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Genetic Algorithms - what they are and how to apply them to actuarial problems

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Genetic algorithms are being used in many scientific professions to solve problems too difficult to solve with standard deterministic techniques. A genetic algorithm is an inductive, rather than deductive approach that learns as it goes along. This session will give an in-depth look at genetic algorithms - what they are, why they are important for actuaries, when to use them, and how to create them. It starts with the origin of genetic algorithms and their relation to genetics. Next, it shows a couple of applications that teach the basic principles. Later, it shows an actuarial application where the genetic algorithm approach gives a higher degree of optimization than that achieved by more traditional actuarial techniques. Finally, it provides a set of guidelines for when and how to utilize them. At the conclusion of the session, attendees will be able to: apply simple genetic algorithms to actuarial problems; determine if a problem is suitable for the application of a genetic algorithm; develop further applications of genetic algorithms based on their own experiments and research; and explain genetic algorithms at a basic level to their colleagues.