Designing Ethically-Integrated Assignments: It's Harder Than it Looks

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The dark side of ChatGPT: things it can do, even though it shouldn't

By Monica J. White
April 16, 2023

INNOVATIONS

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MONEYBOX

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By Pranshu Verma
July 16, 2022 at 6:00 a.m. EDT

Computing can have ethical consequences.

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COMPUTING

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Computing can have ethical consequences.

So, we should teach ethics in computing.

This is hard to do!

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Computing instructors aren’t experts in ethics.

Technical content is not related to ethics.

There’s already too much to cover.

(Smith et al., SIGCSE 2023)

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We focus on ethical decisions that are intertwined with technical ones

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This is [slightly less] hard to do!

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Technical Content

Ethical Context

Ethically-Integrated Assignment

Goal: Design ethically-integrated assignments

Methodology: Research through Design

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Designed ethically-integrated assignments

Evaluated assignments through think-alouds

This is hard to do!

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Identifying an ethical context.

Maintaining a technical focus.

Eliciting students' integrated thinking.

Making the assignment practical for the classroom.

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None of these worked for our class.

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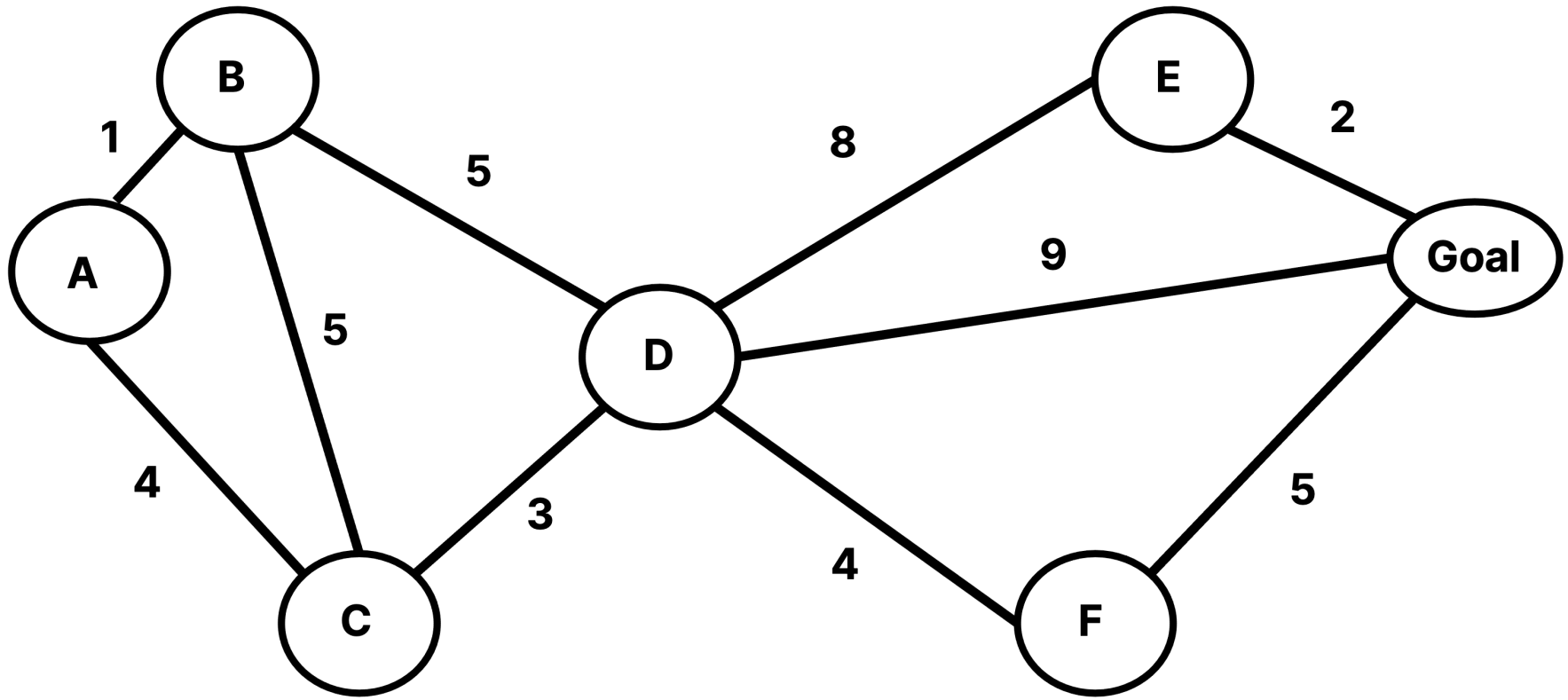
Suggestion: choose an ethical context that highlights impacts from technical choices.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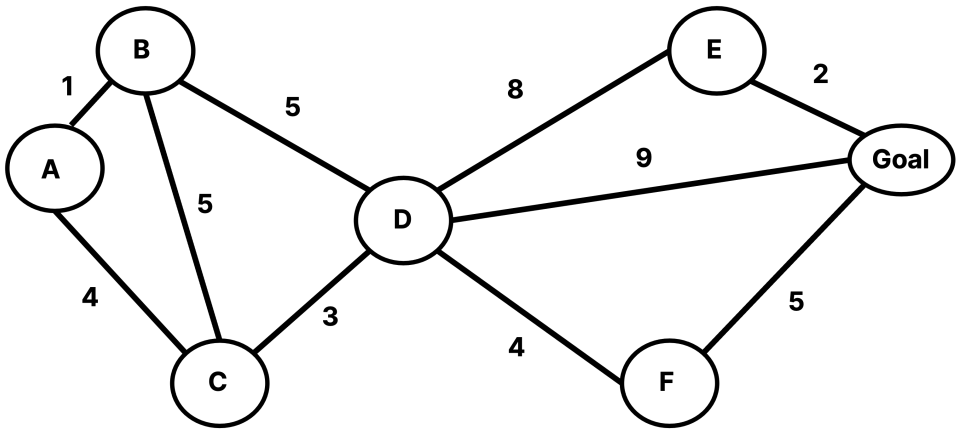
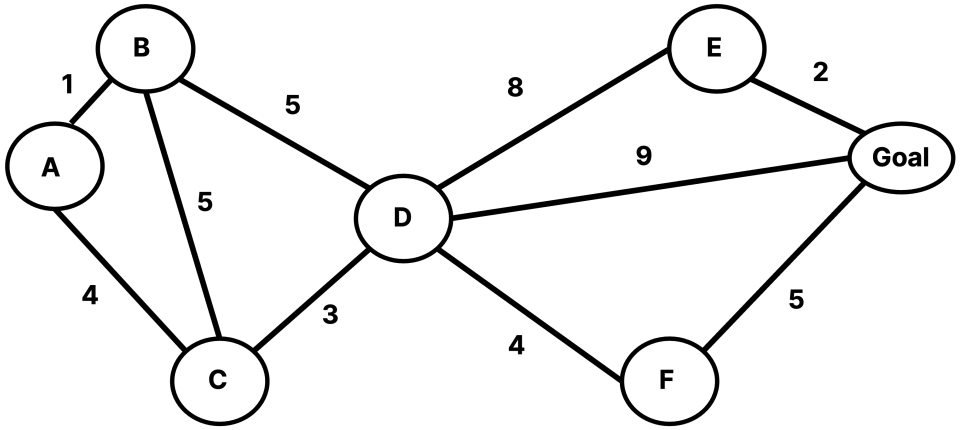
Judgements in technical steps

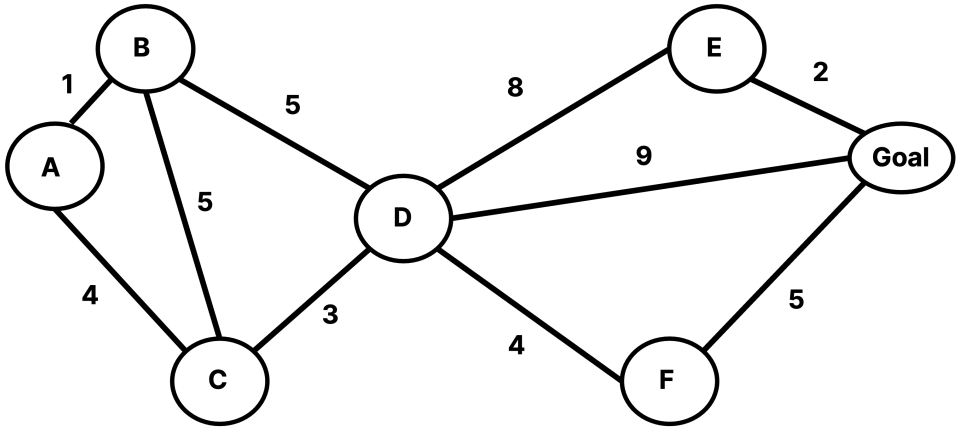


Implicit assumptions



Judgements in technical steps:
- Choice of optimization function
- Choice of algorithm

Implicit assumptions:
- A* algorithms will always find the lowest-cost path



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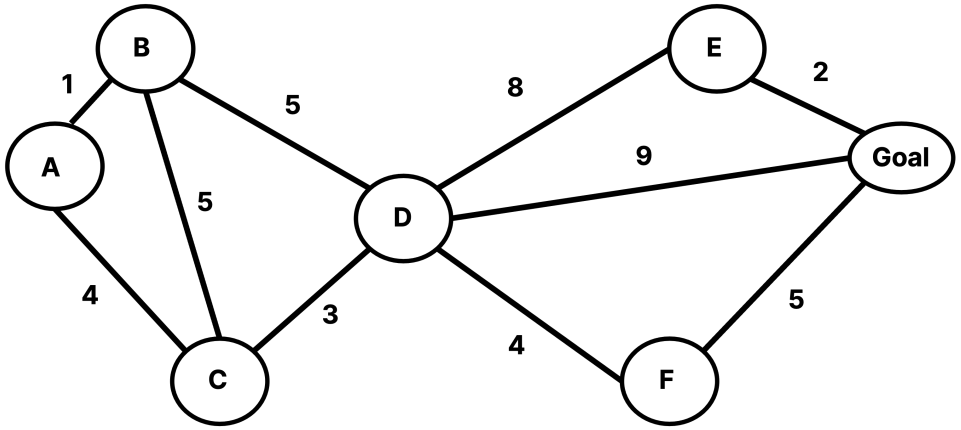
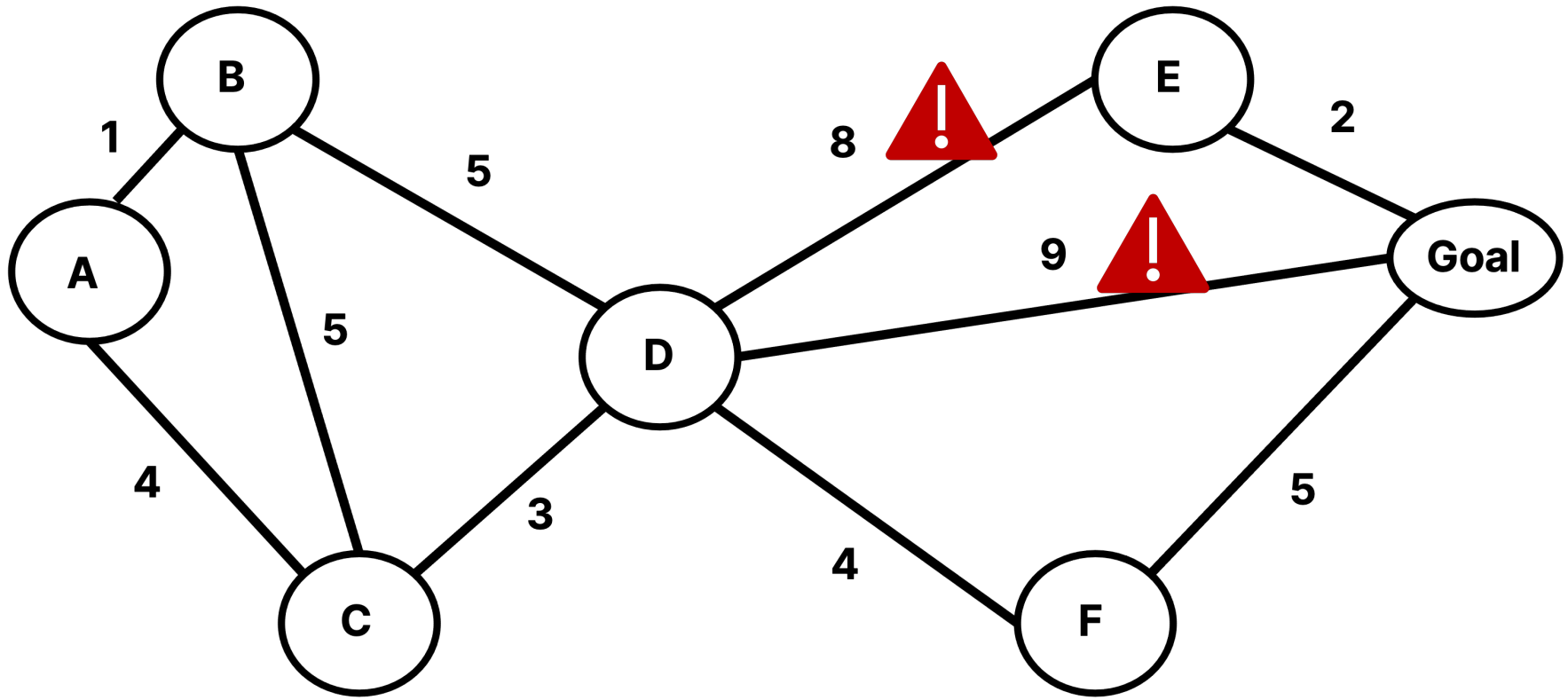


Implicit assumptions:

A* algorithms will always find the lowest-cost path

What is an ethical context where the lowest-cost path is not necessarily the best?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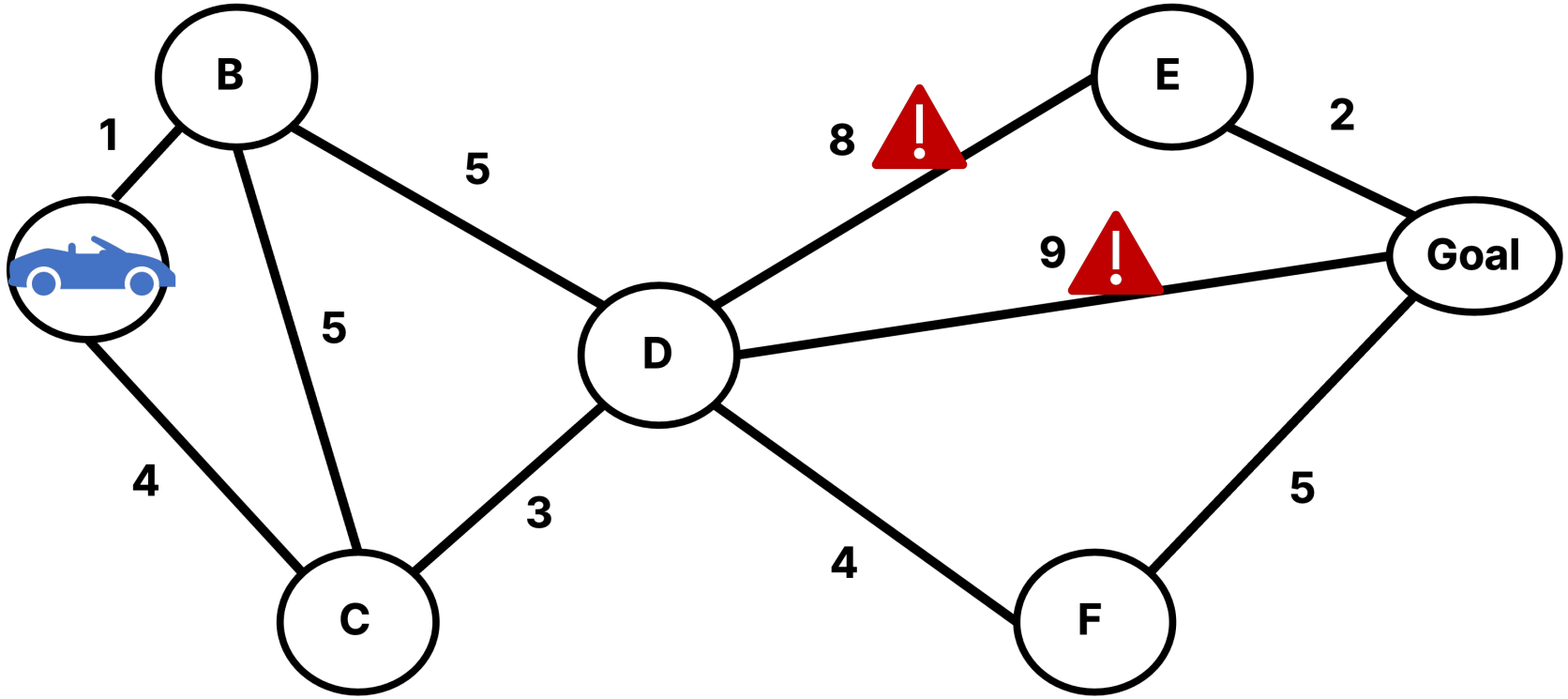
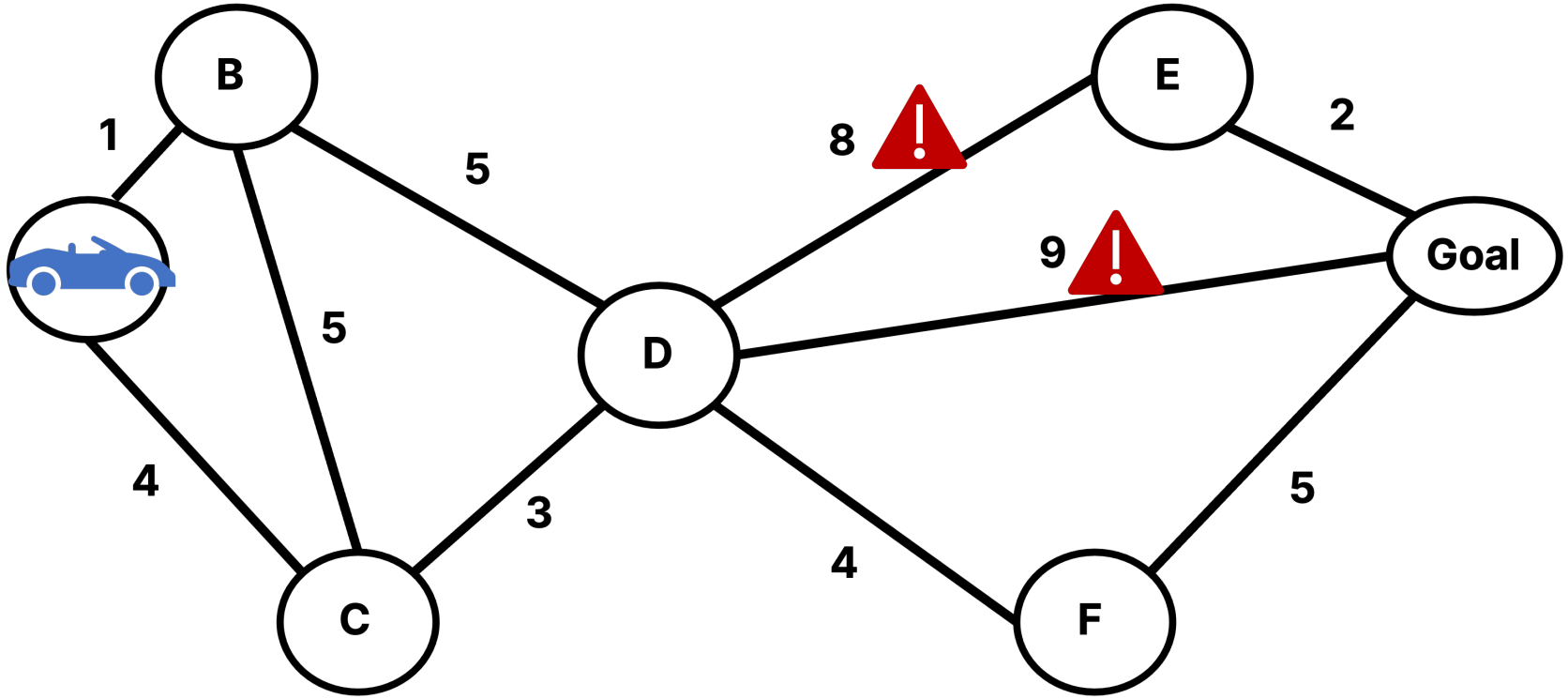


What ethical considerations exist when programming a self-driving car to find the best path to the goal?

Suggestion: make sure questions require both technical and ethical reasoning.

Can this question be answered without using technical content knowledge?

Does this question demonstrate the importance of human judgment in an ethics-relevant context?



What would you do to ensure your program does not lead passengers down an unsafe path?

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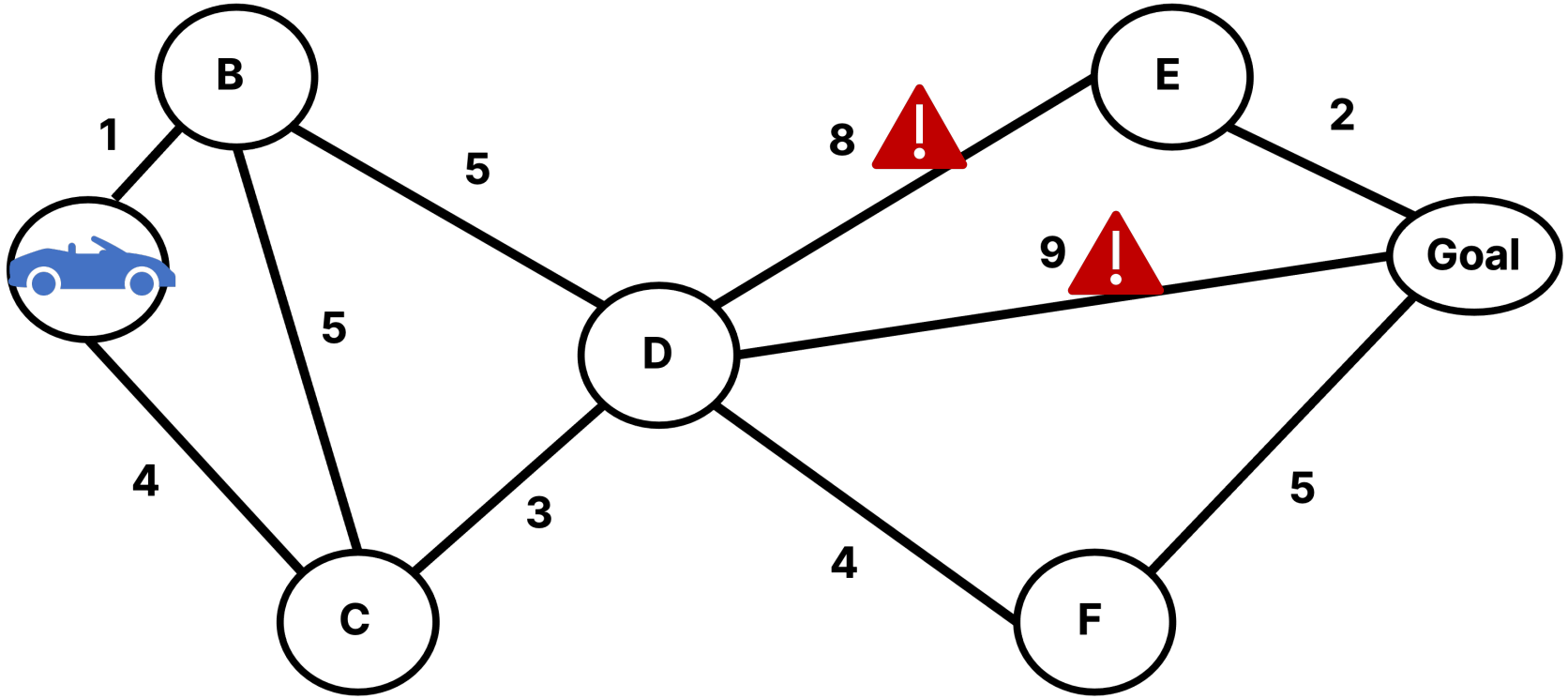
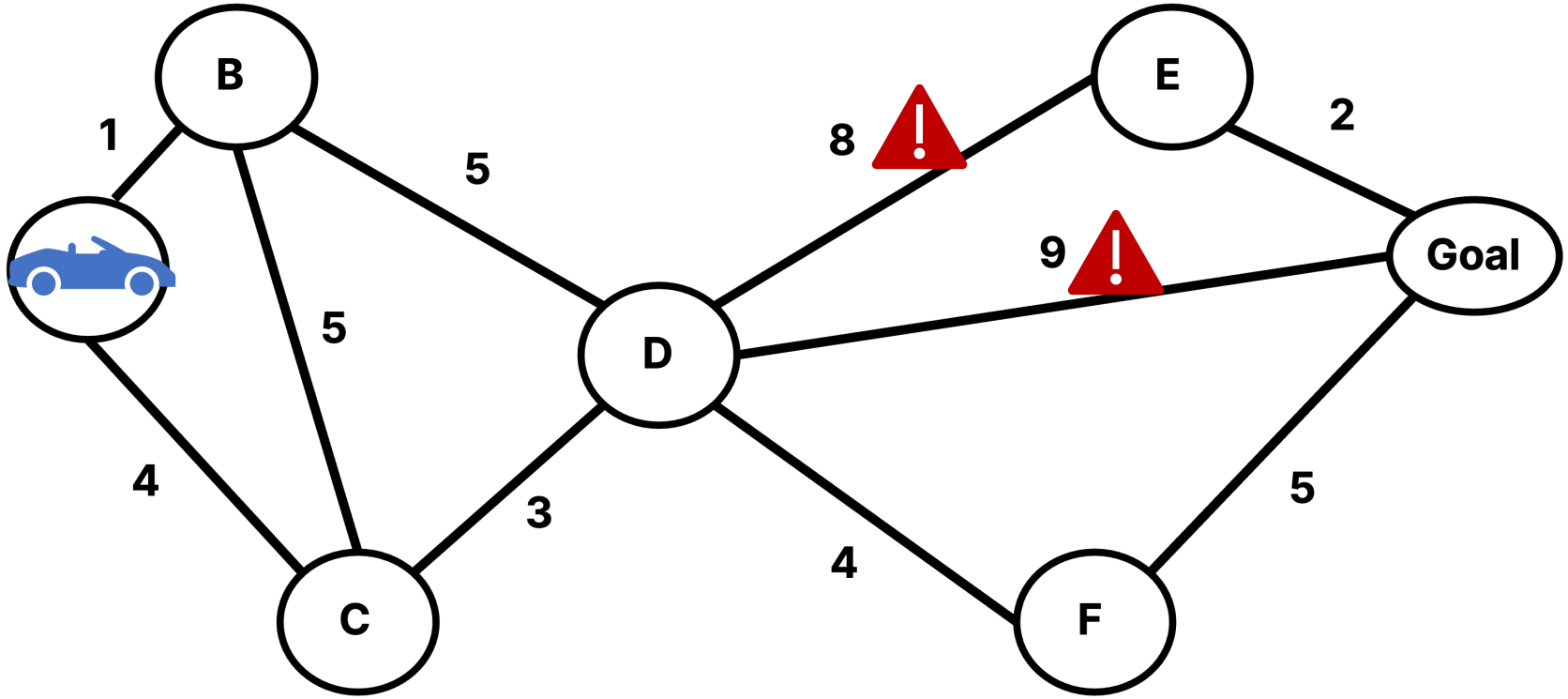


What would you do to ensure your program does not lead passengers down an unsafe path?

“Whenever I see a keyword [that] has a definition in the formal study of graph theory, I automatically think, ‘Okay, so I’m going into STEM mode,’ I’m not thinking about it as an ethics problem anymore.”

Suggestion: anticipate this, and write explicit questions.



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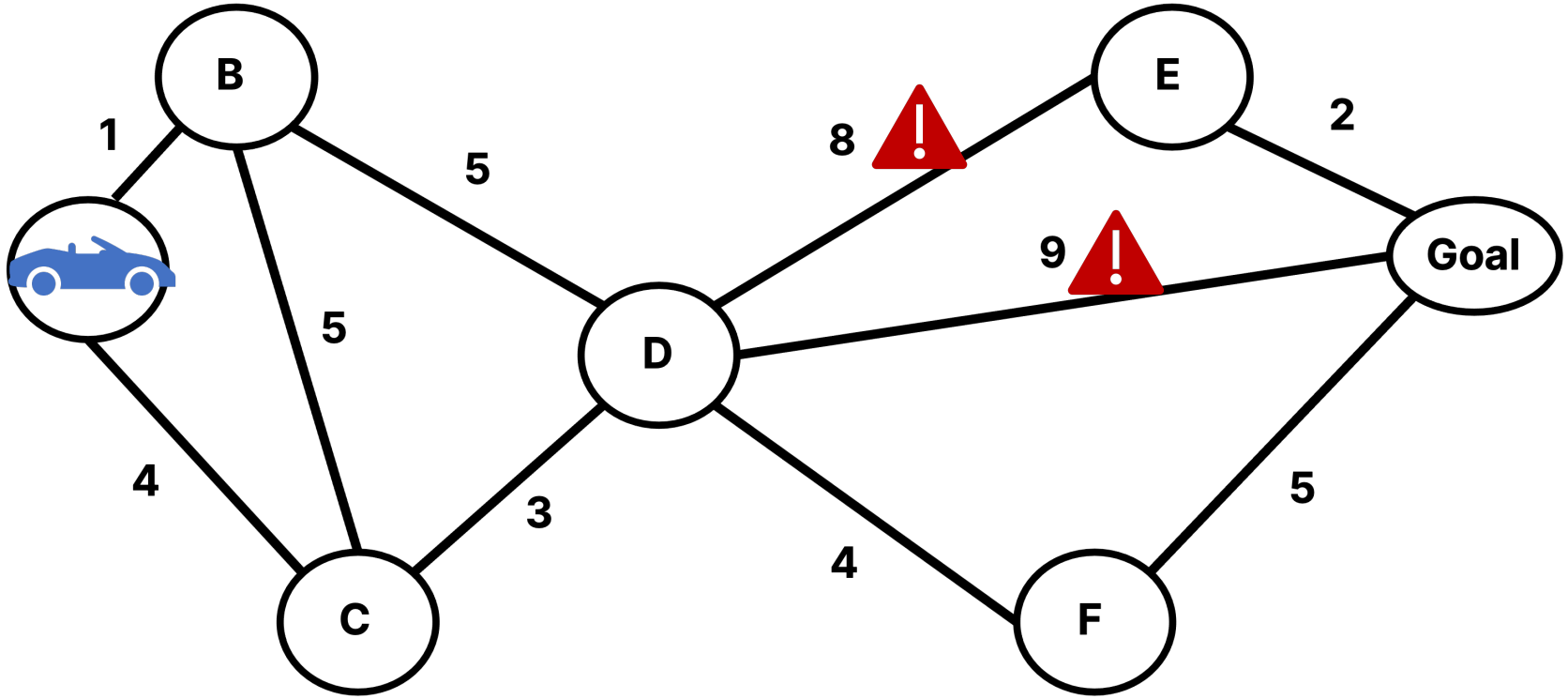

What specific algorithmic modifications can you make to ensure your program does not lead passengers down an unsafe path?

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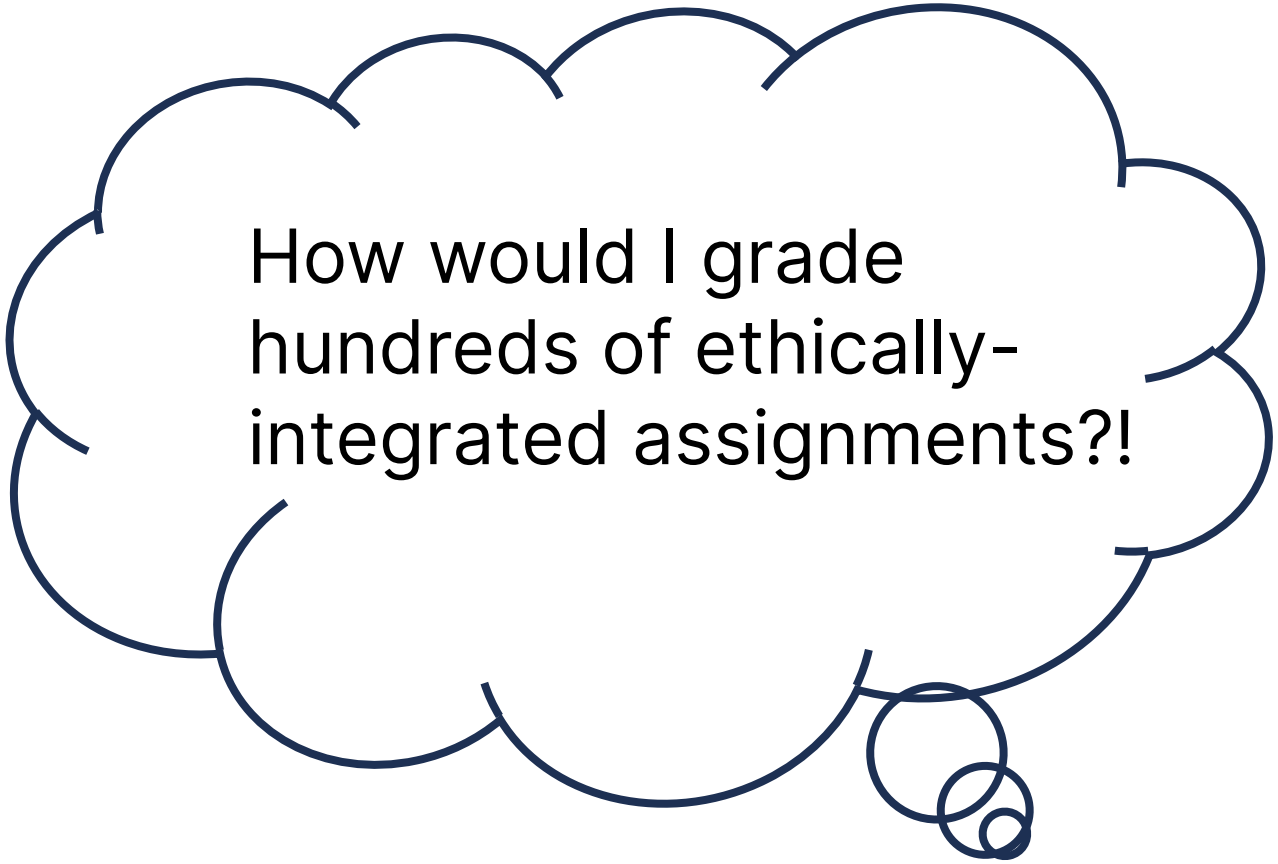
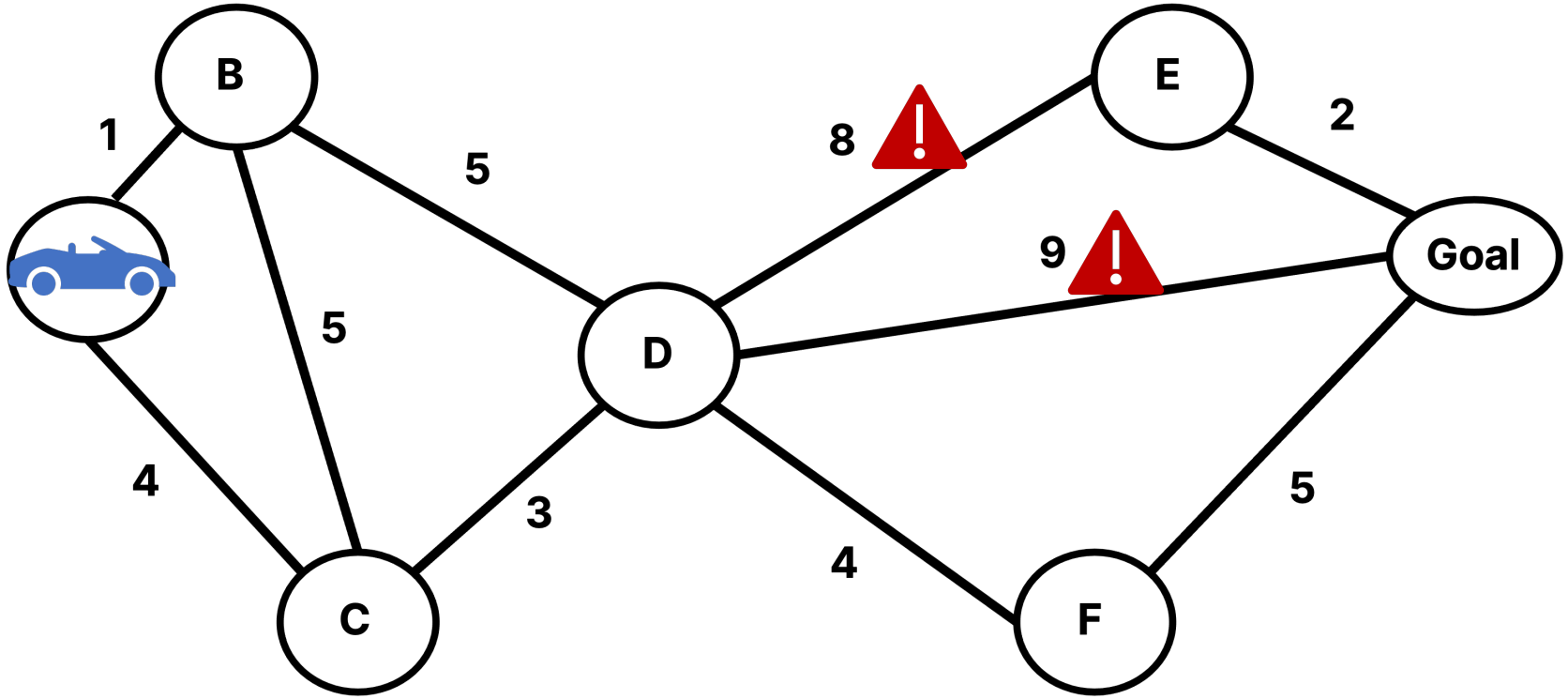


Suggestion: use auto-gradable questions.



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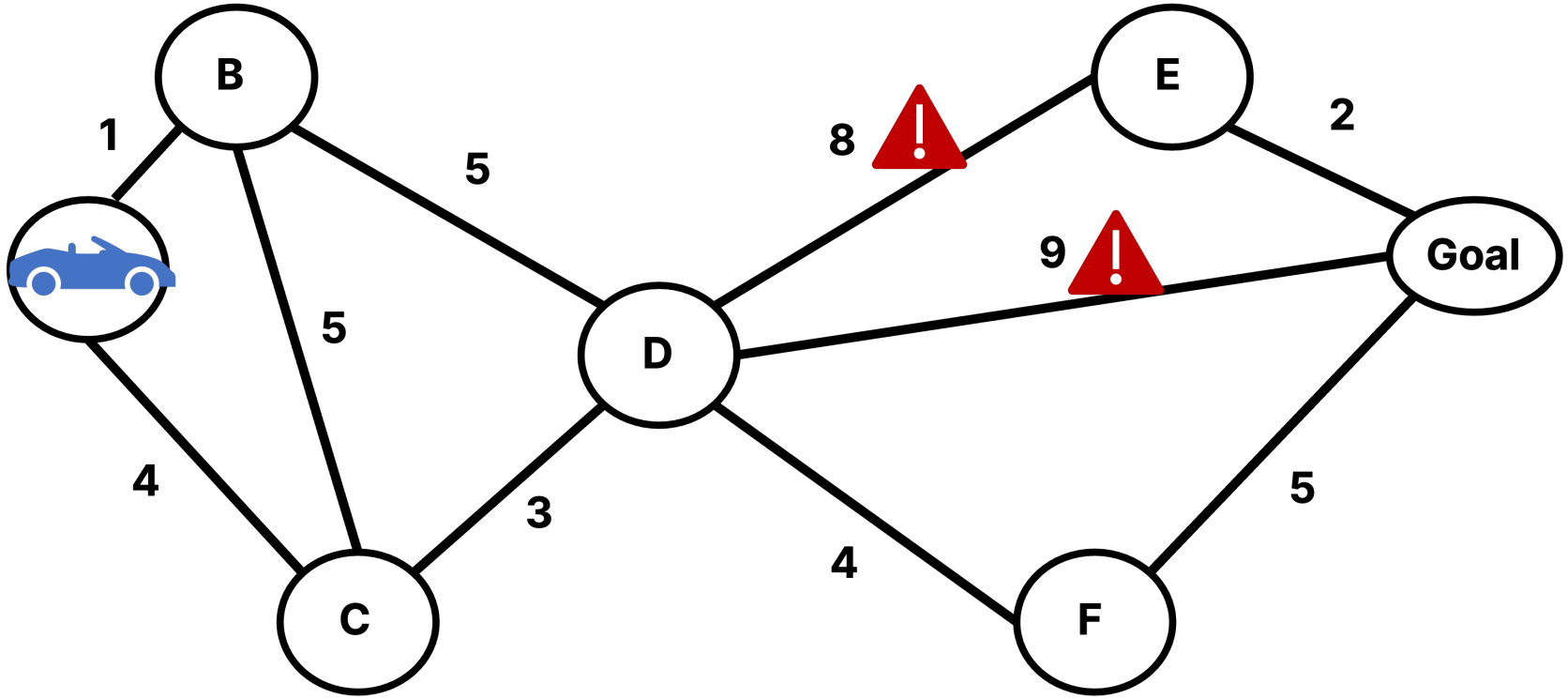

Select all algorithmic modifications that would ensure your program does not lead passengers down an unsafe path.

Select all algorithmic modifications that would ensure your program does not lead passengers down an unsafe path.

For each selection, how would this ensure your program does not lead passengers down an unsafe path?

Making the assignment practical for the classroom.

Suggestion: prepare for errors that could result harmful reasoning about the broader ethical issues.

This is [slightly less] hard to do!

1. Identifying an ethical context →
   Choose one that highlights impacts from technical choices.

2. Maintaining a technical focus →
   Make sure questions require both technical and ethical reasoning.

3. Eliciting students' integrated thinking →
   Write explicit questions.

4. Making the assignment practical for the classroom →
   Use auto-gradable questions.

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noelle.brown@utah.edu | noelleb.com

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