Table 1: Revision History

Date	Developer(s)	Change
Sept 22	Kelvin Lin	Completed fields for names and team information
Sept 23	Kelvin Lin	Created first draft of problem statement
Sept 23	Eric Chaput	Edited and expanded first draft
Sept 23	Kelvin Lin and Eric Chaput	Formatted document
Sept 25	Kelvin Lin	Minor modifications to second paragraph
Sept 30	Kelvin Lin	Made stakeholders more explicit (Line 44)

SE 3XA3: Problem Statement
Genetic Cars

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Genetic algorithms (GAs) search for near-optimal solutions to a wide variety of problems with incomplete or imperfect information by emulating the process of natural selection. Applications of genetic algorithms include automated design, bioinformatics, economics, game theory, and training neural networks. Stakeholders like students and professionals from many different industries, with technical and non-technical backgrounds can benefit from using GAs. However, despite the numerous applications of GAs, there is a persistent lack of online training resources for students and professionals to learn about them.

An informal survey of online resources conducted by Team 8 found that the GA training resources typically contained one of two flaws: they either assumed that the reader has extensive knowledge in mathematics, or they fail to provide practical demonstrations. The former flaw presents GAs as a complex tool used exclusively by mathematically inclined professionals. Extensive mathematical jargon might confuse novice learners who have a weak grasp of mathematical notation and mathematical theorems. Moreover, large mathematical explanations could intimidate learners, discouraging them from pursuing an otherwise powerful tool for their work. The latter flaw illustrates GAs as a narrowly scoped tool used to solve specific problems. It fails to demonstrate the versatility of GAs and how GAs work to find the near-optimal solutions to problems without a clear optimal solution. Online resources in this category often use simple static examples, which hide the evolutionary process from the learner. This reduces the learner's appreciation for GAs, as they cannot see how the algorithms find the near-optimal solution. The key to learning is to keep the student engaged which current resources fail to do.

Ultimately, despite the versatility of GAs to find near-optimal solutions to problems in a variety of different industries, there continues to be a lack of accessible training resources for students and professionals to learn about GAs. This leaves many learners discouraged or impartial about the utility of these algorithms. Accordingly, there is a dire need for ways to teach both students and professionals about GAs in a manner that is both relevant and applicable to their daily lives.