In this lab, I implemented the Controlled Random Search method, which is a global minimization method. This method is based on the research of Price et al.(1977). The result of the method has been analyzed and compared with the BFGS method I implemented last lab.

The lab 8 folder includes
1. crs.cpp: the code of crs method
2. Readme: the documentation of the lab
3. Report.pdf: the writhing part of the lab
4. Bfgs.cpp: the bfgs method.
5. Makefile

To compile the code, type make in the terminal. To run the crs algorithm, type ./crs.x. To run the bfgs algorithm, type ./bfgs.x

Result:
Cloud after 4000 iterations, output in form:
X   y   f(x,y)
1 1 1.2326e-32
1 1 1.2326e-32
1 1 1.2326e-32
1 1 1.2326e-32
1 1 1.2326e-32
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Test case:
Cloud after 3000 iterations, output in form:
X   y   f(x,y)
1 1 2.07755e-20
1 1 2.30088e-22
1 1 4.85829e-22
1 1 1.50682e-21
1 1 1.56675e-21
1 1 1.6057e-21
1 1 1.81541e-21
1 1 2.0334e-21
1 1 2.03356e-21
1 1 2.27142e-21
1 1 2.98193e-21
1 1 3.14263e-21
1 1 6.4072e-21
1 1 7.38916e-21
1 1 7.74923e-21
1 1 7.84877e-21
1 1 7.89814e-21
1 1 8.22492e-21
1 1 8.79878e-21
1 1 9.56668e-21
1 1 1.01352e-20
1 1 1.01352e-20
1 1 1.02488e-20
1 1 1.06587e-20
1 1 1.06598e-20
1 1 1.12994e-20
1 1 1.14756e-20
1 1 1.14756e-20
1 1 1.19136e-20
1 1 1.2149e-20
1 1 1.24574e-20
1 1 1.24574e-20
1 1 1.24839e-20
1 1 1.29329e-20
1 1 1.30425e-20
1 1 1.30425e-20
1 1 1.43331e-20
1 1 1.43897e-20
1 1 1.47442e-20
1 1 1.62924e-20
1 1 1.63339e-20

1 1 1.64179e-20
1 1 1.71485e-20
1 1 1.83718e-20
1 1 1.95151e-20
1 1 2.00581e-20
1 1 2.0065e-20
1 1 2.04068e-20
1 1 2.0821e-20
1 1 2.20319e-20