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"""
Homework 1

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5 Last updated September, 1st 2014
"""

from __future__ import division
import sys, random, math, datetime, re, time
10 sys.dont_write_bytecode = True

rand=random.uniform
randi=random.randint
exp=math.exp
15 random.seed()

class simulatedAnnealing:

    def __init__(self):
20         pass

    def energy(self, x, emax, emin):
        f1=x**2
        f2=(x-2)**2
25         e=f1+f2
        e_norm=(e-emin)/(14379-emin)
        #print e_norm
        return e_norm

    def neighbour(self, x, xmin, xmax):
30         x_new=x+xmin+(xmax-xmin)*rand(0,1)
        return x_new

    def pAcceptance(self, e, en, t, k):
35         p=exp(-(en-e)/(k*t))
        print p
        return p

    f=open('output.log','w')
40     def say(self,x):
        self.f.write(str(x));
        sys.stdout.flush()

    # Initial temperature
45
    class main:

        k=1
        kmax=2000

50
        xmax=100;
        xmin=-100;
        emax=1;
        emin=0;

55
        sa=simulatedAnnealing()

        # Initial state and energy
        s=randi(-1000,1000)
        e=sa.energy(s,emax,emin)
60         print e
        # Initial best state and energy
        sb=s;
        eb=e;

65
        sa.say(sb)

        while (k<kmax):
            sn=sa.neighbour(s,xmax,xmin)
70             en=sa.energy(sn,emax,emin)
            t=k/kmax

            if en<eb:

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        sa.say('!!')
75         sb=sn
        eb=en

        if en<e:
            s=sn
            e=en
            sa.say('++')

            elif sa.pAcceptance(e, en, t, 0.01)>rand(0,1):
                s=sn
                e=en
85                 sa.say('--')

                sa.say('.')
                k=k+1
90                 if k%40==0: sa.say('\n'), sa.say(format(sb,'0.2f'))
                sa.say('\n'), sa.say('Best Value Found '), sa.say(format(sb,'0.2f'))
                print emax
                print emin
                print e
95                 print sb
            if __name__=='main':
                main()

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uesday September 02, 2014 output.log