| | 500// 1000 | 1000// 2000 | 2000// 5000 | 5000// 10000 | | 500// 1000 | 1000// 2000 | 2000// 5000 | 5000// 10000 | | 500// 1000 | 1000// 2000 | 2000// 5000 | 5000// 10000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| bb.ackley | -1 | 0 | 0 | 0 | bba.schwefel2_22 | -1 | 0 | 0 | 0 | gbestgc.quadric | -1 | 0 | 0 | 0 |
| bb.alpine | -1 | 0 | 0 | 0 | bba.schwefel2_26 | 0 | 0 | 0 | 0 | gbestgc.quartic | -1 | 0 | 0 | 0 |
| bb.eggholder | -1 | 0 | 0 | 0 | bba.sixhump | 0 | 0 | 0 | 0 | gbestgc.rastrigin | -1 | 0 | 0 | 0 |
| bb.elliptic | -1 | 0 | 0 | 0 | bba.spherical | -1 | 0 | 0 | 0 | gbestgc.rosenbrock | 1 | 0 | 0 | 0 |
| bb.goldsteinprice | -1 | 0 | 0 | 0 | bba.step | -1 | 0 | 0 | 0 | gbestgc.salomon | -1 | 0 | 0 | 0 |
| bb.griewank | -1 | 0 | 0 | 0 | bba.zakharov | -1 | 0 | 0 | 0 | gbestgc.schwefel1_2 | -1 | 0 | 0 | 0 |
| bb.levy | -1 | 0 | 0 | 0 | gbest.ackley | -1 | 0 | 0 | 0 | gbestgc.schwefel2_2 | -1 | 0 | 0 | 0 |
| bb.michalewicz | -1 | 0 | 0 | 0 | gbest.alpine | -1 | 0 | 0 | 0 | gbestgc.schwefel2_2 | -1 | 0 | 0 | 0 |
| bb.quadric | -1 | 0 | 0 | 0 | gbest.eggholder | -1 | 0 | 0 | 0 | gbestgc.sixhump | -1 | 0 | 0 | 0 |
| bb.quartic | -1 | -1 | 1 | -1 | gbest.elliptic | -1 | 0 | 0 | 0 | gbestgc.spherical | -1 | 0 | 0 | 0 |
| bb.rastrigin | -1 | 0 | 0 | 0 | gbest.goldsteinprice | -1 | 0 | 0 | 0 | gbestgc.step | -1 | 0 | 0 | 0 |
| bb.rosenbrock | 1 | 1 | -1 | 1 | gbest.griewank | -1 | 0 | 0 | 0 | gbestgc.zakharov | -1 | 0 | 0 | 0 |
| bb.salomon | -1 | 0 | 0 | 0 | gbest.levy | -1 | 0 | 0 | 0 | lbest.ackley | -1 | 0 | 0 | 0 |
| bb.schwefel1_2 | -1 | 0 | 0 | 0 | gbest.michalewicz | -1 | 0 | 0 | 0 | lbest.alpine | -1 | 0 | 0 | 0 |
| bb.schwefel2_22 | -1 | 0 | 0 | 0 | gbest.quadric | -1 | 0 | 0 | 0 | lbest.eggholder | 0 | 0 | 0 | 0 |
| bb.schwefel2_26 | -1 | 0 | 0 | 0 | gbest.quartic | -1 | 0 | 0 | 0 | lbest.elliptic | -1 | 0 | 0 | 0 |
| bb.sixhump | -1 | 0 | 0 | 0 | gbest.rastrigin | -1 | -1 | 0 | 0 | lbest.goldsteinprice | -1 | 0 | 0 | 0 |
| bb.spherical | -1 | 0 | 0 | 0 | gbest.rosenbrock | 1 | 0 | 0 | 0 | lbest.griewank | -1 | 0 | 0 | 0 |
| bb.step | -1 | 0 | 0 | 0 | gbest.salomon | -1 | 0 | 0 | 0 | lbest.levy | -1 | -1 | 1 | -1 |
| bb.zakharov | -1 | 0 | 0 | 0 | gbest.schwefel1_2 | -1 | 0 | 0 | 0 | lbest.michalewicz | -1 | 0 | 0 | 0 |
| bba.ackley | -1 | 0 | 0 | 0 | gbest.schwefel2_22 | -1 | 0 | 0 | 0 | lbest.quadric | -1 | 0 | 0 | 0 |
| bba.alpine | -1 | 0 | 0 | 0 | gbest.schwefel2_26 | -1 | 0 | 0 | 0 | lbest.quartic | -1 | 0 | 0 | 0 |
| bba.eggholder | 0 | 0 | 0 | 0 | gbest.sixhump | -1 | 0 | 0 | 0 | lbest.rastrigin | -1 | 0 | 0 | 0 |
| bba.elliptic | -1 | 0 | 0 | 0 | gbest.spherical | -1 | 0 | 0 | 0 | lbest.rosenbrock | -1 | 0 | 0 | 0 |
| bba.goldsteinprice | -1 | 0 | 0 | 0 | gbest.step | -1 | 0 | 0 | 0 | lbest.salomon | -1 | 0 | 0 | 0 |
| bba.griewank | -1 | 0 | 0 | 0 | gbest.zakharov | -1 | 0 | 0 | 0 | lbest.schwefel1_2 | -1 | 0 | 0 | 0 |
| bba.levy | -1 | 0 | 0 | 0 | gbestgc.ackley | -1 | 0 | 0 | 0 | lbest.schwefel2_22 | -1 | 0 | 0 | 0 |
| bba.michalewicz | -1 | 0 | 0 | 0 | gbestgc.alpine | -1 | 0 | 0 | 0 | lbest.schwefel2_26 | 0 | 0 | 0 | 0 |
| bba.quadric | -1 | 0 | 0 | 0 | gbestgc.eggholder | -1 | 0 | 0 | 0 | lbest.sixhump | 0 | 0 | 0 | 0 |
| bba.quartic | -1 | 0 | 0 | 0 | gbestgc.elliptic | -1 | 0 | 0 | 0 | lbest.spherical | -1 | 0 | 0 | 0 |
| bba.rastrigin | -1 | 0 | 0 | 0 | gbestgc.goldsteinprice | -1 | 0 | 0 | 0 | lbest.step | -1 | 0 | 0 | 0 |
| bba.rosenbrock | 1 | 0 | 0 | 0 | gbestgc.griewank | -1 | 1 | -1 | 1 | lbest.zakharov | -1 | 0 | 0 | 0 |
| bba.salomon | -1 | 0 | 0 | 0 | gbestgc.levy | -1 | 0 | 0 | 0 | lbestgc.ackley | -1 | 0 | 0 | 0 |
| bba.schwefel1_2 | -1 | 0 | 0 | 0 | gbestgc.michalewicz | -1 | 0 | 0 | 0 | lbestgc.alpine | -1 | 0 | 0 | 0 |

| | 500// 1000 | 1000// 2000 | 2000// 5000 | 5000// 10000 | | 500// 1000 | 1000// 2000 | 2000// 5000 | 5000// 10000 | | 500// 1000 | 1000// 2000 | 2000// 5000 | 5000// 10000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| lbestgc.eggholder | -1 | 0 | 0 | 0 | spso.sixhump | -1 | 0 | 0 | 0 | vngc.rastrigin | -1 | 0 | 0 | 0 |
| lbestgc.elliptic | -1 | 0 | 0 | 0 | spso.spherical | -1 | 0 | 0 | 0 | vngc.rosenbrock | -1 | 0 | 0 | 0 |
| lbestgc.goldsteinprice | -1 | 0 | 0 | 0 | spso.step | -1 | 0 | 0 | 0 | vngc.salomon | -1 | 0 | 0 | 0 |
| lbestgc.griewank | -1 | 0 | 0 | 0 | spso.zakharov | -1 | 0 | 0 | 0 | vngc.schwefel1_2 | -1 | 0 | 0 | 0 |
| lbestgc.levy | -1 | 0 | 0 | 0 | vn.ackley | -1 | 0 | 0 | 0 | vngc.schwefel2_22 | -1 | 0 | 0 | 0 |
| lbestgc.michalewicz | -1 | 0 | 0 | 0 | vn.alpine | -1 | 0 | 0 | 0 | vngc.schwefel2_26 | -1 | 0 | 0 | 0 |
| lbestgc.quadric | -1 | 0 | 0 | 0 | vn.eggholder | -1 | 0 | 0 | 0 | vngc.sixhump | -1 | 0 | 0 | 0 |
| lbestgc.quartic | -1 | 0 | 0 | 0 | vn.elliptic | -1 | 1 | -1 | 1 | vngc.spherical | -1 | 0 | 0 | 0 |
| lbestgc.rastrigin | -1 | 0 | 0 | 0 | vn.goldsteinprice | -1 | -1 | 1 | 0 | vngc.step | -1 | 0 | 0 | 0 |
| lbestgc.rosenbrock | -1 | 0 | 0 | 0 | vn.griewank | -1 | 0 | 0 | 0 | vngc.zakharov | -1 | 0 | 0 | 0 |
| lbestgc.salomon | -1 | 0 | 0 | 0 | vn.levy | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.schwefel1_2 | -1 | 0 | 0 | 0 | vn.michalewicz | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.schwefel2_22 | -1 | 0 | 0 | 0 | vn.quadric | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.schwefel2_26 | -1 | 0 | 0 | 0 | vn.quartic | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.sixhump | -1 | 0 | 0 | 0 | vn.rastrigin | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.spherical | -1 | 0 | 0 | 0 | vn.rosenbrock | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.step | -1 | 0 | 0 | 0 | vn.salomon | -1 | 0 | 0 | 0 | | | | | |
| lbestgc.zakharov | -1 | 0 | 0 | 0 | vn.schwefel1_2 | -1 | 0 | 0 | 0 | | | | | |
| spso.ackley | -1 | 0 | 0 | 0 | vn.schwefel2_22 | -1 | 1 | -1 | 1 | | | | | |
| spso.alpine | -1 | 0 | 0 | 0 | vn.schwefel2_26 | 0 | 0 | 0 | 0 | | | | | |
| spso.eggholder | -1 | 0 | 0 | 0 | vn.sixhump | 0 | 0 | 0 | 0 | | | | | |
| spso.elliptic | -1 | 0 | 0 | 0 | vn.spherical | -1 | 0 | 0 | 0 | | | | | |
| spso.goldsteinprice | -1 | 0 | 0 | 0 | vn.step | -1 | 0 | 0 | 0 | | | | | |
| spso.griewank | -1 | 0 | 0 | 0 | vn.zakharov | -1 | 0 | 0 | 0 | | | | | |
| spso.levy | -1 | 0 | 0 | 0 | vngc.ackley | -1 | 0 | 0 | 0 | | | | | |
| spso.michalewicz | -1 | 0 | 0 | 0 | vngc.alpine | -1 | 0 | 0 | 0 | | | | | |
| spso.quadric | -1 | 0 | 0 | 0 | vngc.eggholder | 0 | 0 | 0 | 0 | | | | | |
| spso.quartic | -1 | 0 | 0 | 0 | vngc.elliptic | -1 | 0 | 0 | 0 | | | | | |
| spso.rastrigin | -1 | 1 | -1 | 1 | vngc.goldsteinprice | -1 | 0 | 0 | 0 | | | | | |
| spso.rosenbrock | -1 | 0 | 0 | 0 | vngc.griewank | -1 | -1 | 1 | -1 | | | | | |
| spso.salomon | -1 | 0 | 0 | 0 | vngc.levy | -1 | 0 | 0 | 0 | | | | | |
| spso.schwefel1_2 | -1 | 0 | 0 | 0 | vngc.michalewicz | 0 | 0 | 0 | 0 | | | | | |
| spso.schwefel2_22 | -1 | 0 | 0 | 0 | vngc.quadric | -1 | 0 | 0 | 0 | | | | | |
| spso.schwefel2_26 | -1 | 0 | 0 | 0 | vngc.quartic | -1 | 0 | 0 | 0 | | | | | |