Assignment Web Similarity Analysis

Generated on 2025-03-26 05:02:44

Executive Summary

Overall Web Similarity Score: 10%

Assessment: Low overall similarity. The assignment primarily contains code and equations related to control systems, which are not present in the provided web source (a PDF of lecture notes that appears to be encoded binary data, likely the raw file content rather than the text). Some standard terminology related to control systems and root locus analysis might be present in both, but these fall under common engineering knowledge. The assignment's structure (lab report format) is also dissimilar to the provided web source.

Conclusion: The assignment demonstrates original work. The presence of common engineering terms does not indicate plagiarism. The provided web source does not contain content that matches the specific equations, code, or analysis present in the assignment. It is important to note that only one web source was provided for comparison, and a more thorough analysis would require checking against a broader range of potential sources (including textbooks, lecture slides from the student's course, and other online resources) to definitively rule out plagiarism. Furthermore, the supplied PDF content seems to be raw binary data which prevents a proper comparison.

Web Sources Analyzed

Source URL	Similarity Score
https://ocw.mit.edu/courses/2-003-modeling-dynamics-and-control-i-spring-2005/57d44d83366ec969c66208f08fac398	9.0%

Detailed Content Matches

Match 1 - Common Knowledge (100%)

Assignment: Root Locus
Source: None
Source Text: None

Match 2 - Common Knowledge (100%)

Assignment: transfer function
Source: None
Source Text: None

Match 3 - Common Knowledge (100%)

Assignment: natural frequency
Source: None
Source Text: None

Full Assignment with Highlighted Plagiarism

Sections highlighted in yellow with red text indicate potential plagiarism.

EE5351: CONTROL SYSTEM DESIGN

LABORATORY 03

NAME : BANDARA KMTON

REG.NO. : EG/2021/4432

GROUP NO. : CE 07

DATE : 20/01/2024

Summative Laboratory Form

Semester

05

Module Code

EE5351

Module Name

Control Systems Design

Lab Number

03

Lab Name

Laboratory Session 3

Lab Conducted Date

2024.11.05

Report Submission Date

2025.01.24

Table of Contents

Table of Figures

OBSERVATIONS

Question1)

= ++ 1

= 2

= 3

= 4

Considering the above equations t/f Given as:

=

By negliting the rotor inductance (Due to the Small value)

=

=

Figure 1: Simulink for the Question 3

Figure 1: Simulink for the Question 3

To get the closed loop transfer function

Source: None

=

=

Figure 2: Simulink for updated version from Q3

Figure 2: Simulink for updated version from Q3

Figure 3: Time domain response for Q5

Figure 3: Time domain response for Q5

Question2)

Figure 4: Code for Root locus of closed loop

Figure 4: Code for Root locus of closed loop

Figure 5: Root Locus

Source: None

Figure 5: Root Locus

Source: None

By considering the characteristic equation

2 =

= 10.045

```
clc; clear; close all;
%% Define the Open-Loop Transfer Function for DC Motor Position Control
numerator = [0.042]; % System gain
denominator = [17.556e-5, 1.764e-3, 0.042]; % Denominator coefficients
G = tf(numerator, denominator);
%% Plot the Root Locus of the Open-Loop System
```

Source: None

```
figure;
rlocus(G);
title('Root Locus of DC Motor Position Control System');
```

Source: None

```
grid on;
%% Increase Natural Frequency by 10%
omega_n = 10.045; % Current natural frequency (example value)
```

Source: None

omega_n_new = 1.1 * omega_n; % New desired natural frequency (increase by 10%)

Source: None

% Now, we will modify the system to achieve the new natural frequency.

Source: None

% We need to adjust the parameters of the system such that the new ωn is achieved.

% Adjust the denominator to increase ωn by 10%

denominator_new = denominator;

denominator_new(1) = denominator_new(1) * (omega_n_new / omega_n); % Adjust the first denominator term to scale with ωn

% Create the new transfer function

Source: None

G_new = tf(numerator, denominator_new);

%% Plot the Root Locus of the Modified System

Source: None

figure;

rlocus(G_new);

title('Root Locus After Increasing Natural Frequency by 10%');

Source: None

grid on;

Figure 6: Root Locus after increasing Omega

Source: None

Figure 6: Root Locus after increasing Omega

Source: None

clc; clear; close all;

%% Define the Open-Loop Transfer Function for DC Motor Position Control

numerator = [0.042]; % System gain

denominator = [17.556e-5, 1.764e-3, 0.042]; % Denominator coefficients

G = tf(numerator, denominator);

%% Plot the Root Locus of the Open-Loop System

Source: None

figure;

rlocus(G);

title('Root Locus of DC Motor Position Control System');

Source: None

grid on;

%% Increase Natural Frequency by 10%

omega_n = 10.045; % Current natural frequency (example value)

Source: None

omega_n_new = 1.1 * omega_n; % New desired natural frequency (increase by 10%)

Source: None

% Now, we will modify the system to achieve the new natural frequency.

Source: None

% We need to adjust the parameters of the system such that the new ωn is achieved.

% Adjust the denominator to increase ωn by 10%

denominator_new = denominator;

denominator_new(1) = denominator_new(1) * (omega_n_new / omega_n); % Adjust the first denominator term to scale with ωn

% Create the new transfer function

Source: None

G_new = tf(numerator, denominator_new);
%% Plot the Root Locus of the Modified System
Source: None
figure;
rlocus(G_new);
title('Root Locus After Increasing Natural Frequency by 10%');
Source: None
grid on;
% Calculate and plot the time response of both systems
figure;
step(G, 'b', G_new, 'r'); % Original in blue, Modified in red
title('Comparison of Time Responses: Original vs Modified System');
legend('Original System', 'Modified System');
grid on;
Figure 7: Comparison of the time responses
Figure 7: Comparison of the time responses
Question3)
Figure 8:Designing Comapesator
Figure 8:Designing Comapesator1.
2.
Figure 9: Time domain response [θm(t)] of the closed loop position control system of DC motor
Figure 9: Time domain response [θm(t)] of the closed loop position control system of DC motor
References
[1]
“Tutorials Point,” [Online]. Available: https://www.tutorialspoint.com/control_systems/control_systems_construction_root_locus.htm.
[2]
“Mathwworks,” [Online]. Available: https://in.mathworks.com/help/control/ref/dynamicsystem.rlocus.html.
[3]
[Online]. Available: https://www.geeksforgeeks.org/control-systems-controllers/.

Analysis Methodology

Web Similarity Analysis Method: This report analyzes the similarity between a student assignment and web content using multiple approaches:

1. **Basic similarity analysis** using TF-IDF vectorization and cosine similarity metrics to calculate statistical similarity between texts.

2. **Advanced semantic analysis** using Google's Gemini AI to identify conceptual similarities, common phrases, and potential plagiarism patterns.

3. **Source verification** by analyzing multiple sources to distinguish between common knowledge and unique content.

Interpretation Guide:

• 0-15%: Very low similarity - Likely original content

• 16-30%: Low similarity - Contains common phrases but largely original

• 31-50%: Moderate similarity - May contain some paraphrased content

• 51-70%: High similarity - Contains substantial similar content

• 71-100%: Very high similarity - Significant portions may be unoriginal

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Disclaimer: This automated similarity analysis provides an approximation of content similarity against web sources. Results should be interpreted by a human reviewer for context-appropriate assessment. Common knowledge, standard phrases, and coincidental matches may be flagged and require human judgment.