============Start Ensemble Strategy============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20151002

======A2C Training========

Training time (A2C): 0.060125509897867836 minutes

======A2C Validation from: 20151002 to 20160104

A2C Sharpe Ratio: -0.0820204305989861

======PPO Training========

Training time (PPO): 0.1455684701601664 minutes

======PPO Validation from: 20151002 to 20160104

PPO Sharpe Ratio: -0.03820628402615059

======DDPG Training========

Training time (DDPG): 0.1920054038365682 minutes

======DDPG Validation from: 20151002 to 20160104

======Trading from: 20160104 to 20160405

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE7A0C9DA0>

previous\_total\_asset:1000000

end\_total\_asset:1053074.1039214088

total\_reward:53074.103921408765

total\_cost: 1473.5147727750305

total trades: 986

Sharpe: 0.15437526851677458

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20160104

======A2C Training========

Training time (A2C): 0.0923754612604777 minutes

======A2C Validation from: 20160104 to 20160405

A2C Sharpe Ratio: -0.10892892813546595

======PPO Training========

Training time (PPO): 0.24101528724034627 minutes

======PPO Validation from: 20160104 to 20160405

PPO Sharpe Ratio: 0.11368268942315646

======DDPG Training========

Training time (DDPG): 0.3548690398534139 minutes

======DDPG Validation from: 20160104 to 20160405

======Trading from: 20160405 to 20160705

Used Model: <stable\_baselines.ppo2.ppo2.PPO2 object at 0x000001DE7A1E0908>

previous\_total\_asset:1053074.1039214088

end\_total\_asset:1059853.9744943352

total\_reward:6779.870572926477

total\_cost: 7099.174046023493

total trades: 1642

Sharpe: 0.031232355706535996

============Trading Done============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20160405

======A2C Training========

Training time (A2C): 0.059965670108795166 minutes

======A2C Validation from: 20160405 to 20160705

A2C Sharpe Ratio: -0.01158709807998276

======PPO Training========

Training time (PPO): 0.12489526271820069 minutes

======PPO Validation from: 20160405 to 20160705

PPO Sharpe Ratio: -0.025467926416231513

======DDPG Training========

Training time (DDPG): 0.22370814482371013 minutes

======DDPG Validation from: 20160405 to 20160705

======Trading from: 20160705 to 20161003

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE7A26B358>

previous\_total\_asset:1059853.9744943352

end\_total\_asset:1046358.7790278777

total\_reward:-13495.195466457517

total\_cost: 1313.3951332920487

total trades: 817

Sharpe: -0.0615632879674693

============Trading Done============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20160705

======A2C Training========

Training time (A2C): 0.05740544001261393 minutes

======A2C Validation from: 20160705 to 20161003

A2C Sharpe Ratio: -0.043404636869165535

======PPO Training========

Training time (PPO): 0.12209807634353638 minutes

======PPO Validation from: 20160705 to 20161003

PPO Sharpe Ratio: -0.13205824352335718

======DDPG Training========

Training time (DDPG): 0.24835811058680216 minutes

======DDPG Validation from: 20160705 to 20161003

======Trading from: 20161003 to 20170103

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE048514E0>

previous\_total\_asset:1046358.7790278777

end\_total\_asset:1174250.1712111018

total\_reward:127891.39218322409

total\_cost: 998.2111909821621

total trades: 1023

Sharpe: 0.5731719059038931

============Trading Done============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20161003

======A2C Training========

Training time (A2C): 0.0574504295984904 minutes

======A2C Validation from: 20161003 to 20170103

A2C Sharpe Ratio: 0.4776228281030425

======PPO Training========

Training time (PPO): 0.12630478541056314 minutes

======PPO Validation from: 20161003 to 20170103

PPO Sharpe Ratio: 0.3608292946125418

======DDPG Training========

Training time (DDPG): 0.22013179063796998 minutes

======DDPG Validation from: 20161003 to 20170103

======Trading from: 20170103 to 20170404

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE02EEE0F0>

previous\_total\_asset:1174250.1712111018

end\_total\_asset:1151928.0982472224

total\_reward:-22322.072963879444

total\_cost: 942.8921380253097

total trades: 980

Sharpe: -0.07789328519798625

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20170103

======A2C Training========

Training time (A2C): 0.09803834358851114 minutes

======A2C Validation from: 20170103 to 20170404

A2C Sharpe Ratio: 0.19866220218219172

======PPO Training========

Training time (PPO): 0.1374584158261617 minutes

======PPO Validation from: 20170103 to 20170404

PPO Sharpe Ratio: 0.277776943719001

======DDPG Training========

Training time (DDPG): 0.2183414101600647 minutes

======DDPG Validation from: 20170103 to 20170404

======Trading from: 20170404 to 20170705

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE7EADD940>

previous\_total\_asset:1151928.0982472224

end\_total\_asset:1145266.4911161822

total\_reward:-6661.607131040189

total\_cost: 3629.526177071271

total trades: 1018

Sharpe: -0.03642508032713948

============Trading Done============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20170404

======A2C Training========

Training time (A2C): 0.06832265059153239 minutes

======A2C Validation from: 20170404 to 20170705

A2C Sharpe Ratio: 0.27650321990920956

======PPO Training========

Training time (PPO): 0.14673220713933308 minutes

======PPO Validation from: 20170404 to 20170705

PPO Sharpe Ratio: 0.09382563379149585

======DDPG Training========

Training time (DDPG): 0.24629724820454915 minutes

======DDPG Validation from: 20170404 to 20170705

======Trading from: 20170705 to 20171003

Used Model: <stable\_baselines.a2c.a2c.A2C object at 0x000001DE7A1D27B8>

previous\_total\_asset:1145266.4911161822

end\_total\_asset:1167732.6057494613

total\_reward:22466.114633279154

total\_cost: 9384.997526191735

total trades: 1696

Sharpe: 0.19117465320104418

============Trading Done============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20170705

======A2C Training========

Training time (A2C): 0.07300464312235515 minutes

======A2C Validation from: 20170705 to 20171003

A2C Sharpe Ratio: 0.14266499948190756

======PPO Training========

Training time (PPO): 0.11705722014109293 minutes

======PPO Validation from: 20170705 to 20171003

PPO Sharpe Ratio: 0.36209757617312255

======DDPG Training========

Training time (DDPG): 0.18688458998998006 minutes

======DDPG Validation from: 20170705 to 20171003

======Trading from: 20171003 to 20180103

Used Model: <stable\_baselines.ppo2.ppo2.PPO2 object at 0x000001DE7A073A20>

previous\_total\_asset:1167732.6057494613

end\_total\_asset:1271803.164058011

total\_reward:104070.55830854969

total\_cost: 11364.815670574317

total trades: 1738

Sharpe: 0.6619993925859374

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20171003

======A2C Training========

Training time (A2C): 0.06534056266148885 minutes

======A2C Validation from: 20171003 to 20180103

A2C Sharpe Ratio: 0.14900144395364281

======PPO Training========

Training time (PPO): 0.1603780746459961 minutes

======PPO Validation from: 20171003 to 20180103

PPO Sharpe Ratio: 0.6520211943898062

======DDPG Training========

Training time (DDPG): 0.18430272340774537 minutes

======DDPG Validation from: 20171003 to 20180103

======Trading from: 20180103 to 20180405

Used Model: <stable\_baselines.ppo2.ppo2.PPO2 object at 0x000001DE00286D68>

previous\_total\_asset:1271803.164058011

end\_total\_asset:1292641.2721875636

total\_reward:20838.108129552566

total\_cost: 1910.207625591035

total trades: 382

Sharpe: 0.22294044224632623

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20180103

======A2C Training========

Training time (A2C): 0.04953584671020508 minutes

======A2C Validation from: 20180103 to 20180405

A2C Sharpe Ratio: -0.007734415820820309

======PPO Training========

Training time (PPO): 0.19001878499984742 minutes

======PPO Validation from: 20180103 to 20180405

PPO Sharpe Ratio: -0.08866404781785875

======DDPG Training========

Training time (DDPG): 0.21649168729782103 minutes

======DDPG Validation from: 20180103 to 20180405

======Trading from: 20180405 to 20180705

Used Model: <stable\_baselines.a2c.a2c.A2C object at 0x000001DE0027B978>

previous\_total\_asset:1292641.2721875636

end\_total\_asset:1285522.2440534197

total\_reward:-7119.028134143911

total\_cost: 6691.724111160877

total trades: 1122

Sharpe: -0.06057334708411862

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20180405

======A2C Training========

Training time (A2C): 0.0546661098798116 minutes

======A2C Validation from: 20180405 to 20180705

A2C Sharpe Ratio: -0.07938662996825938

======PPO Training========

Training time (PPO): 0.17710717916488647 minutes

======PPO Validation from: 20180405 to 20180705

PPO Sharpe Ratio: -0.30845846006660327

======DDPG Training========

Training time (DDPG): 0.28015676736831663 minutes

======DDPG Validation from: 20180405 to 20180705

======Trading from: 20180705 to 20181003

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE04B0B8D0>

previous\_total\_asset:1285522.2440534197

end\_total\_asset:1306203.2847540074

total\_reward:20681.040700587677

total\_cost: 5342.1264584771825

total trades: 803

Sharpe: 0.17943144512663306

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20180705

======A2C Training========

Training time (A2C): 0.05577085812886556 minutes

======A2C Validation from: 20180705 to 20181003

A2C Sharpe Ratio: 0.20063224913598596

======PPO Training========

Training time (PPO): 0.1271786053975423 minutes

======PPO Validation from: 20180705 to 20181003

PPO Sharpe Ratio: 0.06797013878811704

======DDPG Training========

Training time (DDPG): 0.25212322473526 minutes

======DDPG Validation from: 20180705 to 20181003

======Trading from: 20181003 to 20190104

Used Model: <stable\_baselines.a2c.a2c.A2C object at 0x000001DE031D7DD8>

previous\_total\_asset:1306203.2847540074

end\_total\_asset:1315990.7861071206

total\_reward:9787.501353113214

total\_cost: 807.2780384066245

total trades: 186

Sharpe: 0.2268322989674482

============Trading Done============

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turbulence\_threshold: 171.0940715631016

======Model training from: 20090000 to 20181003

======A2C Training========

Training time (A2C): 0.058266647656758624 minutes

======A2C Validation from: 20181003 to 20190104

A2C Sharpe Ratio: -0.39513396299173725

======PPO Training========

Training time (PPO): 0.1058070182800293 minutes

======PPO Validation from: 20181003 to 20190104

PPO Sharpe Ratio: -0.30612171430291335

======DDPG Training========

Training time (DDPG): 0.17865105470021567 minutes

======DDPG Validation from: 20181003 to 20190104

======Trading from: 20190104 to 20190405

Used Model: <stable\_baselines.ppo2.ppo2.PPO2 object at 0x000001DE7FDBCF98>

previous\_total\_asset:1315990.7861071206

end\_total\_asset:1387779.4863010056

total\_reward:71788.70019388502

total\_cost: 11212.919948969484

total trades: 1714

Sharpe: 0.3323128248801968

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20190104

======A2C Training========

Training time (A2C): 0.05271481275558472 minutes

======A2C Validation from: 20190104 to 20190405

A2C Sharpe Ratio: 0.15420723409030707

======PPO Training========

Training time (PPO): 0.21110797723134359 minutes

======PPO Validation from: 20190104 to 20190405

PPO Sharpe Ratio: 0.03136269759426065

======DDPG Training========

Training time (DDPG): 0.22808630069096883 minutes

======DDPG Validation from: 20190104 to 20190405

======Trading from: 20190405 to 20190708

Used Model: <stable\_baselines.a2c.a2c.A2C object at 0x000001DE04AFAF98>

previous\_total\_asset:1387779.4863010056

end\_total\_asset:1390991.1470947408

total\_reward:3211.66079373518

total\_cost: 922.114667031045

total trades: 155

Sharpe: 0.2829505112516445

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20190405

======A2C Training========

Training time (A2C): 0.0540726105372111 minutes

======A2C Validation from: 20190405 to 20190708

A2C Sharpe Ratio: 0.09231246940354759

======PPO Training========

Training time (PPO): 0.15924142996470134 minutes

======PPO Validation from: 20190405 to 20190708

PPO Sharpe Ratio: 0.22677650027058102

======DDPG Training========

Training time (DDPG): 0.23728962341944376 minutes

======DDPG Validation from: 20190405 to 20190708

======Trading from: 20190708 to 20191004

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE046725C0>

previous\_total\_asset:1390991.1470947408

end\_total\_asset:1398456.3738675818

total\_reward:7465.226772841066

total\_cost: 1648.9425624292753

total trades: 208

Sharpe: 0.17300905228481445

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20190708

======A2C Training========

Training time (A2C): 0.055618099371592206 minutes

======A2C Validation from: 20190708 to 20191004

A2C Sharpe Ratio: 0.04986280113270497

======PPO Training========

Training time (PPO): 0.1665966232617696 minutes

======PPO Validation from: 20190708 to 20191004

PPO Sharpe Ratio: -0.20841588916923928

======DDPG Training========

Training time (DDPG): 0.21317893664042156 minutes

======DDPG Validation from: 20190708 to 20191004

======Trading from: 20191004 to 20200106

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE02AA6F98>

previous\_total\_asset:1398456.3738675818

end\_total\_asset:1396188.5739281464

total\_reward:-2267.799939435441

total\_cost: 477.6064845148469

total trades: 82

Sharpe: -0.4324289680004482

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20191004

======A2C Training========

Training time (A2C): 0.07003467877705892 minutes

======A2C Validation from: 20191004 to 20200106

A2C Sharpe Ratio: -0.4254318956370936

======PPO Training========

Training time (PPO): 0.1880915363629659 minutes

======PPO Validation from: 20191004 to 20200106

PPO Sharpe Ratio: -0.10724926671621794

======DDPG Training========

Training time (DDPG): 0.2238053838411967 minutes

======DDPG Validation from: 20191004 to 20200106

======Trading from: 20200106 to 20200406

Used Model: <stable\_baselines.ddpg.ddpg.DDPG object at 0x000001DE048917F0>

previous\_total\_asset:1396188.5739281464

end\_total\_asset:1370294.960122426

total\_reward:-25893.61380572035

total\_cost: 1346.2825572368627

total trades: 141

Sharpe: -0.3981030559672985

============Trading Done============

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turbulence\_threshold: 96.08032158358223

======Model training from: 20090000 to 20200106

======A2C Training========

Training time (A2C): 0.07947683731714884 minutes

======A2C Validation from: 20200106 to 20200406

A2C Sharpe Ratio: -0.41161016515341525

======PPO Training========

Training time (PPO): 0.16461586952209473 minutes

======PPO Validation from: 20200106 to 20200406

PPO Sharpe Ratio: -0.4066088739612093

======DDPG Training========

Training time (DDPG): 0.20096486806869507 minutes

======DDPG Validation from: 20200106 to 20200406

======Trading from: 20200406 to 20200707

Used Model: <stable\_baselines.ppo2.ppo2.PPO2 object at 0x000001DE04CC9C18>

previous\_total\_asset:1370294.960122426

end\_total\_asset:1372585.7194942893

total\_reward:2290.7593718632124

total\_cost: 476.7821283185888

total trades: 120

Sharpe: 0.17996390022199002

============Trading Done============

Ensemble Strategy took: 8.833323609828948 minutes