 0.02708
ative hypothesis: true difference in means between group 0 and group 1 is not equal to 0
cent confidence interval:
12577 1.07501296
 estimates:
n group 0 mean in group 1
 4.139535        3.568966
```

Figure 4.41 T-test on Hypothesis 6

This test is used to compare the frequency of going to the gym a week and the number of activities. Based on the results of the Welch Two Sample t-test, the p-value is 0.2708. Which means the p-value is greater than 0.05. So it rejects H0 so that the two variables are not related.

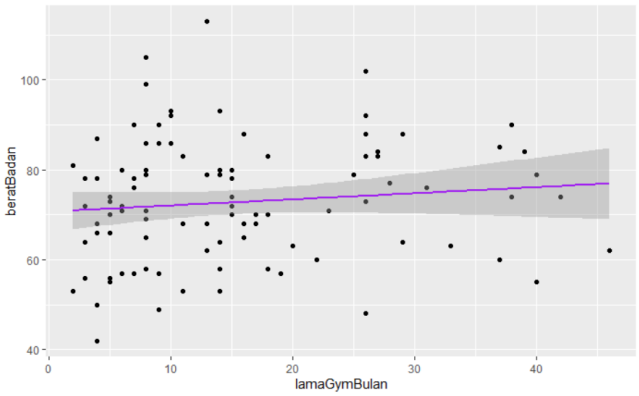


Figure 4.42 Scatter Plot of Hypothesis 7

```
Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)           10.1101     5.7337   1.763   0.0809 .
frekuensiGymSeminggu  -0.9004     1.4260  -0.631   0.5292
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 18.34 on 99 degrees of freedom
Multiple R-squared:  0.004011,  Adjusted R-squared:  -0.006049
F-statistic: 0.3987 on 1 and 99 DF,  p-value: 0.5292


        Durbin-Watson test

data:  reg_model2
DW = 1.5271, p-value = 0.007588
alternative hypothesis: true autocorrelation is greater than 0
```

Figure 4.43 Durbin-Watson test on Hypothesis 7

Based on the code above, the coefficients section shows information about the relationship between the dependent (JarakGym) and independent (JumlahGym) variables. In the multiple R-squared and Adjusted R-squared sections, it provides an estimate for each increase in one unit such as the Gym frequency per week (-0.9004), which is expected to decrease in the gym distance section by 0.9004. There is autocorrelation in the Durbin-Watson test, because the value of Durbin Watson is 1.5271 and if the DW is less than 2, it will show a positive result. However, there is also a p-value of 0.007588, which is less than 0.05. so this rejects H0 that there is no autocorrelation in the residuals. Which means there is no strong evidence that the frequency of going to the gym each week has a significant effect on body weight.

No.	Test	Variable	Results	Notes
1	Chi-square	JumlahKegiatan & JumlahGym	0.0289	Accepted
2	Durbin-Watson	JumlahKegiatan, JumlahMatkul & JumlahGym	0.02602	Accepted
3	Chi-square	JarakGym & JumlahGym	0.1541	Rejected
4	Anova	Semester & JumlahGym	0.434	Rejected
5	Anova	JumlahMatkul & JumlahGym	0.0509	Rejected
6	T-test	JumlahKegiatan & JumlahGyn	0.2708	Rejected
7	Durbin-Watson	BeratBadan & LamaGym	0.007588	Rejected

Table 4.2 Summary of Hypothesis Testing

V. CONCLUSION

This journal investigates various factors affecting the intensity of student visits to the gym. The study concludes that lecture schedules significantly impact gym attendance, with busy lecture periods leading to reduced gym visits. Similarly, participation in lecture organizations and activities also contributes to a decrease in gym attendance. However, the study finds no significant difference in gym visit intensity between active and inactive students in lectures. The semester of study does not significantly influence gym attendance, as shown by the ANOVA test results with a p-value of 0.434. Furthermore, the number of extracurricular activities and courses taken by students do not significantly affect gym visit frequency, with respective p-values of 0.2708 and 0.0509. The study also explores the influence of students' majors on gym attendance and finds that while there is some impact, it is not substantial. Additionally, the distance to the gym is identified as a factor influencing gym visit intensity, suggesting that proximity to the fitness center plays a role in determining how often students exercise. Overall, the research highlights the complex interplay of academic commitments and logistical factors in shaping students' fitness behaviors.

ACKNOWLEDGMENT

We would like to express our sincere gratitude to our esteemed lecturer, Samuel Ady Sanjaya, S.T, M.T, for his guidance and support throughout this project. His encouragement to explore this topic and his valuable insights were instrumental in shaping the direction of our research.

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