Gundic algorithm Alch1: Identify the objective function to obtinize . In this care maximize f(x)=x2 dich 2: Let the following farameters population sign as 100 mutation rate as 0,1 consover orate as 0,8 number of generations as 50, sower bound as 10, upper bound as 10 ateps: dynarale an initial furfulation of 100 sandom incliniduals within the range of 210 to 10 Step 4: For each individual in the population computerets
fitness using fitness function y(2)=x2

dep 5: Use Roulette wheel belection to beleet two percents
burn the hole weather from the foliation Steps: For the selected persons, jurjoin prossover with a stept: For cash offstowng apply mutation with a frebalility but &: Collect the newly oceaned off fring until the new quopulation roaches the original fisquiation suze dich9: Replace old population with new generation of individuals Step 10: After final generation evaluate gitners of the east profulation dep. 1: Prine dest bolution found and its fitness

mobiner transform def gitner-function (2): Lange of the work a ruturn XXX 2 del suntate (1, wereth , and the population - size = 100 of the real of () the exempt of the real of mutation-rak = 0. V Partom. uniform (hour) occassover—vate: 0.8 scotosan individuas num_generations: 50 god deuctic-ordonition (1) Lower-bound = - 10 formedian : governor . Just medical Colores might make def generate - pefulation (size, lower-bound, upper-bound): oceture (random renigor m (Lower Bound, upper bourd) for - in range (aign) (further on - roger on - rog def waluate-population (population):
vetwer (fitner-function (ind) for ind in population) de actect-parents (population, fitness). Lotal fitners: dum (fitners)

belection forons: If I lotal fitners for fin fitnerses)

faxents: transform. Ethoicus (fufulation weights:

Leuction, probs, k=1) [0] farert 2: trandom choices (profuection, weights = return parents, framents def currous (parent 1, faren 2, cross over-sove): y random. rendomic) 2 versover trave : com thurs ver- froint sandom trandom & bridge to make Child 1: crossover point & fragent 2 (1-crossover - proint) * frage childe: crossover point * provent 2 (1- crossover point) + frace return child 1, child with the Ethers of socialism is book with

enc: mojetral " scetium facents, facent 2 $\cdot(x)$ initialization \cdot (i.e., des mutare (1, m rate, lower-bound, upper-boura): of sandom. sandom () < m-rate: tuen india. uniform (bower-bound upper-cound) xetwen individual Janianions: 50 del genetic-augorithm (): population: generare populations population sex, lower bound , upper bound) for generation in range (num generations) new_h. () new . 17 while lan (now- 4) < graphereation and parents, parent 2 = delect. parents (furphation, fitnemen) Childs, childs = oconsover charents, flowers a, econows childs = neutate Capids, n. rate, lower-bound, upper-Child's mutate Child's, m-rate, lover-bound, uppernew propulation oxtend (child a child) population: new of i population aige? final fitnemer: evaluate froquete (froquetion) lest_individual: propulation spinal-gitnemes. indesc (max (final-fithenes)) brown 6 your f 13 mour hours and best - fitnes - marc (final fitnesses) xeturn but - individual, best gitness But solution. Dist gitness = genetic dosition () frent ("Best solution: ? best - adultion 4") fruit l'Fitness of adution: ? best-fitness")

Bortis awarden of invesations output: Best acalution found: +9.956292750107881 Fitnen of vire best ablution: 99,12776532 585076 diepas: du vitu paranutus in, co, co, co prius c of furnamed less furthirm and the in weight of gurboul tent first in atop 5. Define the winds within which fraidle common. stepy: Anign of with prandom velocity steps: for each particle colourate in pitron that in also pitron about our subject of also be update adodly southed in some very particle of also be update adodly southed in some very particle of at own & from barrow on the best velocity found by the enter swam step 7: It undergoes iterations to check the best downtrion grand dry 8: Then in the gina iteration it finds out the Do. + salve odocity = wa velocity + C3 * 5- * Brookgo noge (1204-front, out-trout that) it odels 1: dy june (E) cax rex (quori-intiportion reduce 2 x x a (resistion) dieg 3: Initialise hunarichers N=30, N=0.6, C1:1.5 , C2:1.5 siego: for each pathes introduce internsport and reporty randomin within the range [-10,10), 1-1. such it is the outbuste the fitting is stated sixty ar experience litely is so privately course of moon-collect controlation all are all son of our parties It out these is a secretary solder ourses beautiful the piet is rely no statistical expression part appropriate formal