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

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9168676813443501 minutes

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

A2C Sharpe Ratio: -0.08570547571062571

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

Training time (PPO): 3.061791145801544 minutes

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

PPO Sharpe Ratio: -0.01352271009769736

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

Training time (DDPG): 0.5384067138036092 minutes

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

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

previous\_total\_asset:1000000

end\_total\_asset:1067904.0626242212

total\_reward:67904.0626242212

total\_cost: 1831.304604073842

total trades: 894

Sharpe: 0.2125017049495161

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1340994517008463 minutes

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

A2C Sharpe Ratio: 0.18556700025544265

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

Training time (PPO): 3.1301245292027793 minutes

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

PPO Sharpe Ratio: 0.2420104819725336

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

Training time (DDPG): 0.5571565628051758 minutes

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

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

previous\_total\_asset:1067904.0626242212

end\_total\_asset:1092502.4834502623

total\_reward:24598.42082604114

total\_cost: 3578.5714958309445

total trades: 1321

Sharpe: 0.0998887805030583

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9305173714955648 minutes

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

A2C Sharpe Ratio: 0.172782682194444

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

Training time (PPO): 3.06783322095871 minutes

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

PPO Sharpe Ratio: 0.028715361475254463

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

Training time (DDPG): 0.5820204337437948 minutes

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

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

previous\_total\_asset:1092502.4834502623

end\_total\_asset:1082585.4967941025

total\_reward:-9916.986656159861

total\_cost: 1067.9686295830898

total trades: 909

Sharpe: -0.03709653357883789

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9288455406824748 minutes

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

A2C Sharpe Ratio: -0.002352287216968474

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

Training time (PPO): 3.1078141887982684 minutes

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

PPO Sharpe Ratio: 0.05306031187206349

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

Training time (DDPG): 0.5632570624351502 minutes

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

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

previous\_total\_asset:1082585.4967941025

end\_total\_asset:1108882.4208135651

total\_reward:26296.92401946266

total\_cost: 5320.453582437148

total trades: 1534

Sharpe: 0.12312213520073831

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9762262582778931 minutes

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

A2C Sharpe Ratio: 0.5572173591513057

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

Training time (PPO): 3.1463534037272134 minutes

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

PPO Sharpe Ratio: 0.26409493787090643

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

Training time (DDPG): 0.5790587623914083 minutes

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

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

previous\_total\_asset:1108882.4208135651

end\_total\_asset:1138996.3467186696

total\_reward:30113.925905104494

total\_cost: 3091.460392392674

total trades: 1124

Sharpe: 0.18153317465730026

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 0.9361314058303833 minutes

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

A2C Sharpe Ratio: 0.16418523022301607

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

Training time (PPO): 3.1015533963839212 minutes

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

PPO Sharpe Ratio: 0.25853506317307834

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

Training time (DDPG): 0.5960377931594849 minutes

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

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

previous\_total\_asset:1138996.3467186696

end\_total\_asset:1165406.2786718297

total\_reward:26409.931953160092

total\_cost: 3153.398277785206

total trades: 906

Sharpe: 0.19224360871498933

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 1.0070999344189961 minutes

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

A2C Sharpe Ratio: 0.11955877501992924

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

Training time (PPO): 3.1709293127059937 minutes

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

PPO Sharpe Ratio: 0.15909524476925443

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

Training time (DDPG): 0.5670326193173726 minutes

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

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

previous\_total\_asset:1165406.2786718297

end\_total\_asset:1181507.469797492

total\_reward:16101.191125662299

total\_cost: 2153.9035543224145

total trades: 1159

Sharpe: 0.09357502082715485

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.943809183438619 minutes

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

A2C Sharpe Ratio: 0.07197923322079247

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

Training time (PPO): 3.171820139884949 minutes

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

PPO Sharpe Ratio: 0.2774673552679408

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

Training time (DDPG): 0.5660820007324219 minutes

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

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

previous\_total\_asset:1181507.469797492

end\_total\_asset:1311787.689757175

total\_reward:130280.21995968302

total\_cost: 6986.3274636011365

total trades: 1358

Sharpe: 0.8064404169482711

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.080260451634725 minutes

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

A2C Sharpe Ratio: 0.39293541559786177

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

Training time (PPO): 3.66323002576828 minutes

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

PPO Sharpe Ratio: 0.5659318477966132

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

Training time (DDPG): 0.6028938968976338 minutes

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

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

previous\_total\_asset:1311787.689757175

end\_total\_asset:1321342.2770618396

total\_reward:9554.587304664543

total\_cost: 2004.7828703309622

total trades: 270

Sharpe: 0.047081052057697435

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.0845579703648884 minutes

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

A2C Sharpe Ratio: 0.046082618490671974

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

Training time (PPO): 3.638502836227417 minutes

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

PPO Sharpe Ratio: -0.007870678759670032

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

Training time (DDPG): 0.6193263729413351 minutes

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

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

previous\_total\_asset:1321342.2770618396

end\_total\_asset:1321990.2907014748

total\_reward:648.0136396351736

total\_cost: 5619.559018371501

total trades: 1090

Sharpe: 0.008087237778329334

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.0744884133338928 minutes

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

A2C Sharpe Ratio: -0.2461052451727758

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

Training time (PPO): 3.5809889912605284 minutes

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

PPO Sharpe Ratio: -0.12879527998417692

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

Training time (DDPG): 0.6160512765248617 minutes

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

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

previous\_total\_asset:1321990.2907014748

end\_total\_asset:1356724.0807976811

total\_reward:34733.79009620636

total\_cost: 5428.864209763986

total trades: 648

Sharpe: 0.27550666669855606

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.0787888805071513 minutes

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

A2C Sharpe Ratio: 0.13280259505475545

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

Training time (PPO): 3.64603982369105 minutes

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

PPO Sharpe Ratio: 0.03456381823960311

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

Training time (DDPG): 0.6113369862238566 minutes

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

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

previous\_total\_asset:1356724.0807976811

end\_total\_asset:1375867.0063726085

total\_reward:19142.925574927358

total\_cost: 1174.398914832063

total trades: 151

Sharpe: 0.3069504181745667

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 1.094250456492106 minutes

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

A2C Sharpe Ratio: -0.42765262766669915

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

Training time (PPO): 14.22872177362442 minutes

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

PPO Sharpe Ratio: -0.45255207047057316

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

Training time (DDPG): 0.6355768799781799 minutes

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

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

previous\_total\_asset:1375867.0063726085

end\_total\_asset:1499309.0871850455

total\_reward:123442.080812437

total\_cost: 1885.7176684501692

total trades: 947

Sharpe: 0.410696727338877

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.0944987257321677 minutes

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

A2C Sharpe Ratio: 0.12166701644518269

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

Training time (PPO): 3.7535614530245462 minutes

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

PPO Sharpe Ratio: -0.10466683017405239

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

Training time (DDPG): 0.6182363390922546 minutes

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

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

previous\_total\_asset:1499309.0871850455

end\_total\_asset:1506360.6257119793

total\_reward:7051.538526933873

total\_cost: 1355.7640412522899

total trades: 115

Sharpe: 0.24215023725304083

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1154826203982036 minutes

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

A2C Sharpe Ratio: 0.16755323057431792

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

Training time (PPO): 3.6614734172821044 minutes

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

PPO Sharpe Ratio: 0.06294351679458018

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

Training time (DDPG): 0.6220910390218098 minutes

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

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

previous\_total\_asset:1506360.6257119793

end\_total\_asset:1513844.7773710778

total\_reward:7484.151659098454

total\_cost: 2952.686473131523

total trades: 310

Sharpe: 0.08654828019183908

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1527016520500184 minutes

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

A2C Sharpe Ratio: -0.03751221610262664

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

Training time (PPO): 3.736742536226908 minutes

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

PPO Sharpe Ratio: -0.12236384088256504

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

Training time (DDPG): 0.6165707667668661 minutes

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

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

previous\_total\_asset:1513844.7773710778

end\_total\_asset:1513629.5843021523

total\_reward:-215.19306892552413

total\_cost: 401.45851607757567

total trades: 62

Sharpe: -0.03451669889470416

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.117151955763499 minutes

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

A2C Sharpe Ratio: -0.0958408830686628

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

Training time (PPO): 3.706681156158447 minutes

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

PPO Sharpe Ratio: -0.3967007963929692

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

Training time (DDPG): 0.6212975700696309 minutes

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

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

previous\_total\_asset:1513629.5843021523

end\_total\_asset:1499087.188936483

total\_reward:-14542.39536566916

total\_cost: 748.6071633853364

total trades: 164

Sharpe: -0.39697696415352957

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1230233430862426 minutes

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

A2C Sharpe Ratio: -0.42698267766162823

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

Training time (PPO): 3.8719531695048013 minutes

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

PPO Sharpe Ratio: -0.4688586232337031

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

Training time (DDPG): 0.6428230086962382 minutes

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

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

previous\_total\_asset:1499087.188936483

end\_total\_asset:1503109.1863934891

total\_reward:4021.997457006015

total\_cost: 480.2774475686884

total trades: 106

Sharpe: 0.22878412457715894

Ensemble Strategy took: 102.20727174282074 minutes

Process finished with exit code 0