

# Quiz - genetic algorithm theory

**Forfall** Ingen forfallsdato**Poeng** 7**Spørsmål** 7**Tidsbegrensning** Ingen**Tillatte forsøk** Ubegrenset

## Instruksjoner

This short quiz will test your knowledge of some key topics of genetic algorithms covered in the lectures.

[Ta quizen på nytt](#)

## Forsøkshistorikk

	Forsøk	Tid	Resultat
GJELDENDE	<a href="#">Forsøk 2</a>	2 minutter	7 av 7
SISTE	<a href="#">Forsøk 2</a>	2 minutter	7 av 7
	<a href="#">Forsøk 1</a>	2 minutter	6,75 av 7

Resultat for dette forsøket: **7** av 7

Innlevert 14. nov. i 10.36

Dette forsøket tok 2 minutter

### Spørsmål 1

**1 / 1 poeng**

What is the underlying theory of genetic algorithms?

- ☐ The theory of convolution
- ☐ The theory of planned obsolescence
- ☒ The theory of evolution

**Riktig!**

Correct. This method is inspired by the evolutionary processes found in nature, where creatures evolve and develop in order to survive and pass on their DNA to the next generation

- ☐ The theory of relativity

## Spørsmål 2

1 / 1 poeng

How do we represent potential solutions and their features in genetic algorithms?

- ☒ Chromosomes and genes

Correct. We model solutions as artificial chromosomes, with each feature of the solution encoded as genes.

- ☐ Genetic polymorphism and nuclear connections
- ☐ Edges and vertices
- ☐ Private keys and public tokens

Riktig!

## Spørsmål 3

1 / 1 poeng

Which of the following are operators in genetic algorithms? (You may pick multiple options)

- ☐ Transfiguration

**Riktig!**☒ Crossover

Correct. Crossover is the process of combining features of each parent in order to create offspring.

**Riktig!**☒ Inversion

Correct. This operator inverts random features of an individual.

**Riktig!**☒ Selection

Correct. Selection is the process of choosing the most fit individuals.

☐ Sublimation☐ Crossunder**Riktig!**☒ Mutation

Correct. Mutations change random features of an individual.

☐ Insubordination**Spørsmål 4****1 / 1 poeng**

How do we assign an individual's fitness in genetic algorithms?

**Riktig!**☒ Based on their ability to solve our problem☐ Based on their low mutation rate☐ Based on their genetic diversity

- ☐ Based on their number of features

**Spørsmål 5****1 / 1 poeng**

Why do we use mutations in genetic algorithms? (Select all the options you think are correct)

**Riktig!**

- ☒ Avoid getting stuck in local optimums

- ☐ Increase population fitness

**Riktig!**

- ☒ Introduce new feature values

- ☐ Eliminate bad solutions

**Riktig!**

- ☒ Ensure genetic diversity

- ☐ Solve the problem faster (convergence)

**Spørsmål 6****1 / 1 poeng**

Using roulette wheel selection, even individuals representing bad solutions may be selected for crossover. True or false?

- ☐ Usant

**Riktig!**

- ☒ Sant

This is not always bad in the long run. Roulette wheel selection keeps a number of less fit individuals around, which may in time prove to be the real answer to unforeseen challenges.

**Spørsmål 7****1 / 1 poeng**

Let's say that we increase the mutation chance to a very large value, i.e. that mutations happen on every feature on every crossover. Which of the following is most likely to happen?

- ☐ The population will get stuck in a local optimum
- ☐ The population will never converge to the optimal solution
- ☒ The population will take a long time to converge to an optimal solution

Correct. Initially, the population may move towards the goal faster if the mutations happen to be beneficial. However, since mutations are random, the population may "overshoot" the goal, and jump back and forth between sub-optimal solutions. In short, we become more dependent on the random values than the actual fitness.

- ☐ The population will always converge faster to the optimal solution

**Riktig!****Quizresultat: 7 av 7**