

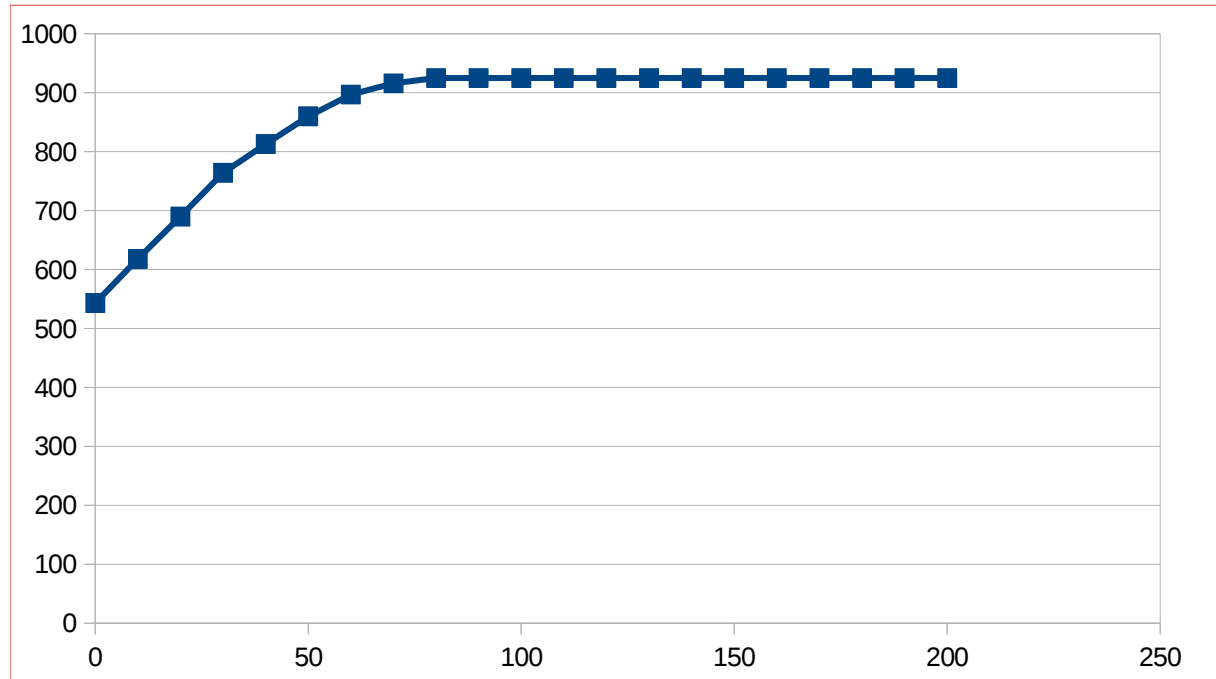
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Code(python):

```
import random
def get_fitness(chromosome):
    return chromosome.count(1)
def choice_parents(chromosomes):
    fitness_summ=0;
    for x in range (100):
        fitness_summ+=get_fitness(chromosomes[x])
    summ=0
    pr_chrom=[]
    for x in range (100):
        summ+=get_fitness(chromosomes[x])/fitness_summ
        pr_chrom.append(summ)
    parents=[]
    for _ in range (2):
        pr = float(random.randint(0, 998) / 1000)
        for x in range(100):
            #print(pr, pr_chrom[x])
            if pr<=pr_chrom[x]:
                parents.append(chromosomes[x])
                break
    return parents
def uniform_crossover(parents):
    child=[]
    for x in range(1000):
        point =random.randint(0,1)
        if point:
            child.append(parents[0][x])
        else:
            child.append(parents[1][x])
    #print(child)
    return child
def main():
    chromosomes=[[random.randint(0,1) for _ in range(1000)] for _ in range(100)]
    chromosomes.sort(key=get_fitness, reverse=True)
    population=0
    population_fitness=[]
    new_chromosomes=[]
    best_fitness=0
    f = open("res.txt", "w")
    while best_fitness<995 or population<1000:
        for _ in range(100):
            parents = choice_parents(chromosomes)
            child=uniform_crossover(parents)
            new_chromosomes.append(child)
        new_chromosomes.sort(key=get_fitness, reverse=True)
        population+=1
        best_fitness=get_fitness(new_chromosomes[0])
        average_fitness=get_fitness(new_chromosomes[99])
        population_fitness.append(best_fitness)
        if population%10==0:
            print("population:{0}\nbest fitness:{1}\naverage fitness:
{2}".format(population,
                best_fitness,
                average_fitness))
            f.write(str(best_fitness)+"\n")
```

```
chromosomes=new_chromosomes
new_chromosomes=[]
f.close()
#plot(population,population_fitness,'ro')
main()
```

truncate method



roulette method

