# SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
COIMBATORE-35
Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

# ARTIFICIAL INTELLIGENCE FOR ELECTRICAL ENGINEERING

## TOPIC : CROSS OVER AND MUTATION, GENERATIONAL CYCLE

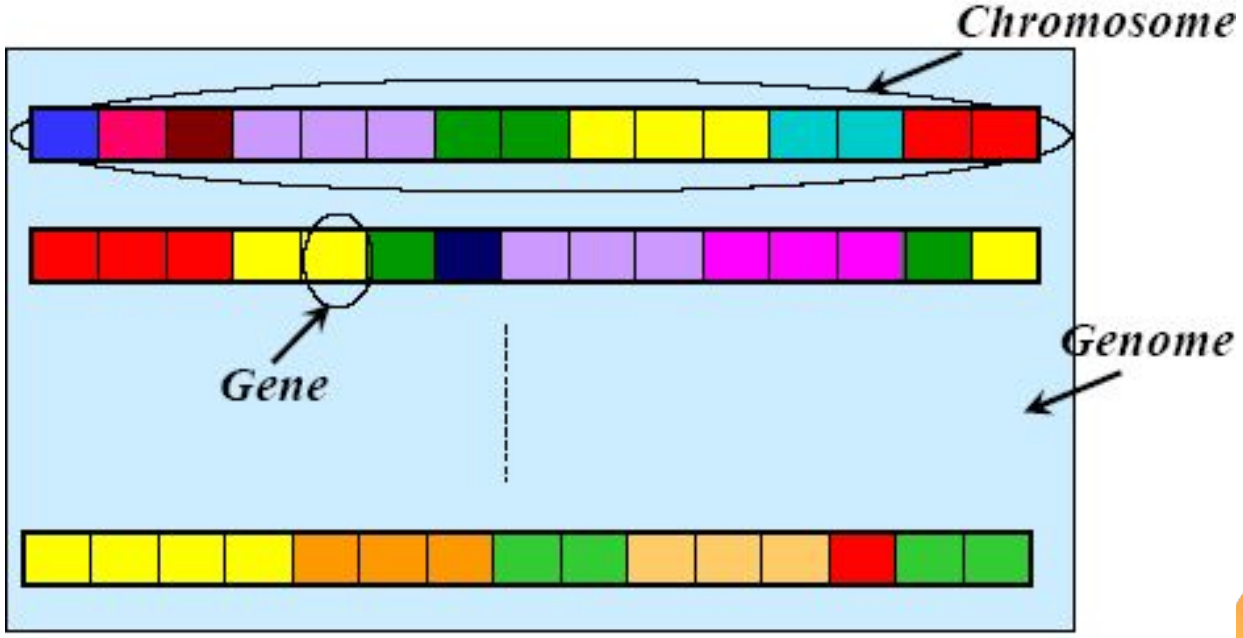
# INTRODUCTION

- After scientists became disillusioned with classical and neo-classical attempts at modeling intelligence, they looked in other directions.
- Two prominent fields arose, connectionism (neural networking, parallel processing) and evolutionary computing.
- It is the latter that this essay deals with - genetic algorithms and genetic programming.

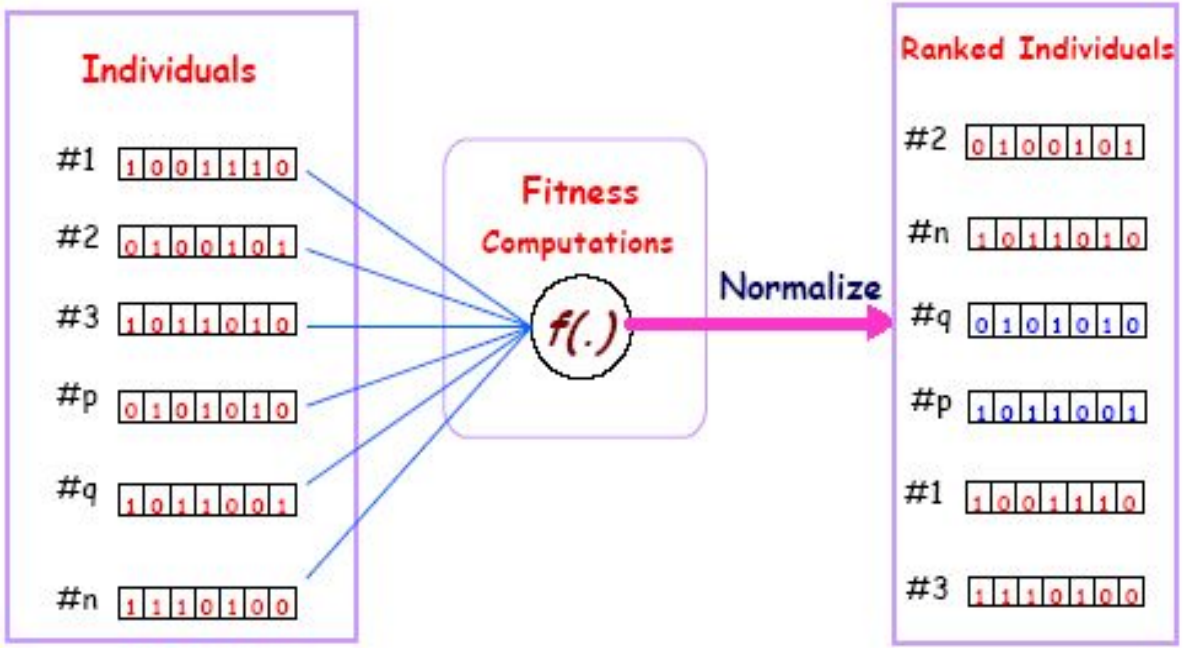
# WHAT IS GA

- A genetic algorithm (or GA) is a search technique used in computing to find true or approximate solutions to optimization and search problems.
- Genetic algorithms are categorized as global search heuristics.
- Genetic algorithms are a particular class of evolutionary algorithms that use techniques inspired by evolutionary biology such as inheritance, mutation, selection, and crossover (also called recombination).

# CHROMOSOME, GENES AND GENOMES



# A FITNESS FUNCTION



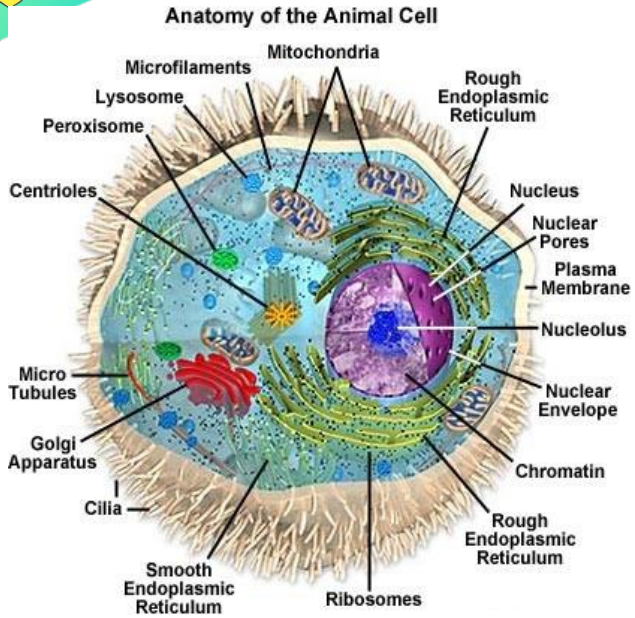
# CROSSOVER

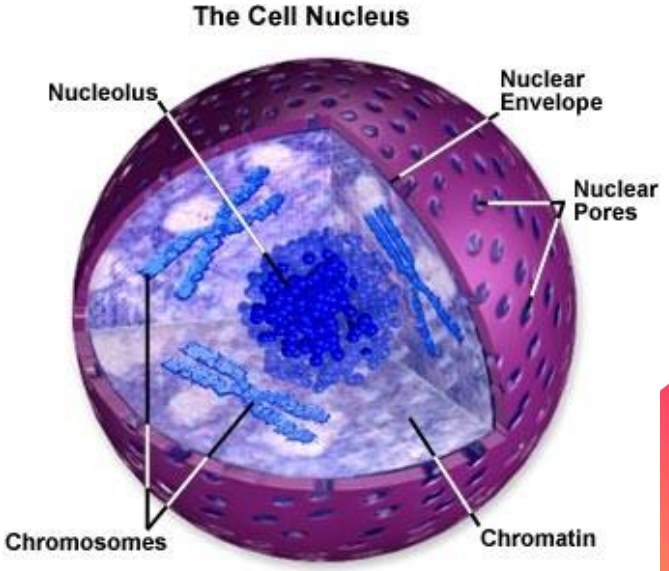
- The most common type is single point crossover. In single point crossover, you choose a locus at which you swap the remaining alleles from on parent to the other. This is complex and is best understood visually.
- As you can see, the children take one section of the chromosome from each parent.
- The point at which the chromosome is broken depends on the randomly selected crossover point.
- This particular method is called single point crossover because only one crossover point exists. Sometimes only child 1 or child 2 is created, but oftentimes both offspring are created and put into the new population.
- Crossover does not always occur, however. Sometimes, based on a set probability, no crossover occurs and the parents are copied directly to the new population. The probability of crossover occurring is usually 60% to 70%.

# CROSSOVER


Parent 1
1011010 01010011 0
Parent 2
0011010 11011010 1
Child 1
1011010 11011010 1
Child 2
0011010 01010011 0

# THANK YOU


Anatomy of the Animal Cell
Microfilaments
Mitochondria
Lysosome
Rough Endoplasmic Reticulum
Peroxisome
Centrioles
Nucleus
Nuclear Pores
Plasma Membrane
Nucleolus
Micro Tubules
Nuclear Envelope
Golgi Apparatus
Chromatin
Cilia
Rough Endoplasmic Reticulum
Smooth Endoplasmic Reticulum
Ribosomes


The Cell Nucleus
Nucleolus
Nuclear Envelope
Nuclear Pores
Chromosomes
Chromatin