Welcome

Dear participant,

Thank you for participating in our study on model explanations. We are very grateful for your participation and your invaluable insight. Please read this Explanatory Statement in full before moving forward. If you would like further information regarding any aspect of this project, please contact us via the email address provided below.

We are a group of researchers from the [redacted] dedicated to improving education through technology. **The goal of this study is to evaluate different explanations to help a student improve their performance in an online course.**

- This survey has been approved by the [redacted] under application number [redacted]. HREC reviews research proposals involving human participants to ensure that they are ethically acceptable.

- All the personal information will be kept confidential and anonymized. Only demographic information is being recorded and will only be reported as aggregate in a way that prevents identification of any individual participant. You can freely withdraw at any time and any collected data you provided so far will be destroyed.

- All data will be collected and stored safely and reported in an anonymous form, in accordance with the [redacted].

- Only anonymized or aggregated data may be used in follow-up research (subject to ethics approval), and made available to other researchers for further analysis and for verification of the conclusions reached by the research team.

- Only the principal investigator and the aforementioned researchers have access to the original data under strict confidentiality. Results from the project may be published in conference papers and/or journal articles. In any case, no personal data will be published (only aggregated, anonymous and/or anonymized data will be published).

- Personal data of participants will be stored for 5 years from the date of collection. During this time, participants have the right to access

their data and request information about the processing of their personal data. In order to exercise this right, you need to contact the Principal Investigator.

By participating in this survey, you agree that your data can be used for scientific purposes.

In the following study, you will be asked to compare explanations for approximately 20 minutes. Please ensure that you have enough time to finish the study correctly. Unfinished or only partially answered studies will not be considered as finished.

We ask you to approach the questions and exercises with seriousness and to complete them to the best of your ability. We will subsequently check questionnaires for seriousness and will have to discard questionnaires that do not meet this requirement.

Thank you for your help. If you encounter any problem with the survey, or if you want to give extra feedback, or receive additional information, feel free to contact us [redacted].

Agreement

I understand the purpose and nature of this task and would like to begin now.

Intro

You are a student taking three online courses (MOOCs): Digital Signal Processing, African Cities, and Elements of Geometry. Since the courses are difficult, often with low passing rates, the teaching team wants to help students who are not doing well to perform better in the course by giving them personalized assistance, and encourage students who are already performing well to continue.

To do this, we have a very good model (over 90% accurate) to predict students' success or failure using various weekly behavior features (such as number of video clicks or how accurately questions are answered on the weekly quizzes). We predict student performance early in the course (before the half-way point) as passing or failing behavior. We use the explanation of the prediction to give students additional, **personalized feedback** to help pass the course.

We want to compare these **personalized feedback explanations** according to several criteria:

- **Usefulness**: This explanation is useful to understand the prediction based on my learning behavior.
- **Trustworthiness**: This explanation lets me judge if I should trust the suggestions.
- **Actionability**: This explanation helps me make a decision on how to improve my learning behavior.
- **Completeness**: This explanation has sufficient detail to understand why the prediction was made based on my learning behavior.
- **Conciseness**: Every detail of this explanation is necessary.

We will first do a practice example.

Example

In the following questions, we will ask you to rank some explanations according to different criteria.

In this example, we ask you to rank Explanation 1 and Explanation 2 according to Criteria 1 and Criteria 2.

Practice Example

Select score 5 (highest) for Explanation 1 on Criteria 1.
Select score 1 (lowest) for Explanation 2 on Criteria 1.
This indicates that Explanation 1 is better than Explanation 2 at Criteria 1.

Select score 3 (middle) for Explanation 1 on Criteria 2.
Select score 3 (middle) for Explanation 2 on Criteria 2.
This indicates Explanation 1 and Explanation 2 are equally performing at Criteria 2.

The Likert scale choices represent the following:
1 - Completely disagree
2 - Somewhat disagree
3 - Neither agree nor disagree

4 - Somewhat agree
5 - Completely agree

	EXP 1					EXP 2				
	1	2	3	4	5	1	2	3	4	5
Criterion 1	○	○	○	○	○	○	○	○	○	○
Criterion 2	○	○	○	○	○	○	○	○	○	○

Demographics

What is your Prolific ID?

How do you describe yourself?

- Male
- Female
- Non-binary / third gender
- Prefer to self-describe
- Prefer not to say

How old are you?

- Under 18
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65+ years old

What is the highest level of education you have completed?

- Some high school or less
- High school diploma or GED
- Some college, but no degree

Associates or technical degree

Bachelor's degree

Graduate or professional degree (MA, MS, MBA, PhD, JD, MD, DDS etc.)

Prefer not to say

Have you ever taken an online course (MOOC)?

Yes

No

Have you ever struggled in a course?

Never

Rarely

Sometimes

Often

Always

Student 1a

Digital Signal Processing
(Course 1/3, Explanations 1/2)

--- Explanation 1 ---

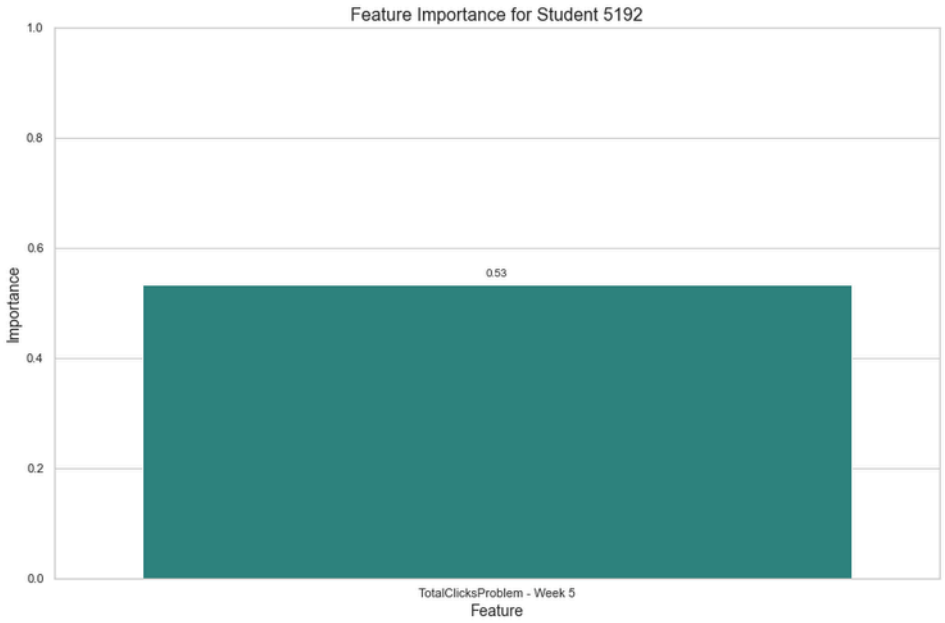
This student is predicted to fail the course with likelihood 99.75%. The model's explanation is determined by finding the smallest number of changes necessary to change a prediction from student failure to student success (or vice versa). The outputs are the sets of features with the new values that would change the prediction. The model found the following features to be the most important for this student:

Top Contributing Features:
TotalClicksProblem: The number of clicks that a student has made on problems this week.

Minimal Counterfactual:
TotalClicksProblem in Week 5: 0.451

The top feature-weeks found important are described in the plot. Improving on these behaviors could lead to stronger performance in

the course.



--- Explanation 2 ---

Student Performance Feedback: Digital Signal Processing 1

You are on track to pass the course, but there are some areas where you can improve to ensure a strong finish.

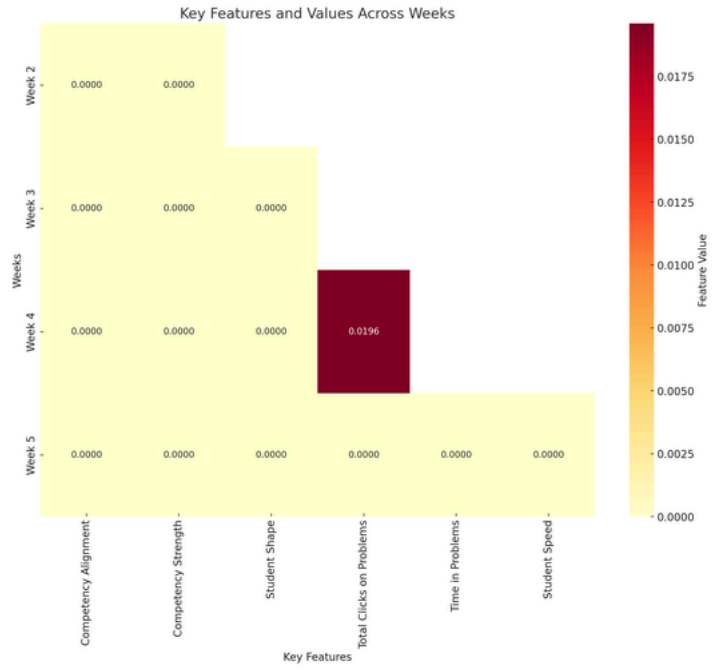
Where Am I Going?
Your goal is to master the Digital Signal Processing 1 course by the end of Week 10. This includes understanding and applying concepts from digital signals to real-time processing and filter design.

How Am I Doing?
- *Relevant Causes*: Your engagement with problem-solving activities (competency alignment) in Weeks 4 and 5 is critical. However, you did not pass any problems during these weeks.
- *New Information*: Assuming you know your quiz performance, it's important to note that your quiz competency strength was suboptimal in Week 5. Additionally, your study sessions in Week 5 lacked regularity, which affected your overall performance.
- *Focus*: The most relevant causes are your competency alignment and strength in Weeks 4 and 5, and the regularity of your study sessions. These are crucial because they directly impact your understanding and application of the course material.

Where to Next?
1. *Weeks 6 and Beyond*: Increase your engagement with problem-solving activities. Focus on solving problems related to filter design

and real-time processing to improve your competency alignment.
2. *Improve Regularity:* Establish a consistent study schedule. Regular study sessions will help you better retain information and improve your competency strength in upcoming quizzes and problem sets.

By focusing on these areas, you can enhance your understanding and performance in the course.



---Explanation 3---

Student Performance Feedback: Digital Signal Processing 1

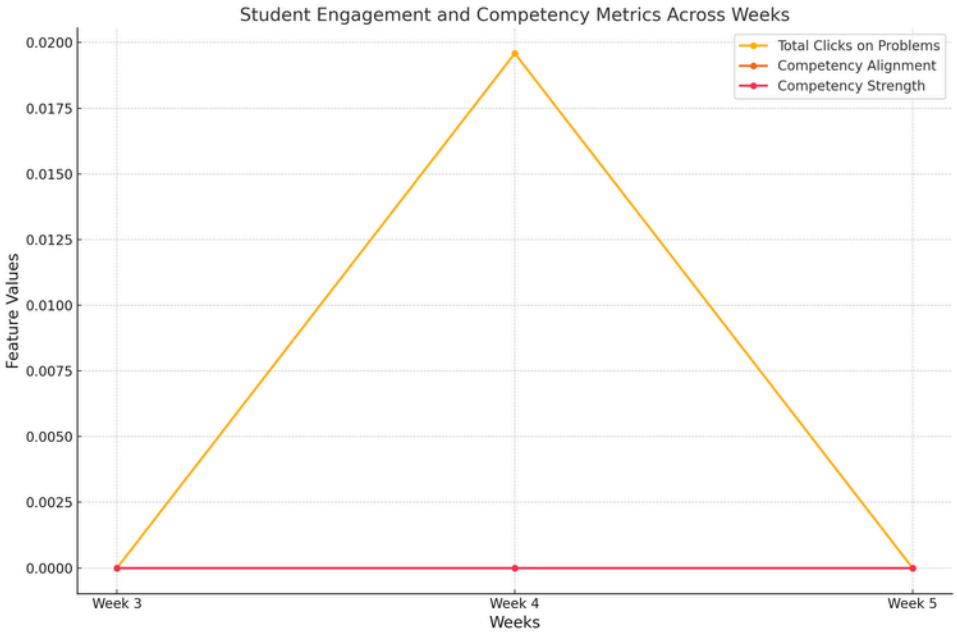
Your performance so far indicates that you are on track, but there are key areas that need attention to ensure success in the course.

Where Am I Going?
Your goal is to pass the Digital Signal Processing 1 course by mastering the skills and topics covered each week, particularly focusing on problem-solving and quiz performance.

How Am I Doing?
- *Abnormal Causes*: You did not solve problems in Weeks 4 and 5, which is unusual and important because problem-solving is crucial for understanding the material.
- *Recent Events*: In Week 5, your engagement with problems was low, and your quiz performance was below expectations. This is critical as Week 5 covers essential filter design skills.
- *Controllable Factors*: You can control your engagement with problem sets and quizzes. Focus on solving more problems and aim for higher quiz scores. Establish a consistent study schedule to enhance

regularity.

Where to Next?
1. *Weeks 6-7*: Increase your problem-solving activities. Week 6 introduces continuous-time signals, and Week 7 covers stochastic signal processing. These topics build on your understanding from Weeks 4-5.
2. *Week 8*: Revisit Week 4 topics (DFT, DTFT) with additional context. Engage deeply with image processing and frequency analysis to reinforce your learning and improve quiz performance.



---Explanation 4---

Feedback on Your Performance in Digital Signal Processing 1

You've been doing well, but there's room for improvement. Your learning goal is to enhance your problem-solving skills and consistency in engaging with course materials.

How Am I Doing?

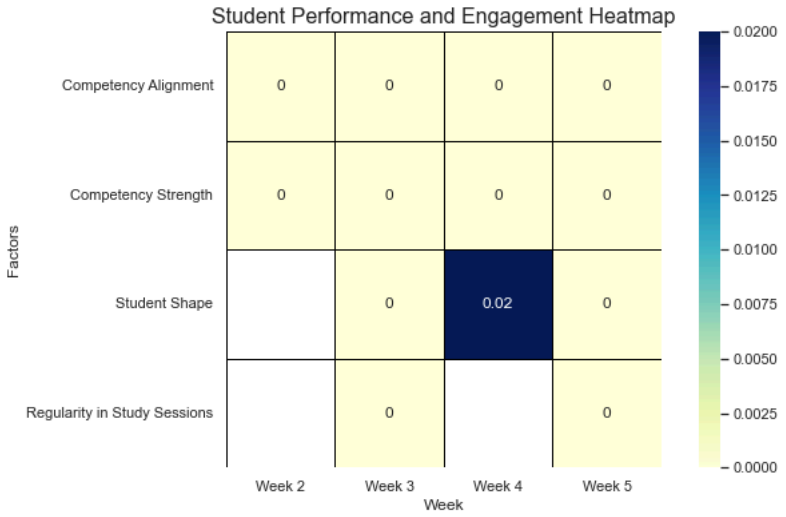
Necessary Causes:
1. **Competency Alignment (Weeks 4 & 5):** You didn't pass any problems in these weeks. This is essential because aligning your problem-solving efforts with course expectations can significantly impact your understanding and performance.
2. **Competency Strength (Week 5):** Your quiz performance was lower than needed. Strong quiz results are crucial for reinforcing your knowledge.

Robust Explanation:

1. **Student Shape (Week 3):** Achieving maximum quiz grades on the first attempt was noted but not achieved. This pattern, if improved, will reliably boost your performance.
2. **Regularity in Study Sessions (Week 5):** Establishing a consistent study schedule is important. Irregular study times can disrupt learning continuity.

Where to Next?

1. **Weeks 6 & 7:** Focus on solving more problems and engaging with the continuous-time paradigm and multirate topics. This will help build a stronger foundation for the remaining course content.
2. **Weeks 8 & 9:** Aim to improve your quiz performance by revisiting and practicing the topics from Weeks 4 and 5, especially on DFT and filter design. This will prepare you for the advanced topics and assessments ahead.



Which explanation do you prefer the most?

Why do you prefer this explanation?

What is the main action you would you take in the next week based on your preferred explanation?

I would improve my regularity of learning on the platform (have a daily or weekly schedule).

I would watch video lectures immediately when they are released

I would attempt more problems.

I would spend more time on the platform.

I would watch more videos.

I would engage more heavily with videos (pausing, replaying, rewinding)

I would practice more for the quiz so I could solve it in fewer attempts.

I would try to attempt quizzes for the next weeks earlier.

I would try to solve the quizzes faster.

I would try to watch videos for the next weeks earlier.

For this action, which weeks of material would you focus on? (Select minimum 1 week and maximum 3 weeks to focus on)

Review Week 1 (Intro, Digital Signals)	Review Week 2 (Digital Signals)	Review Week 3 (Hilbert, Linear Algebra)	Review Week 4 (DFT, DTFT DFS, DTFT: intuition and properties, FFT)	Review Week 5 (Ideal Filters, Filter Design)	Engage in upcoming Week 6 (Modulation, Interpolation & Sampling)	Engage in upcoming Week 7 (Multirate)	Engage in upcoming Week 8 (DFT, DTFT DFS, Ideal Filters)	(C
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How would you grade each explanation?

A score of 1 is the lowest for each criteria, a score of 5 is the highest for each criteria. You can select multiple explanations for each score.

- **Usefulness**: This explanation is useful to understand the prediction based on my learning behavior.
- **Trustworthiness**: This explanation lets me judge if I should trust the suggestions.
- **Actionability**: This explanation helps me make a decision on how to improve my learning behavior.
- **Completeness**: This explanation has sufficient detail to understand why the prediction was made based on my learning behavior.
- **Conciseness**: Every detail of this explanation is necessary.

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Usefulness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trustworthiness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Actionability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completeness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Conciseness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Student 1b

Digital Signal Processing
(Course 1/3, Explanations 2/2)

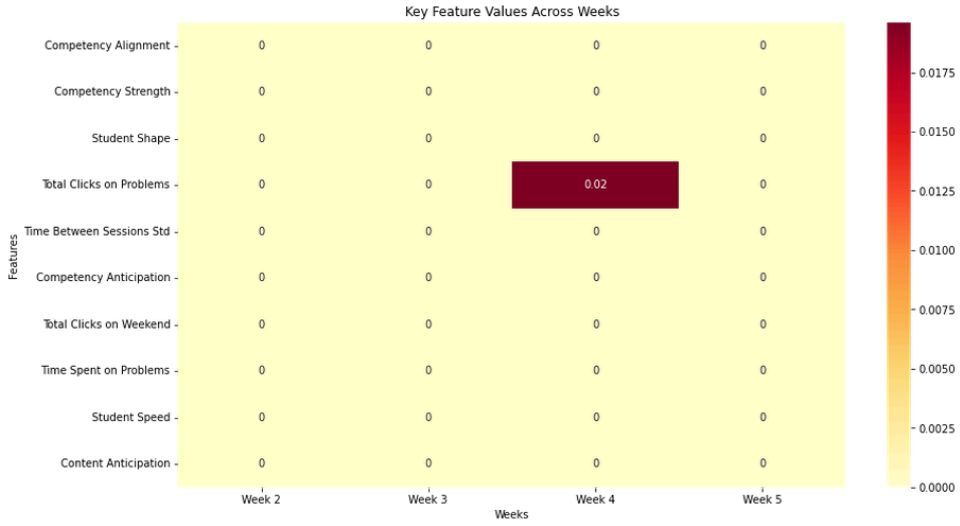
---Explanation 1---

Feedback Report: Digital Signal Processing 1

Your performance so far shows potential, but there are specific areas that need attention to ensure you pass the course. The learning goal is to enhance your problem-solving skills and engagement with the course material.

In Week 5, you didn't pass any problems, which is crucial for your competency alignment. Similarly, in Week 4, you also didn't pass any problems, indicating a need for more focus on problem-solving. Your quiz performance in Week 5 was below expectations, impacting your overall competency strength. Additionally, you haven't engaged in anticipatory learning behaviors, such as reviewing upcoming quizzes and content, in Weeks 2, 3, 4, and 5.

To improve, focus on solving more problems in Weeks 6 and 7. This will help you align better with the course expectations. Additionally, engage with upcoming content and quizzes to build a stronger foundation for the remaining weeks. Establishing a consistent study routine will also be beneficial.



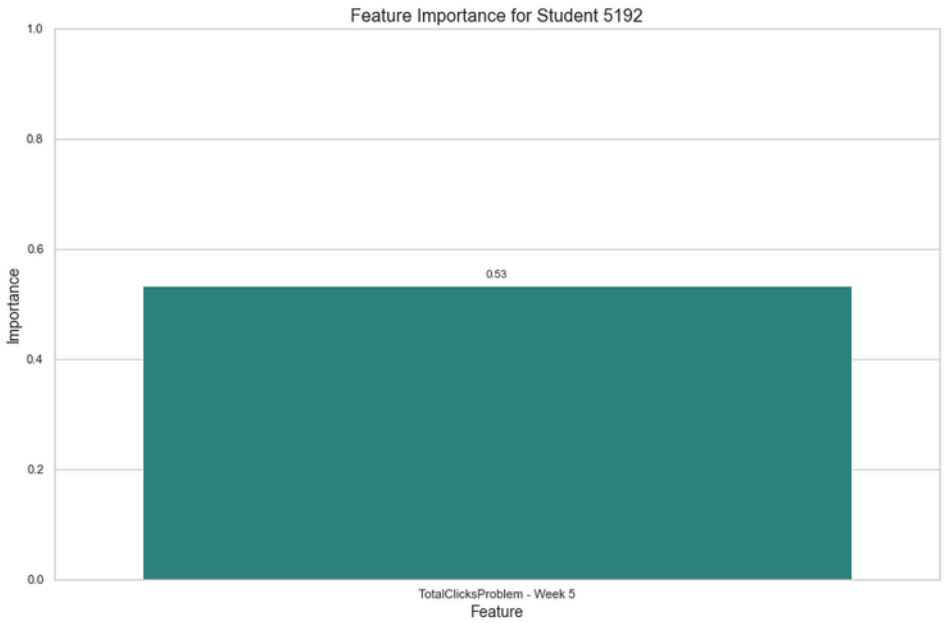
---Explanation 2---

This student is predicted to fail the course with likelihood 99.75%. The model's explanation is determined by finding the smallest number of changes necessary to change a prediction from student failure to student success (or vice versa). The outputs are the sets of features with the new values that would change the prediction. The model found the following features to be the most important for this student:

Top Contributing Features:
TotalClicksProblem: The number of clicks that a student has made on problems this week.

Minimal Counterfactual:
TotalClicksProblem in Week 5: 0.451

The top feature-weeks found important are described in the plot. Improving on these behaviors could lead to stronger performance in the course.



---Explanation 3---

Feedback Report: Digital Signal Processing 1

You've shown potential in this course, but there are specific areas where you can improve to ensure success. The goal is to enhance your understanding and performance in problem-solving and quizzes.

How Am I Doing?

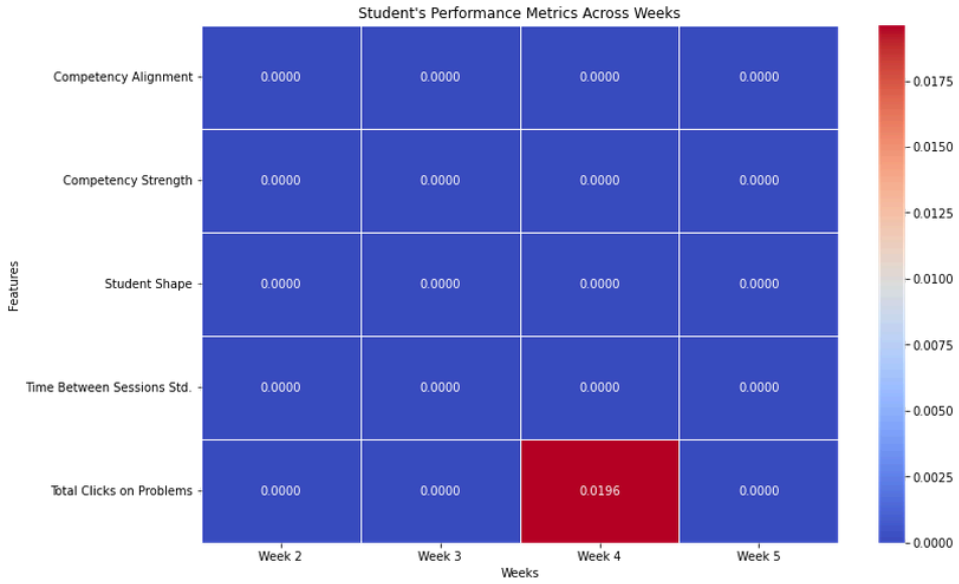
External Factors:
1. **Competency Alignment:** You didn't pass any problems in Weeks 4 and 5. This indicates a need to align your problem-solving efforts with the course requirements.
2. **Time Between Sessions:** In Week 5, your study sessions were irregular. Consistency in study habits is crucial for steady progress.

Internal Relationships:
1. **Competency Strength:** Your quiz performance in Week 5 was below optimal. This directly impacts your understanding and retention of course material.
2. **Total Clicks on Problems:** Low engagement with problem sets in Weeks 4 and 5 suggests you may not be practicing enough, which is vital for mastering the concepts.

Focus on Improvement:
1. **Problem-Solving:** Increase your engagement with problem sets, especially focusing on Weeks 4 and 5 content. This will help you better understand and apply the concepts.
2. **Regular Study Routine:** Establish a consistent study schedule to improve regularity. This will help you retain information better and

prepare for quizzes effectively.

By focusing on these areas, you can improve your performance and deepen your understanding of the course material.



---Explanation 4---

Student Progress Feedback: Digital Signal Processing 1

You've shown promising engagement, but there are areas where you can improve to reach your goal of mastering Digital Signal Processing.

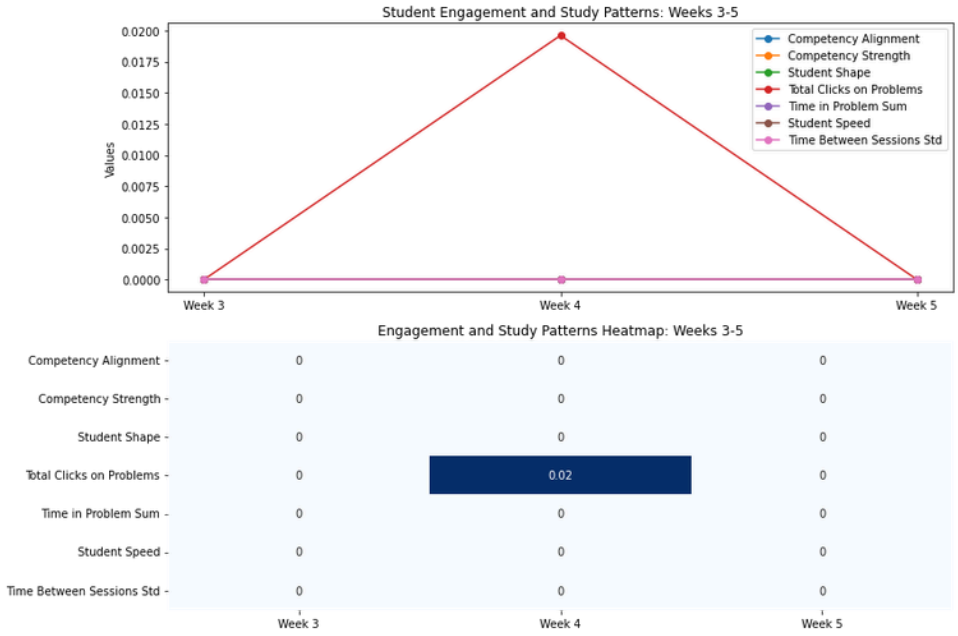
Where Am I Going?
Your learning goal is to successfully pass the course by increasing your problem-solving skills and consistency in study habits.

How Am I Doing?
- ***Target Event:*** During Week 5, you didn't pass any problems (competency alignment) and had low engagement with problem-solving activities.
- ***Contrast Event:*** Ideally, you would have passed several problems and engaged more with the problem sets.
- ***Key Differences:*** The main difference is the level of problem-solving engagement. Passing problems shows understanding and application of concepts, which you need to improve on.

Where to Next?
1. ***Week 6 Focus:*** Increase your engagement with Week 6 content on Modulation, Interpolation, and Sampling. Actively solve problems and anticipate quizzes to better prepare.
2. ***Week 7 Preparation:*** Establish a consistent study schedule and regularly review Week 7 content on Multirate processing. This will help

you build a strong foundation and improve your competency alignment.

By addressing these areas, you can enhance your learning trajectory and improve your performance in the course.



Which explanation do you prefer the most?

Why do you prefer this explanation?

What is the main action you would you take in the next week based on your preferred explanation?

- I would improve my regularity of learning on the platform (have a daily or weekly schedule).
- I would watch video lectures immediately when they are released
- I would attempt more problems.
- I would spend more time on the platform.
- I would watch more videos.
- I would engage more heavily with videos (pausing, replaying, rewinding)
- I would practice more for the quiz so I could solve it in fewer attempts.

I would try to attempt quizzes for the next weeks earlier.

I would try to solve the quizzes faster.

I would try to watch videos for the next weeks earlier.

For this action, which weeks of material would you focus on? (Select minimum 1 week and maximum 3 weeks to focus on)

Review Week 1 (Intro, Digital Signals)	Review Week 2 (Digital Signals)	Review Week 3 (Hilbert, Linear Algebra)	Review Week 4 (DFT, DTFT DFS, DTFT: intuition and properties, FFT)	Review Week 5 (Ideal Filters, Filter Design)	Engage in upcoming Week 6 (Modulation, Interpolation & Sampling)	Engage in upcoming Week 7 (Multirate)	Engage in upcoming Week 8 (DFT, DTFT DFS, Ideal Filters)	(C
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How would you grade each explanation?

A score of 1 is the lowest for each criteria, a score of 5 is the highest for each criteria. You can select multiple explanations for each score.

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Usefulness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trustworthiness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Actionability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completeness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Conciseness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Student 2a

African Cities
(Course 2/3, Explanations 1/2)

---Explanation 1---

Feedback on Your Course Performance

You've been struggling with the course "Villes africaines I: Introduction a la planification urbaine." Our goal is to help you pass by the end of the term.

How Am I Doing?

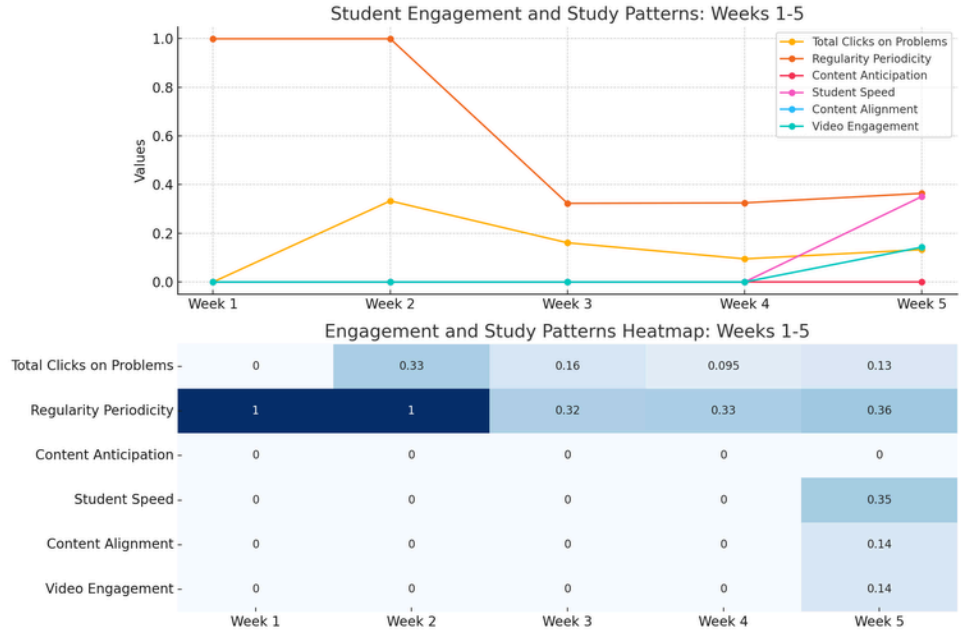
Your engagement with problem-solving activities has been very low. For instance, in Weeks 2, 3, 4, and 5, you had no clicks on problems. Also, your study patterns have been inconsistent, and you haven't been watching the video lectures or engaging with the course content.

Where to Next?

1. **Focus on Problem-Solving Activities (Weeks 6-7):** Start participating in problem-solving activities. For example, in Week 6, try to engage with quizzes and problems related to "Urban agriculture" and "Climate change." This will help reinforce your understanding of the material.

2. **Develop Regular Study Habits (Weeks 8-9):** Establish a consistent study routine. In Week 8, make sure to watch all the videos on "Basic principles of subdivisions" and "Making networks profitable." This will prepare you for the more complex topics in Week 9, like "Precarious neighborhoods: restructuring."

By focusing on these actions, you'll improve your understanding and performance in the course.



---Explanation 2---

Your performance so far indicates that you are struggling to keep up with the course. The goal is to ensure you understand and engage with the course content to pass successfully.

How Am I Doing?

Necessary Causes:
- ***Engagement with Problem-Solving Activities*:** You have not interacted with problem-solving activities in Weeks 2, 3, 4, and 5. These activities are crucial for reinforcing your understanding of the material.
- ***Regularity in Study Patterns:*** Your study habits lack consistency, which is essential for retaining and comprehending the course content.

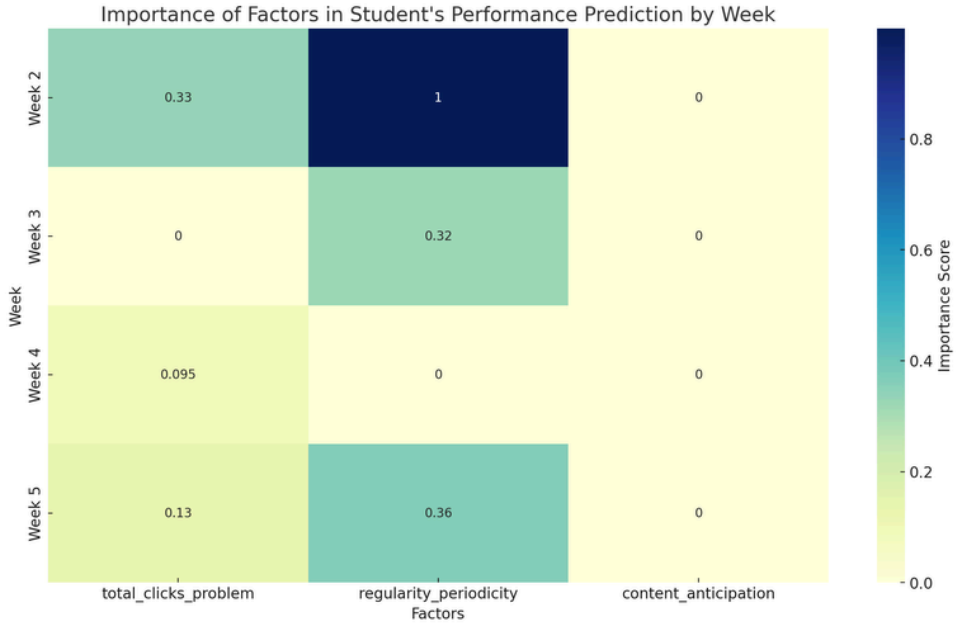
Robust Explanation:
- ***Content Interaction:*** You have not watched or engaged with the video lectures, especially in Week 5. Videos are a primary medium for instruction in this course, and not watching them significantly hampers your learning.
- ***Quiz Attempts:*** You have not attempted quizzes in Weeks 4 and 5. Quizzes help you assess your understanding and identify areas needing improvement.

Where to Next?

1. Engage with Problem-Solving Activities:
  - In Week 6, focus on the quiz and problem-solving activities related to "Critical reading" and "The 10 basic principles." This will help

reinforce your understanding of the key concepts.

2. Establish a Regular Study Schedule:
- For Week 7, set a consistent time each day to engage with the topics on "Tools of urban planning" and "GIS." Regular study patterns will help you retain information better and prepare for the upcoming quizzes.



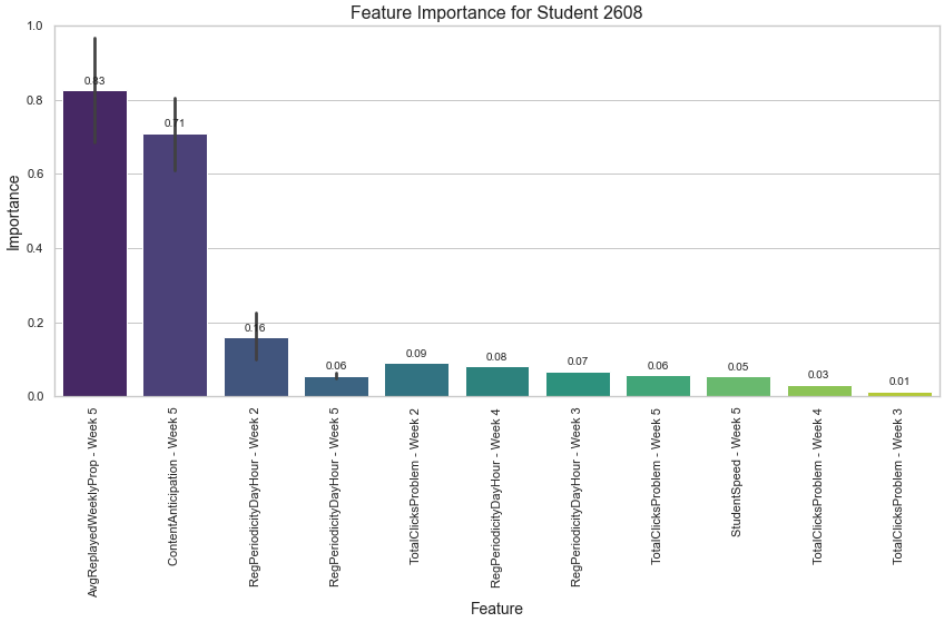
---Explanation 3---

This student is predicted to pass the course with likelihood 60.19%. The model's explanation is determined by finding the smallest number of changes necessary to change a prediction from student failure to student success (or vice versa). The outputs are the sets of features with the new values that would change the prediction. The model found the following features to be the most important for this student:

Top Contributing Features:
TotalClicksProblem: The number of clicks that a student has made on problems this week.
RegPeriodicityDayHour: The extent to which the hourly pattern of user's activities repeats over days.
ContentAnticipation: The number of videos covered by the student from those that are in subsequent weeks.
StudentSpeed: The average time passed between two consecutive attempts for the same quiz.
AvgReplayedWeeklyProp: The ratio of videos replayed over the number of videos available.

Minimal Counterfactual:
TotalClicksProblem in Week 5: 0.058
TotalClicksProblem in Week 4: 0.032
RegPeriodicityDayHour in Week 5: 0.048

The top feature-weeks found important are described in the plot. Improving on these behaviors could lead to stronger performance in the course.



---Explanation 4---

Your current performance suggests that there are several areas where you can improve to better align with the course goals.

How Am I Doing?
External Factors:
- **Engagement with Problem-Solving Activities:** You have not engaged with problem-solving activities in Weeks 2, 3, 4, and 5. These activities are crucial for grasping course concepts.
- **Video Interaction**: There's a lack of interaction with video lectures in Week 5, which are essential for understanding the material.

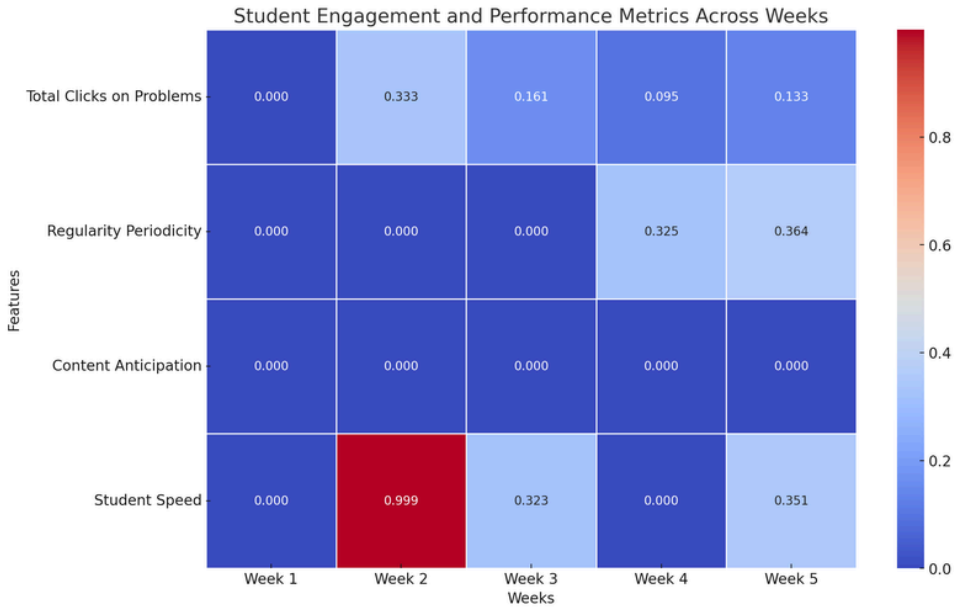
Internal Relationships:
- **Regularity and Periodicity of Study Patterns:** Your study habits are inconsistent across Weeks 3, 4, and 5. Regular study patterns help reinforce learning and improve retention.
- **Content Alignment and Anticipation**: You haven't kept up with the current week's content or previewed upcoming material. This is important for staying on track.

Focus on Improvement:

- **Problem-Solving Activities**: Engage more with problem-solving activities to enhance your understanding of the material.
- **Video Lectures**: Increase your interaction with video lectures to better grasp course concepts.

Where to Next?

1. *Weeks 6 & 7*: Focus on the upcoming quizzes and ensure you actively participate in problem-solving activities. This will help you apply what you've learned and identify areas for improvement.
2. *Weeks 4 & 5*: Revisit the video lectures and content from these weeks. Make sure you understand the material as it will build a strong foundation for the topics in the following weeks.



Which explanation do you prefer the most?

Why do you prefer this explanation?

What is the main action you would you take in the next week based on your preferred explanation?

I would improve my regularity of learning on the platform (have a daily or weekly schedule).

I would watch video lectures immediately when they are released

I would attempt more problems.

I would spend more time on the platform.

I would watch more videos.

I would engage more heavily with videos (pausing, replaying, rewinding)

I would practice more for the quiz so I could solve it in fewer attempts.

I would try to attempt quizzes for the next weeks earlier.

I would try to solve the quizzes faster.

I would try to watch videos for the next weeks earlier.

For this action, which weeks of material would you focus on? (Select minimum 1 week and maximum 3 weeks to focus on)

Review Week 1 (Intro, Urban Planning, African Cities)	Review Week 2 (Stakes and Challenges, Which model for which city)	Review Week 3 (Globalization and Cities, Climate Change, Transport)	Review Week 4 (Urban Facilities, Public Spaces)	Review Week 5 (Urban Sprawl, Professions, Informal settlements)	Engage in upcoming Week 6 (Critical Reading, 10 basic principles, Urban Agriculture)	Engage in upcoming Week 7 (Tools of urban planning, GIS)	(
☐	☐	☐	☐	☐	☐	☐	

How would you grade each explanation?

A score of 1 is the lowest for each criteria, a score of 5 is the highest for each criteria. You can select multiple explanations for each score.

- **Usefulness**: This explanation is useful to understand the prediction based on my learning behavior.
- **Trustworthiness**: This explanation lets me judge if I should trust the suggestions.
- **Actionability**: This explanation helps me make a decision on how to improve my learning behavior.
- **Completeness**: This explanation has sufficient detail to understand why the prediction was made based on my learning behavior.
- **Conciseness**: Every detail of this explanation is necessary.

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Usefulness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trustworthiness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Actionability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completeness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Student 2b

African Cities
(Course 2/3, Explanations 2/2)

---Explanation 1---

Feedback on Your Performance

You've been struggling with the course so far, and we need to focus on some key areas to help you improve. The main goal is for you to pass the course by better engaging with the material and developing consistent study habits.

How Am I Doing?

Relevant Causes:
1. *Engagement with Problem-Solving Activities*: You haven't interacted with problem-solving activities in Weeks 2, 3, 4, and 5.
2. *Regularity and Periodicity of Study Patterns*: Your study patterns have been inconsistent in Weeks 3, 4, and 5.
3. *Content Alignment and Anticipation:* You haven't been keeping up with or previewing course content in Weeks 1, 2, 3, 4, and 5.

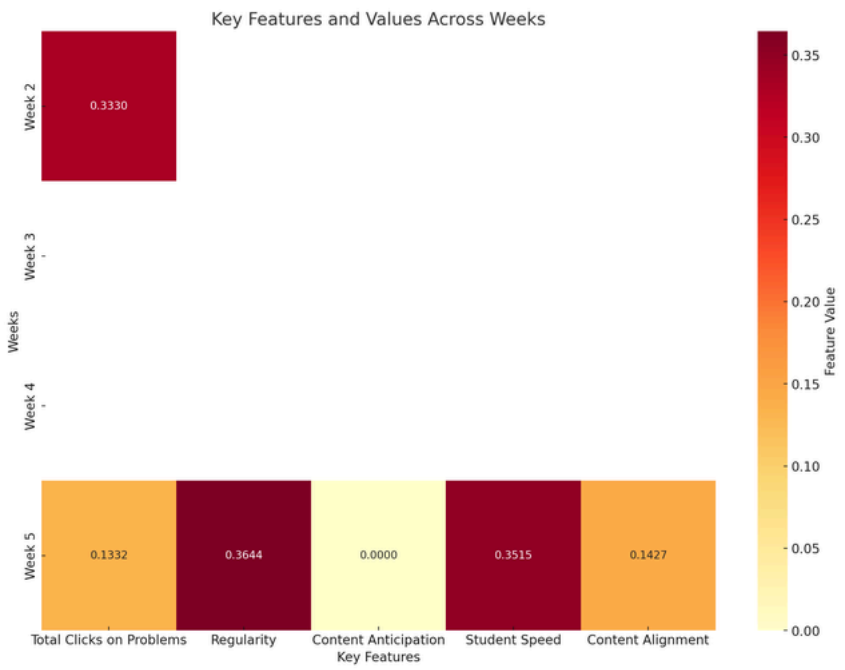
New Information:
Assuming you know that engaging with course material is essential, it's clear you might not be aware of how critical your interaction with problem-solving activities and regular study habits are. You also need to know that aligning with weekly content and previewing upcoming material can significantly enhance your understanding and retention.

I focused on these causes because they are crucial for your learning and have not been adequately addressed. Improving these areas will help you progress.

Where to Next?

1. **Weeks 6 and 7:** Focus on regular interaction with problem-solving activities. This will help reinforce your understanding of the new

topics on urban form and diagnostic tools.
2. **Weeks 6 and 7:** Establish a consistent study schedule. Regularly engage with the new material on accessibility, mobility, and GIS to build a strong foundation for the upcoming weeks.



---Explanation 2---

Feedback on Your Course Progress

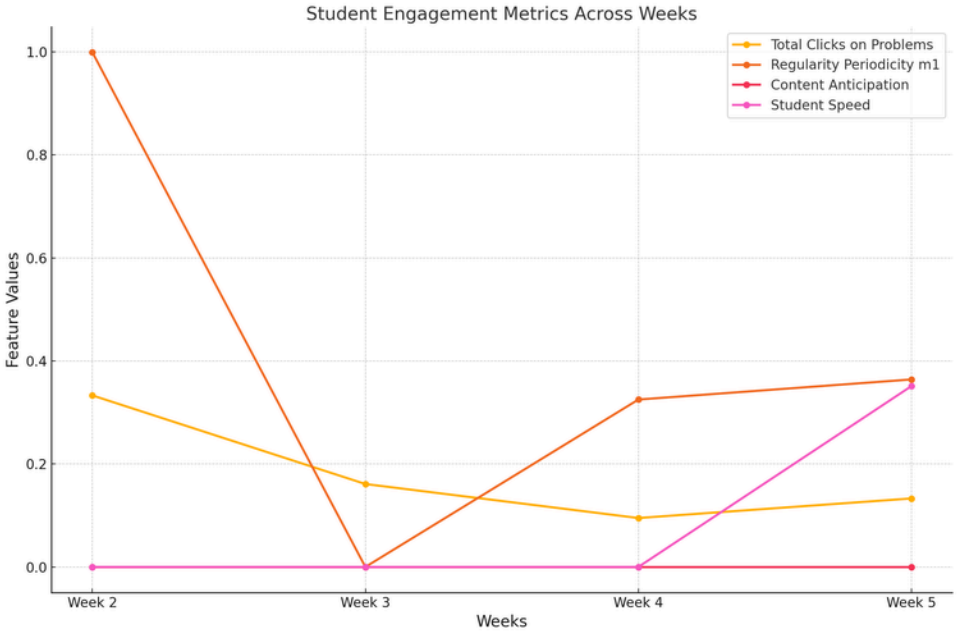
Where Am I Going?
You are currently working on the course "Villes africaines I: Introduction a la planification urbaine." The goal is to successfully understand and apply concepts related to urban planning in Africa and pass the course.

How Am I Doing?

- **Abnormal Causes:** Your engagement with problem-solving activities has been zero across Weeks 2, 3, 4, and 5. This is crucial because problem-solving helps you apply what you learn.
- **Recent Events:** Recently, you have not been interacting with video lectures or quizzes. These activities are essential for understanding and reinforcing the course material.
- **Controllable Factors:** You have control over your study patterns and engagement with course content. By actively participating in problem-solving activities, watching videos, and taking quizzes, you can improve your learning.

Where to Next?

1. **Week 6:** Focus on watching the video lectures on "Critical reading" and "The 10 basic principles." Engage with the quizzes to test your understanding.
2. **Week 7:** Participate in problem-solving activities related to "Tools of urban planning" and "Diagnostic." This will help you apply the concepts and prepare for the upcoming weeks.

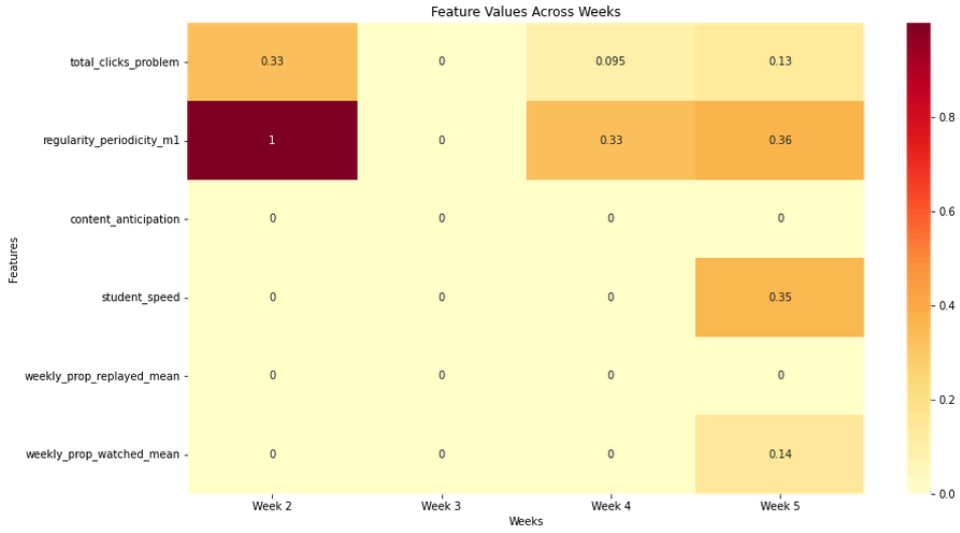


---Explanation 3---

Your performance so far indicates that you have not been engaging with key course activities, which is crucial for your understanding and success in "Villes africaines I: Introduction a la planification urbaine." The learning goal is to actively participate in problem-solving activities, watch video lectures, and maintain consistent study habits.

You have not clicked on any problems in Weeks 2, 3, 4, and 5, nor have you interacted with video content or maintained regular study patterns. This lack of engagement is significantly impacting your learning. Key causes for this are the absence of clicks on problem-solving activities and video lectures, and irregular study habits. These activities are essential for reinforcing and applying the concepts taught in the course.

To improve, focus on engaging with the problem-solving activities in Week 6, which covers critical reading and urban planning principles. Additionally, make sure to watch the video lectures and attempt the quizzes in Week 7, which delve into urban planning tools and diagnostics. This will help you catch up and build a stronger foundation for the remaining weeks.



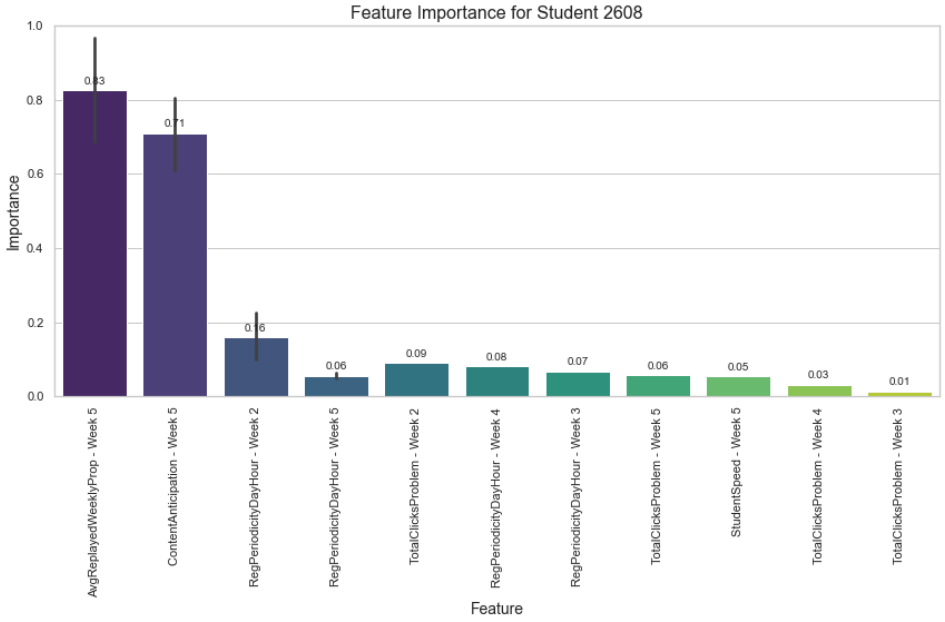
---Explanation 4---

This student is predicted to pass the course with likelihood 60.19%. The model's explanation is determined by finding the smallest number of changes necessary to change a prediction from student failure to student success (or vice versa). The outputs are the sets of features with the new values that would change the prediction. The model found the following features to be the most important for this student:

Top Contributing Features:
TotalClicksProblem: The number of clicks that a student has made on problems this week.
RegPeriodicityDayHour: The extent to which the hourly pattern of user's activities repeats over days.
ContentAnticipation: The number of videos covered by the student from those that are in subsequent weeks.
StudentSpeed: The average time passed between two consecutive attempts for the same quiz.
AvgReplayedWeeklyProp: The ratio of videos replayed over the number of videos available.

Minimal Counterfactual:
TotalClicksProblem in Week 5: 0.058
TotalClicksProblem in Week 4: 0.032
RegPeriodicityDayHour in Week 5: 0.048

The top feature-weeks found important are described in the plot. Improving on these behaviors could lead to stronger performance in the course.



Which explanation do you prefer the most?

Why do you prefer this explanation?

What is the main action you would you take in the next week based on your preferred explanation?

- I would improve my regularity of learning on the platform (have a daily or weekly schedule).
- I would watch video lectures immediately when they are released
- I would attempt more problems.
- I would spend more time on the platform.
- I would watch more videos.
- I would engage more heavily with videos (pausing, replaying, rewinding)
- I would practice more for the quiz so I could solve it in fewer attempts.
- I would try to attempt quizzes for the next weeks earlier.
- I would try to solve the quizzes faster.
- I would try to watch videos for the next weeks earlier.

For this action, which weeks of material would you focus on? (Select

minimum 1 week and maximum 3 weeks to focus on)

Review Week 1 (Intro, Urban Planning, African Cities)	Review Week 2 (Stakes and Challenges, Which model for which city)	Review Week 3 (Globalization and Cities, Climate Change, Transport)	Review Week 4 (Urban Facilities, Public Spaces)	Review Week 5 (Urban Sprawl, Professions, Informal settlements)	Engage in upcoming Week 6 (Critical Reading, 10 basic principles, Urban Agriculture)	Engage in upcoming Week 7 (Tools of urban planning, GIS)	(
☐	☐	☐	☐	☐	☐	☐	

How would you grade each explanation?

A score of 1 is the lowest for each criteria, a score of 5 is the highest for each criteria. You can select multiple explanations for each score.

- **Usefulness**: This explanation is useful to understand the prediction based on my learning behavior.
- **Trustworthiness**: This explanation lets me judge if I should trust the suggestions.
- **Actionability**: This explanation helps me make a decision on how to improve my learning behavior.
- **Completeness**: This explanation has sufficient detail to understand why the prediction was made based on my learning behavior.
- **Conciseness**: Every detail of this explanation is necessary.

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Usefulness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trustworthiness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Actionability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completeness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Conciseness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Student 3a

Elements of Geometry
(Course 3/3, Explanations 1/2)

---Explanation 1---

You are doing well in the course, but let's focus on a few key areas to ensure you finish strong.

Your learning goal is to pass the course with a solid understanding of geomatics principles.

How Am I Doing?

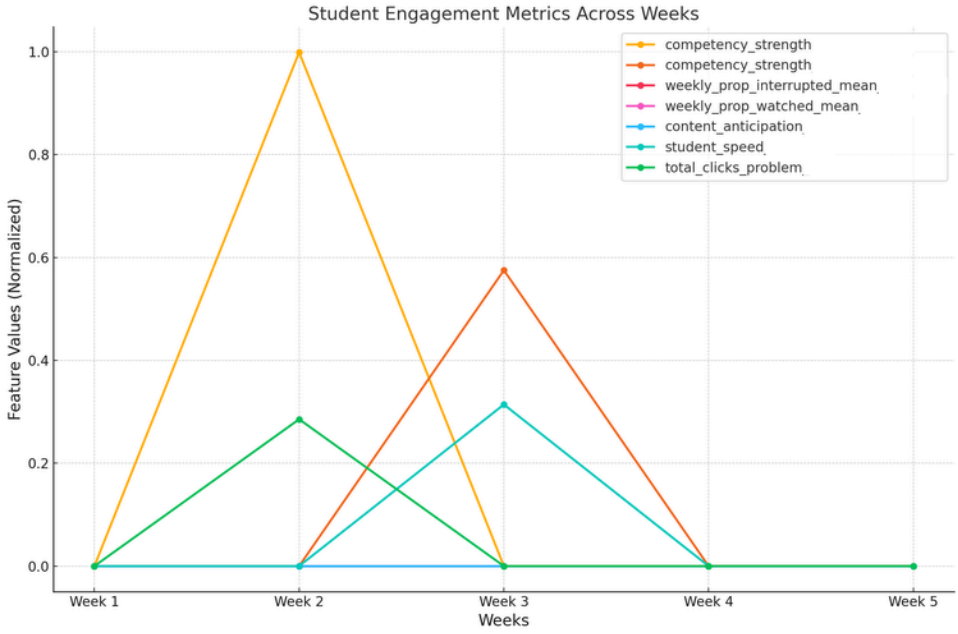
Abnormal Causes:
- Your competency strength was very high in Week 2 but not as consistent in other weeks. This is important because it shows you have the potential but need to maintain it.
- You had no interruptions in Week 5, which is unusual and suggests you might not be engaging as much as before.

Recent Events:
- In Week 3, you had a high proportion of interrupted sessions, which shows active engagement despite interruptions.
- However, in Week 5, you did not replay videos, indicating you understood the content well.

Controllable Factors:
- Engage consistently: Ensure you maintain regular study sessions and minimize interruptions.
- Preview upcoming materials: Start looking at the content for future weeks to build a stronger foundation.

Where to Next?

1. **Week 6 (Geometric Leveling):** Focus on understanding the definitions of altitudes and measurement principles. This will help you build on your Week 5 skills in modeling and interpolation.
2. **Week 7 (Surveying):** Start previewing the topics on surveying and orientation now. This will help you connect the concepts from geometric leveling to practical surveying techniques.



---Explanation 2---

Performance Feedback

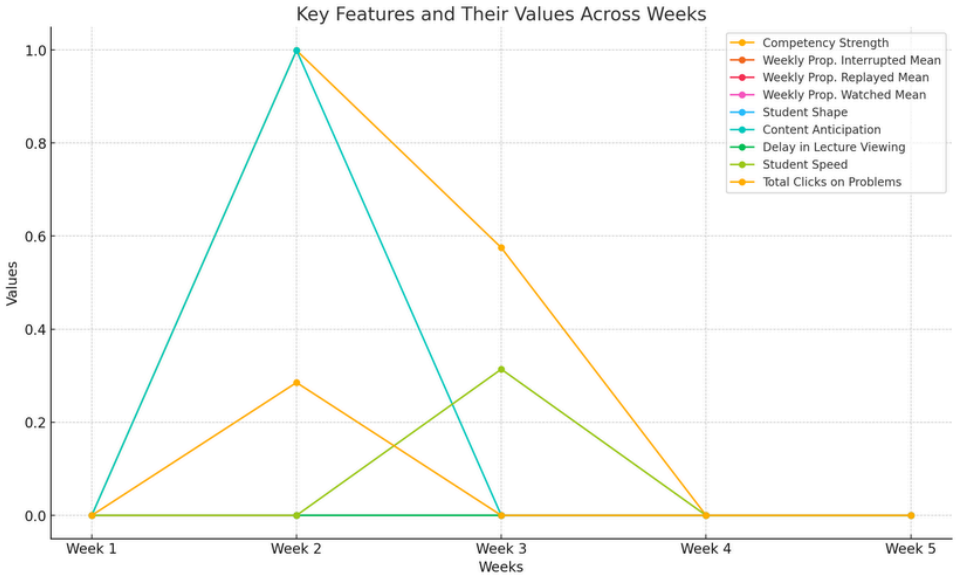
You've been doing well in the "Elements de Geomatique" course, but there are areas where you can improve to ensure a strong finish. The goal is to consistently engage with the course material and improve problem-solving skills.

How Am I Doing?

- **Target Event (P):** In Week 2, you showed high competency strength, performing exceptionally well on quizzes. This is important as it shows your potential when fully engaged.
- **Contrast Event (Q):** In Week 5, your competency strength was low, and you spent a moderate amount of time on problems but struggled. This contrast highlights areas that need attention.
- **Key Causes**: High competency strength in Week 2 was due to focused study and understanding of geodetic principles. In Week 5, lack of anticipation for future content and lower engagement in problem-solving led to weaker performance. Understanding these causes helps identify where to focus your efforts.

Where to Next?

1. **Weeks 6-7**: Increase engagement with upcoming content, especially on geometric leveling and surveying. Preview materials and start early to build a strong foundation.
2. **Weeks 4-5**: Revisit cartography and modeling topics. Practice additional problems to strengthen your problem-solving skills and ensure you understand the material thoroughly.



---Explanation 3---

Course Title: Elements de Geomatique

Where Am I Going?

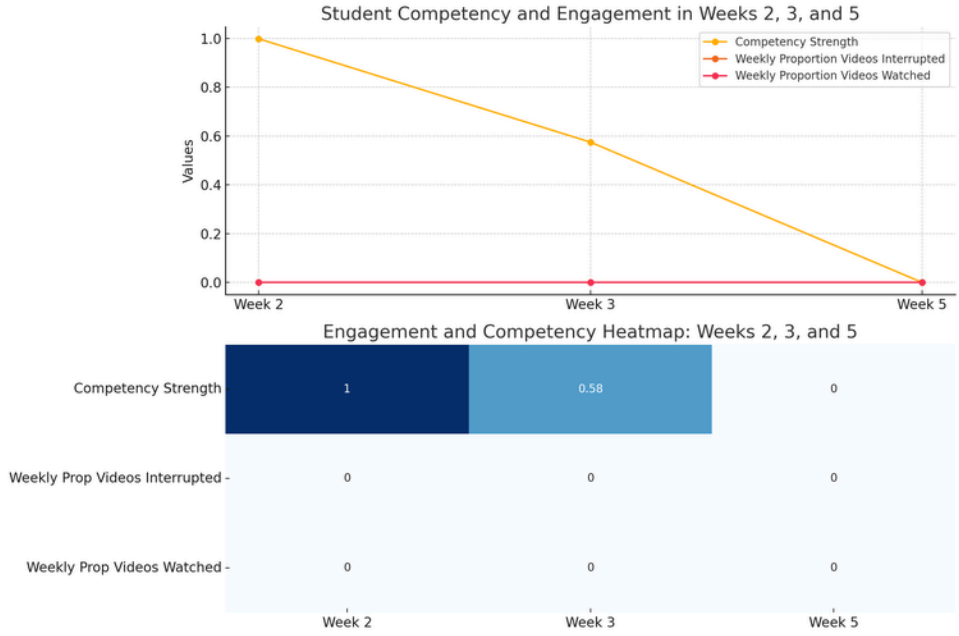
You are progressing through the course "Elements de Geomatique," which covers topics from geodesy to satellite positioning. Your goal is to successfully pass the course by mastering the weekly skills and quizzes.

How Am I Doing?

In Week 2, you showed strong competency, especially in understanding geodetic principles and units. However, your performance was inconsistent in Weeks 3 and 5, particularly in geodetic references and modeling. You faced many interruptions in Week 3, which suggests active engagement but also potential distractions. You did not anticipate future content, which might have negatively impacted your preparedness.

Where to Next?

1. **Week 6 (Geometric Leveling):** Focus on maintaining regular study sessions without interruptions. Review Week 5's modeling materials to strengthen your understanding, as geometric leveling builds on these concepts.
2. **Week 7 (Surveying):** Engage with the upcoming content on surveying by previewing the topics and quizzes. This will help you connect the detailed calculations and principles from Weeks 2 and 3 to the new material, enhancing your overall comprehension and performance.



---Explanation 4---

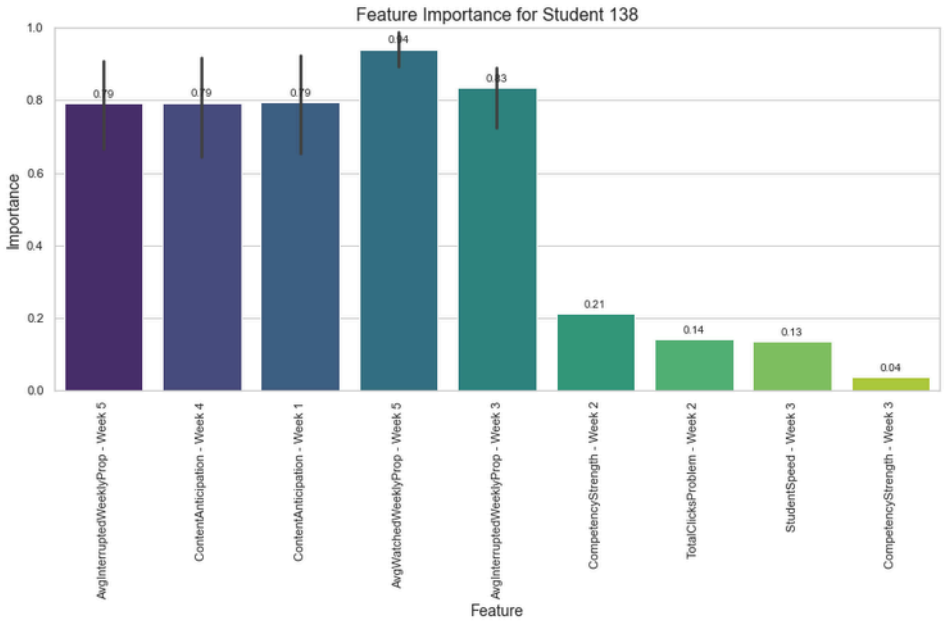
This student is predicted to pass the course with likelihood 80.80%. The model's explanation is determined by finding the smallest number of changes necessary to change a prediction from student failure to student success (or vice versa). The outputs are the sets of features with the new values that would change the prediction. The model found the following features to be the most important for this student:

Top Contributing Features:
AvgInterruptedWeeklyProp: The ratio of videos interrupted over the number of videos available.
ContentAnticipation: The number of videos covered by the student from those that are in subsequent weeks.
CompetencyStrength: The extent to which a student passes a quiz getting the maximum grade with few attempts.
AvgWatchedWeeklyProp: The ratio of videos watched over the number of videos available.
TotalClicksProblem: The number of clicks that a student has made on problems this week.
StudentSpeed: The average time passed between two consecutive attempts for the same quiz.

Minimal Counterfactual:
CompetencyStrength in Week 2: 0.213
AvgInterruptedWeeklyProp in Week 5: 0.235
CompetencyStrength in Week 3: 0.037

The top feature-weeks found important are described in the plot.

Improving on these behaviors could lead to stronger performance in the course.



Which explanation do you prefer the most?

Why do you prefer this explanation?

What is the main action you would you take in the next week based on your preferred explanation?

- I would improve my regularity of learning on the platform (have a daily or weekly schedule).
- I would watch video lectures immediately when they are released
- I would attempt more problems.
- I would spend more time on the platform.
- I would watch more videos.
- I would engage more heavily with videos (pausing, replaying, rewinding)
- I would practice more for the quiz so I could solve it in fewer attempts.
- I would try to attempt quizzes for the next weeks earlier.
- I would try to solve the quizzes faster.
- I would try to watch videos for the next weeks earlier.

For this action, which weeks of material would you focus on? (Select minimum 1 week and maximum 3 weeks to focus on)

Review Week 1 (Introduction to Geomatics)	Review Week 2 (Geodesy)	Review Week 3 (Geodetic References)	Review Week 4 (Cartography)	Review Week 5 (Modeling and Interpolation)	Engage in upcoming Week 6 (Geometric Leveling)	Engag upcor Week (Survey
☐	☐	☐	☐	☐	☐	

How would you grade each explanation?

A score of 1 is the lowest for each criteria, a score of 5 is the highest for each criteria. You can select multiple explanations for each score.

- **Usefulness**: This explanation is useful to understand the prediction based on my learning behavior.
- **Trustworthiness**: This explanation lets me judge if I should trust the suggestions.
- **Actionability**: This explanation helps me make a decision on how to improve my learning behavior.
- **Completeness**: This explanation has sufficient detail to understand why the prediction was made based on my learning behavior.
- **Conciseness**: Every detail of this explanation is necessary.

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Usefulness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trustworthiness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Actionability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completeness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Conciseness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Student 3b

Elements of Geometry
(Course 3/3, Explanations 2/2)

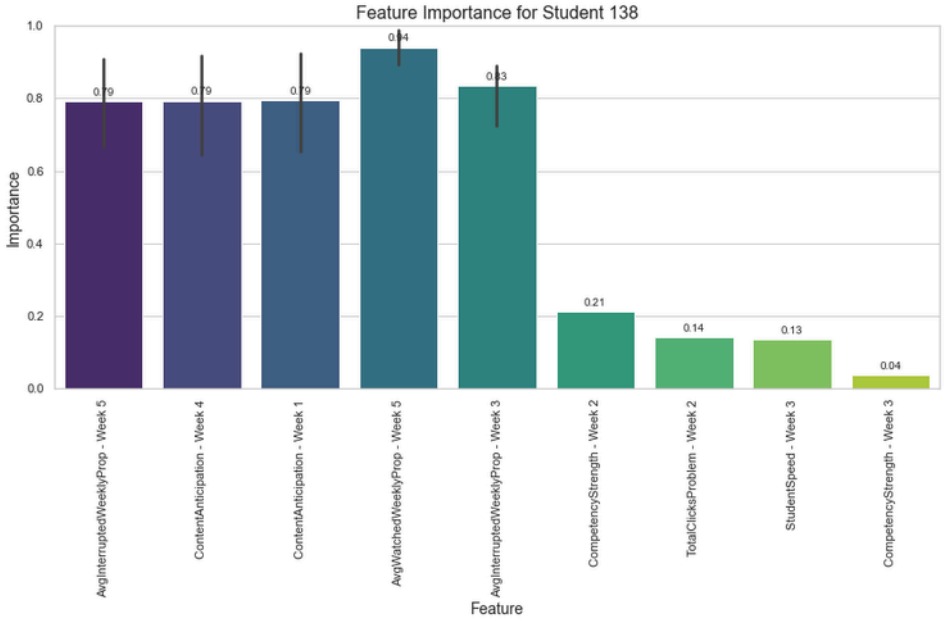
---Explanation 1---

This student is predicted to pass the course with likelihood 80.80%. The model's explanation is determined by approximating the 20 features that contributed the most to the this student's prediction, with positive scores contributing towards a passing prediction and negative stores contributing towards a failing prediction. The magnitude of the score indicates the strength of the feature's contribution. The model found the following features to be the most predictive for this student:

Top Contributing Features to Student Failure:
CompetencyStrength: The extent to which a student passes a quiz getting the maximum grade with few attempts.
AvgReplayedWeeklyProp: The ratio of videos replayed over the number of videos available.
StudentShape: The extent to which the student receives the maximum quiz grade on the first attempt.
DelayLecture: The average delay in viewing video lectures after they are released to students.

Top Contributing Features to Student Success:
CompetencyStrength: The extent to which a student passes a quiz getting the maximum grade with few attempts.
AvgInterruptedWeeklyProp: The ratio of videos interrupted over the number of videos available.
AvgWatchedWeeklyProp: The ratio of videos watched over the number of videos available.
ContentAnticipation: The number of videos covered by the student from those that are in subsequent weeks.

The top 20 feature-weeks found important are described in the plot. Improving on these behaviors could lead to stronger performance in the course.



---Explanation 2---

You've been doing well overall, but let's focus on some areas to ensure you succeed in "Elements de Geomatique."

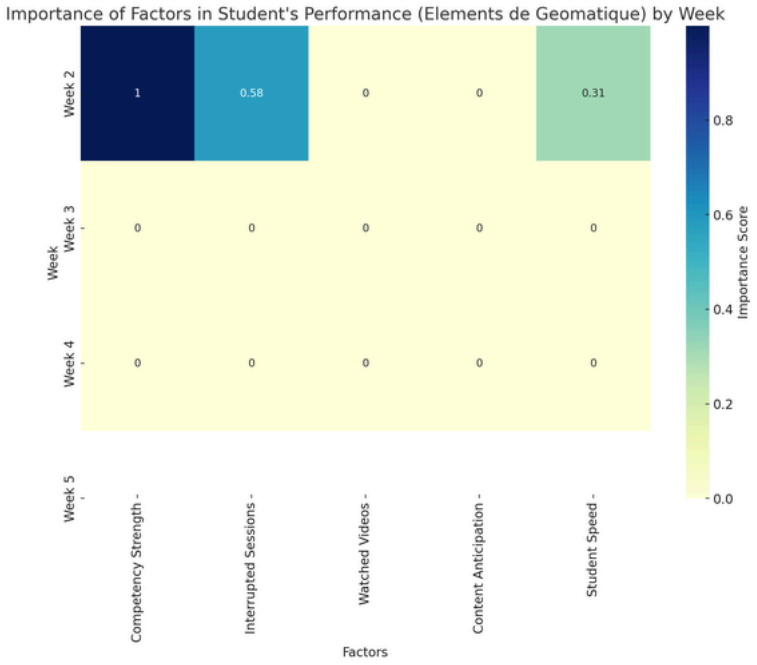
Where Am I Going?
Your goal is to pass the course by mastering the weekly skills and quizzes, from geodesy and cartography to satellite positioning principles.

How Am I Doing?
Necessary Causes:
- Competency Strength in Week 2: You performed very well in Week 2, but this high performance wasn't consistent in other weeks.
- Interrupted Sessions in Week 3: You had many interruptions in Week 3, which, surprisingly, didn't hinder your performance significantly.

Robust Explanation:
- Quiz Performance: While you didn't always get the maximum grade on the first attempt in Weeks 4 and 5, your persistence and multiple attempts positively impacted your learning.
- Timely Lecture Viewing: You viewed lectures on time in Week 5, which helped you stay on track.

Where to Next?
1. Weeks 6 and 7: Focus on maintaining consistent study sessions and reducing interruptions. This will help you build on the skills from Week 5, like Modeling and Interpolation, and prepare for Geometric Leveling and Surveying.
2. Weeks 8 and 9: Start previewing upcoming materials on Polar

Surveying and Distance Measurement Techniques. This anticipation will give you a head start and solidify your understanding of current concepts.



---Explanation 3---

Student Feedback Report

Where Am I Going?
You've shown potential in the "Elements de Geomatique" course. Your goal is to pass the course by maintaining consistent engagement and improving problem-solving skills.

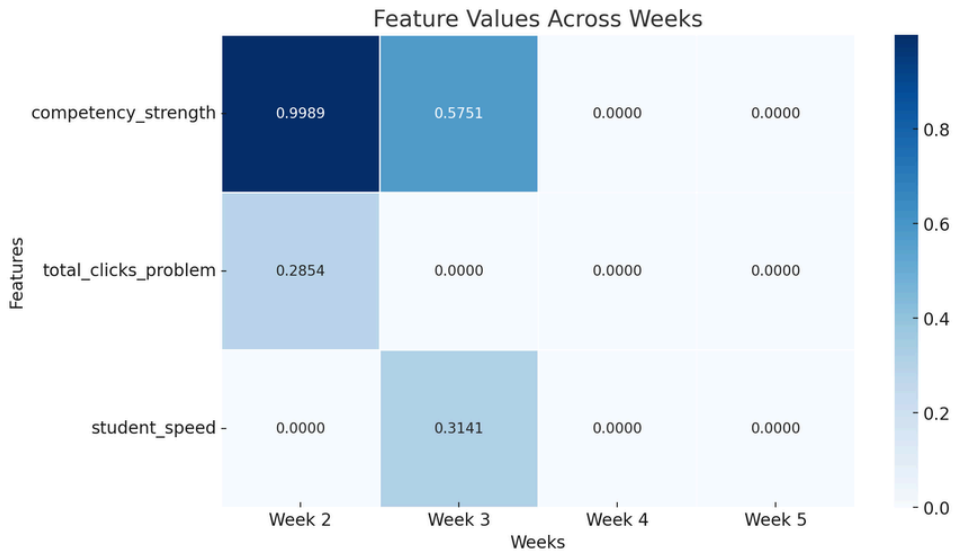
How Am I Doing?
External Factors:
- **Interrupted Sessions:** In Week 3, you had many interrupted sessions, which indicates active engagement but also distractions. Maintaining focus is crucial for better performance.
- **Lecture Viewing:** In Week 5, you viewed lectures promptly, which is beneficial.

Internal Relationships:
- **Competency Strength**: Your performance was strong in Week 2 but inconsistent in later weeks. This inconsistency can affect your overall success.
- **Content Anticipation:** You didn't engage with future content in Weeks 1, 2, and 3, which is essential for building a strong foundation.

Focus on Improvement:
- **Problem Solving:** In Week 5, you spent a moderate amount of time

on problems but struggled. More practice will help improve your skills.
- **Replaying Videos:** Not replaying videos in Week 5 suggests good initial understanding, but revisiting difficult topics could reinforce your learning.

Where to Next?
1. **Weeks 6-7**: Focus on consistent study sessions without interruptions. Use resources to practice problem-solving, especially on geometric leveling and surveying.
2. **Weeks 8-10**: Start previewing future content on polar surveying and satellite positioning. This will help you anticipate and understand upcoming material better.



---Explanation 4---

Feedback on Your Course Performance

Where Am I Going?
Your goal is to pass the "Elements de Geomatique" course by mastering the weekly skills and topics, and performing well on quizzes.

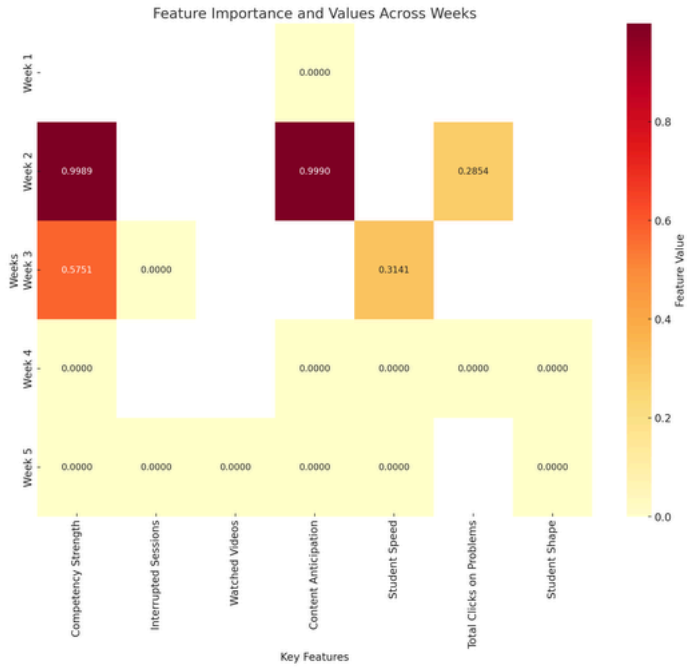
How Am I Doing?
***Relevant Causes*:** Your high competency strength in Week 2 (excellent quiz performance) and moderate competency in Week 3 are notable. However, there was a lack of competency in Weeks 4 and 5.
***New Information*:** Assuming you know your quiz scores, you may not realize that the lack of anticipation for future content in Weeks 1, 2, and 3 (not previewing upcoming materials) negatively impacted your progress. Additionally, no interrupted sessions in Week 5 suggest less engagement.

Focus: I focused on competency strength and content anticipation as they provide new insights into your study habits and engagement. These are important for consistent performance and future preparedness.

Where to Next?

1. Week 6: Focus on maintaining consistent study sessions and actively engage with the new topics on Geometric Leveling. This will help improve your competency and reduce interruptions.

2. Weeks 7 and 8: Preview the materials on Surveying and Polar Surveying in advance. This anticipation will help you build a stronger foundation and perform better in the upcoming quizzes.



Which explanation do you prefer the most?

Why do you prefer this explanation?

What is the main action you would you take in the next week based on your preferred explanation?

I would improve my regularity of learning on the platform (have a daily or weekly schedule).

I would watch video lectures immediately when they are released

I would attempt more problems.

I would spend more time on the platform.

I would watch more videos.

I would engage more heavily with videos (pausing, replaying, rewinding)

I would practice more for the quiz so I could solve it in fewer attempts.

I would try to attempt quizzes for the next weeks earlier.

I would try to solve the quizzes faster.

I would try to watch videos for the next weeks earlier.

For this action, which weeks of material would you focus on? (Select minimum 1 week and maximum 3 weeks to focus on)

Review Week 1 (Introduction to Geomatics)	Review Week 2 (Geodesy)	Review Week 3 (Geodetic References)	Review Week 4 (Cartography)	Review Week 5 (Modeling and Interpolation)	Engage in upcoming Week 6 (Geometric Leveling)	Engag upcor Week (Survey
☐	☐	☐	☐	☐	☐	

How would you grade each explanation?

A score of 1 is the lowest for each criteria, a score of 5 is the highest for each criteria. You can select multiple explanations for each score.

- **Usefulness**: This explanation is useful to understand the prediction based on my learning behavior.
- **Trustworthiness**: This explanation lets me judge if I should trust the suggestions.
- **Actionability**: This explanation helps me make a decision on how to improve my learning behavior.
- **Completeness**: This explanation has sufficient detail to understand why the prediction was made based on my learning behavior.
- **Conciseness**: Every detail of this explanation is necessary.

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Usefulness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trustworthiness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Actionability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Completeness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

	EXP 1					EXP 2					EXP 3					EXP 4				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Conciseness	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

End remarks

Rank the criterias that matter most to you.

Usefulness

Trustworthiness

Actionability

Completeness

Conciseness

Could you elaborate on why you ranked the criteria this way? What do you expect from the explanation of a model's prediction?

How important are the following elements of the explanation?

	1	2	3	3	4	5
Textual Explanation						☐
Plot						☐

Finally, we would like to ask for your general feedback. Do you have any comments or suggestions that you would like to give us?