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

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9334140419960022 minutes

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

A2C Sharpe Ratio: -0.03950209978533809

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

Training time (PPO): 3.27844656308492 minutes

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

PPO Sharpe Ratio: -0.1363965650254135

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

Training time (DDPG): 0.6256356954574585 minutes

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

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

previous\_total\_asset:1000000

end\_total\_asset:1054169.9510690973

total\_reward:54169.95106909727

total\_cost: 1445.3053271231367

total trades: 982

Sharpe: 0.17314827173293776

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.0277008096377054 minutes

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

A2C Sharpe Ratio: 0.05470301152996318

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

Training time (PPO): 3.343616509437561 minutes

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

PPO Sharpe Ratio: 0.14821617065201745

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

Training time (DDPG): 0.6207441250483196 minutes

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

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

previous\_total\_asset:1054169.9510690973

end\_total\_asset:1097745.2315131307

total\_reward:43575.280444033444

total\_cost: 3227.641869042596

total trades: 1302

Sharpe: 0.1489309724897043

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9425970514615377 minutes

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

A2C Sharpe Ratio: 0.026270680119478355

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

Training time (PPO): 3.1493757605552672 minutes

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

PPO Sharpe Ratio: 0.1889975759774299

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

Training time (DDPG): 0.5892678658167522 minutes

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

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

previous\_total\_asset:1097745.2315131307

end\_total\_asset:1067217.5938052495

total\_reward:-30527.637707881164

total\_cost: 1656.2596004319062

total trades: 1194

Sharpe: -0.10054285831365643

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.938841986656189 minutes

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

A2C Sharpe Ratio: -0.04025329680634894

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

Training time (PPO): 3.3109991192817687 minutes

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

PPO Sharpe Ratio: -0.03554880688967245

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

Training time (DDPG): 0.6027116417884827 minutes

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

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

previous\_total\_asset:1067217.5938052495

end\_total\_asset:1117571.623264737

total\_reward:50354.029459487414

total\_cost: 670.8576654972284

total trades: 1001

Sharpe: 0.184598254018178

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9558252215385437 minutes

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

A2C Sharpe Ratio: 0.35850435385186513

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

Training time (PPO): 3.180505335330963 minutes

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

PPO Sharpe Ratio: 0.503338863671458

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

Training time (DDPG): 0.6221200108528138 minutes

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

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

previous\_total\_asset:1117571.623264737

end\_total\_asset:1052614.246456629

total\_reward:-64957.37680810806

total\_cost: 3193.401108628546

total trades: 1310

Sharpe: -0.25434008662158913

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 0.9640244563420614 minutes

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

A2C Sharpe Ratio: 0.1530084115344311

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

Training time (PPO): 3.1795360883076986 minutes

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

PPO Sharpe Ratio: 0.172744128556161

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

Training time (DDPG): 0.5984782536824544 minutes

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

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

previous\_total\_asset:1052614.246456629

end\_total\_asset:1072226.8334693753

total\_reward:19612.58701274637

total\_cost: 4970.480174490082

total trades: 1160

Sharpe: 0.1607960791421741

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9684860666592916 minutes

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

A2C Sharpe Ratio: 0.31919792860050406

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

Training time (PPO): 3.236850047111511 minutes

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

PPO Sharpe Ratio: 0.1916686624332812

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

Training time (DDPG): 0.5993619680404663 minutes

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

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

previous\_total\_asset:1072226.8334693753

end\_total\_asset:1146606.6709267846

total\_reward:74379.83745740936

total\_cost: 7455.10093516448

total trades: 1493

Sharpe: 0.5009555505748856

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 0.9744183421134949 minutes

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

A2C Sharpe Ratio: 0.15833472407072272

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

Training time (PPO): 3.3816837151845296 minutes

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

PPO Sharpe Ratio: 0.44579825924747973

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

Training time (DDPG): 0.6100812832514445 minutes

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

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

previous\_total\_asset:1146606.6709267846

end\_total\_asset:1278022.3425779291

total\_reward:131415.6716511445

total\_cost: 6857.012589063795

total trades: 1392

Sharpe: 0.6528846998940572

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.104358474413554 minutes

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

A2C Sharpe Ratio: 0.48069149809551637

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

Training time (PPO): 3.6559595982233684 minutes

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

PPO Sharpe Ratio: 0.3946413291153216

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

Training time (DDPG): 0.6641779104868571 minutes

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

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

previous\_total\_asset:1278022.3425779291

end\_total\_asset:1308524.5454053362

total\_reward:30502.202827407047

total\_cost: 1623.2585552971661

total trades: 310

Sharpe: 0.22627322007920356

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1094419757525127 minutes

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

A2C Sharpe Ratio: -0.016227452215945855

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

Training time (PPO): 3.756902821858724 minutes

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

PPO Sharpe Ratio: 0.05402631332731508

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

Training time (DDPG): 0.646223803361257 minutes

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

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

previous\_total\_asset:1308524.5454053362

end\_total\_asset:1293192.908188196

total\_reward:-15331.63721714029

total\_cost: 6736.8244111851445

total trades: 1120

Sharpe: -0.06306111107493424

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1197598695755004 minutes

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

A2C Sharpe Ratio: -0.05662491419776897

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

Training time (PPO): 3.732706880569458 minutes

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

PPO Sharpe Ratio: 0.046818540753497104

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

Training time (DDPG): 0.6736684560775756 minutes

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

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

previous\_total\_asset:1293192.908188196

end\_total\_asset:1301882.603979238

total\_reward:8689.695791042177

total\_cost: 5982.543044503632

total trades: 969

Sharpe: 0.11958726369861633

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1189888397852579 minutes

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

A2C Sharpe Ratio: 0.1651814192473743

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

Training time (PPO): 3.7087607820828756 minutes

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

PPO Sharpe Ratio: 0.029744853398094333

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

Training time (DDPG): 0.6518315156300862 minutes

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

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

previous\_total\_asset:1301882.603979238

end\_total\_asset:1318894.4868868964

total\_reward:17011.88290765835

total\_cost: 1298.6149008294356

total trades: 151

Sharpe: 0.22118580531001233

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turbulence\_threshold: 171.09407156310598

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

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

Training time (A2C): 1.1195444544156392 minutes

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

A2C Sharpe Ratio: -0.29542524842342666

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

Training time (PPO): 3.7353395501772564 minutes

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

PPO Sharpe Ratio: -0.3516824993650641

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

Training time (DDPG): 0.6626234014829 minutes

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

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

previous\_total\_asset:1318894.4868868964

end\_total\_asset:1315542.129554241

total\_reward:-3352.3573326554615

total\_cost: 4893.339085018462

total trades: 1424

Sharpe: 0.00255113591214408

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1279854416847228 minutes

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

A2C Sharpe Ratio: 0.09808552251581741

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

Training time (PPO): 3.7578030149141948 minutes

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

PPO Sharpe Ratio: 0.11227213128336014

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

Training time (DDPG): 0.6645967801411946 minutes

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

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

previous\_total\_asset:1315542.129554241

end\_total\_asset:1319290.580838894

total\_reward:3748.4512846530415

total\_cost: 962.1667300675468

total trades: 135

Sharpe: 0.18637223692764443

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.129028073946635 minutes

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

A2C Sharpe Ratio: 0.22542463694897466

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

Training time (PPO): 3.700425640741984 minutes

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

PPO Sharpe Ratio: -0.25493594539137004

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

Training time (DDPG): 0.6619867563247681 minutes

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

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

previous\_total\_asset:1319290.580838894

end\_total\_asset:1321723.7423086371

total\_reward:2433.1614697431214

total\_cost: 1741.4717237877662

total trades: 317

Sharpe: 0.09008349199932125

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.141059112548828 minutes

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

A2C Sharpe Ratio: 0.008897629092017311

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

Training time (PPO): 3.781607707341512 minutes

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

PPO Sharpe Ratio: -0.06024127600410011

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

Training time (DDPG): 0.6575005809466045 minutes

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

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

previous\_total\_asset:1321723.7423086371

end\_total\_asset:1321731.7639144564

total\_reward:8.0216058192309

total\_cost: 323.5932723564005

total trades: 64

Sharpe: 0.0020839946398127935

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1458051760991415 minutes

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

A2C Sharpe Ratio: -0.19405443554884222

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

Training time (PPO): 3.769300421079 minutes

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

PPO Sharpe Ratio: -0.0916055611337919

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

Training time (DDPG): 0.6667706171671549 minutes

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

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

previous\_total\_asset:1321731.7639144564

end\_total\_asset:1304879.7329500336

total\_reward:-16852.030964422738

total\_cost: 1236.7804416410306

total trades: 155

Sharpe: -0.34048590043141996

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turbulence\_threshold: 96.08032158358422

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

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

Training time (A2C): 1.1384534041086833 minutes

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

A2C Sharpe Ratio: -0.3665243533140146

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

Training time (PPO): 3.801054318745931 minutes

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

PPO Sharpe Ratio: -0.3817408706745167

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

Training time (DDPG): 0.6626515070597331 minutes

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

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

previous\_total\_asset:1304879.7329500336

end\_total\_asset:1310835.1634956764

total\_reward:5955.430545642739

total\_cost: 705.107406851597

total trades: 103

Sharpe: 0.2736498070056221

Ensemble Strategy took: 94.1294832587242 minutes