Assignment Web Similarity Analysis

Generated on 2025-03-26 05:01:06

Executive Summary

Overall Web Similarity Score: 50%

Assessment: ```json { "overall_similarity_score": 15, "similarity_assessment": "Low overall similarity. Some small code snippets and general concepts related to control systems and root locus analysis appear in both the assignment and online resources, but the specific application and analysis within the assignment appear unique.", "detailed_matches": [{ "assignment_text": "Root Locus", "source_url": null, "source_text": null, "similarity": 100, "match_type": "Commo

Conclusion: o apply standard techniques (like root locus analysis) to specific problems. The originality lies in the application and analysis, not the underlying methods. * **Conclusion of No Plagiarism:** The assignment demonstrates original work by applying control system principles to a specific problem. The presence of standard terms, commands, and general concepts does not constitute plagiarism. A more definitive conclusion about Source 1 would require a textual version of the PDF for comparison.

Web Sources Analyzed

Source URL	Similarity Score
https://ocw.mit.edu/courses/2-003-modeling-dynamics-and-control-i-spring-2005[illegible]	[illegible]

Detailed Content Matches

No specific content matches were identified.

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

=

=

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

Figure 5: Root Locus

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
figure;
rlocus(G);
title('Root Locus of DC Motor Position Control System');
grid on;
%% Increase Natural Frequency by 10%
omega_n = 10.045; % Current natural frequency (example value)
omega_n_new = 1.1 * omega_n; % New desired natural frequency (increase by 10%)
% Now, we will modify the system to achieve the new natural frequency.
% 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
G_new = tf(numerator, denominator_new);
%% Plot the Root Locus of the Modified System
figure;
rlocus(G_new);
title('Root Locus After Increasing Natural Frequency by 10%');
grid on;
```

Figure 6: Root Locus after increasing Omega

Figure 6: Root Locus after increasing Omega

```
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
figure;
rlocus(G);
title('Root Locus of DC Motor Position Control System');
grid on;
%% Increase Natural Frequency by 10%
omega_n = 10.045; % Current natural frequency (example value)
omega_n_new = 1.1 * omega_n; % New desired natural frequency (increase by 10%)
% Now, we will modify the system to achieve the new natural frequency.
% 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
G_new = tf(numerator, denominator_new);
%% Plot the Root Locus of the Modified System
figure;
rlocus(G_new);
title('Root Locus After Increasing Natural Frequency by 10%');
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.