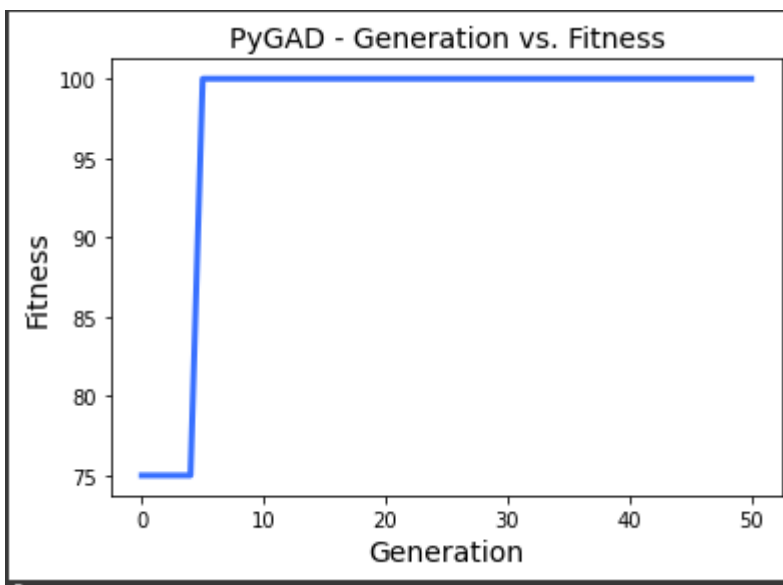


Solution :

Details :

- Name : P K Navin Shrinivas
- Section : D
- SRN : PES2UG20CS237

Code :



```
import numpy
import pygad
import pygad.nn
import pygad.gann
def fitness_func(solution, sol_idx):
    global GANN_instance, data_inputs, data_outputs
    predictions =
pygad.nn.predict(last_layer=GANN_instance.population_networks[sol_idx],

                  data_inputs=data_inputs)
    correct_predictions = numpy.where(predictions == data_outputs)
[0].size
    solution_fitness = (correct_predictions/data_outputs.size)*100
    return solution_fitness
def callback_generation(ga_instance):
    global GANN_instance
```

```

    population_matrices =
pygad.gann.population_as_matrices(population_networks=GANN_instance.popu

population_vectors=ga_instance.population)

GANN_instance.update_population_trained_weights(population_trained_weig

    print("Generation =
{generation}".format(generation=ga_instance.generations_completed))
    print("Accuracy    =
{fitness}".format(fitness=ga_instance.best_solution()[1]))
data_inputs = numpy.array([[1, 1],
                           [1, 0],
                           [0, 1],
                           [0, 0]])
data_outputs = numpy.array([0,
                             1,
                             1,
                             0])
GANN_instance = pygad.gann.GANN(num_solutions=5,
                                num_neurons_input=2,
                                num_neurons_hidden_layers=[2],
                                num_neurons_output=2,
                                hidden_activations=["relu"],
                                output_activation="softmax")

population_vectors =
pygad.gann.population_as_vectors(population_networks=GANN_instance.popu

ga_instance = pygad.GA(num_generations=50,
                       num_parents_mating=3,
                       initial_population=population_vectors.copy(),
                       fitness_func=fitness_func,
                       mutation_percent_genes=5,
                       callback_generation=callback_generation)

ga_instance.run()
ga_instance.plot_result()
solution, solution_fitness, solution_idx =
ga_instance.best_solution()
print(solution)
print(solution_fitness)
print(solution_idx)

```