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

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

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

Training time (A2C): 0.6572443962097168 minutes

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

A2C Sharpe Ratio: -0.15243489353357378

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

Training time (PPO): 2.1489120284716288 minutes

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

PPO Sharpe Ratio: -0.145714757570551

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

Training time (DDPG): 0.44389679431915285 minutes

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

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

previous\_total\_asset:1000000

end\_total\_asset:1001674.4419999998

total\_reward:1674.4419999998063

total\_cost: 131.558

total trades: 22

Sharpe: 0.21490780766808854

previous\_total\_asset:1000000

end\_total\_asset:1001674.4419999998

total\_reward:1674.4419999998063

total\_cost: 131.558

total trades: 22

Sharpe: 0.21490780766808854

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

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

Training time (A2C): 0.6429744521776836 minutes

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

A2C Sharpe Ratio: 0.21254240190345283

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

Training time (PPO): 2.188148776690165 minutes

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

PPO Sharpe Ratio: 0.21490780766807582

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

Training time (DDPG): 0.47752503951390585 minutes

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

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

previous\_total\_asset:1001506.8089999999

end\_total\_asset:1007230.6173228871

total\_reward:5723.808322887169

total\_cost: 102.30744755859375

total trades: 18

Sharpe: 0.23040561114366073

previous\_total\_asset:1001506.8089999999

end\_total\_asset:1007230.6173228871

total\_reward:5723.808322887169

total\_cost: 102.30744755859375

total trades: 18

Sharpe: 0.23040561114366073

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

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

Training time (A2C): 0.71365753809611 minutes

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

A2C Sharpe Ratio: -0.6910684150560628

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

Training time (PPO): 2.5089269797007243 minutes

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

PPO Sharpe Ratio: 0.4239309724690294

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

Training time (DDPG): 0.6173866987228394 minutes

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

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

previous\_total\_asset:1007231.0929595671

end\_total\_asset:1007266.1435657386

total\_reward:35.050606171484105

total\_cost: 66.47357474489688

total trades: 20

Sharpe: 0.03781457349925651

previous\_total\_asset:1007231.0929595671

end\_total\_asset:1006820.549504321

total\_reward:-410.54345524613746

total\_cost: 73.23358108110905

total trades: 22

Sharpe: -0.4835526743756341

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

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

Training time (A2C): 0.8377459088961283 minutes

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

A2C Sharpe Ratio: -0.12958928013242166

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

Training time (PPO): 2.9491507768630982 minutes

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

PPO Sharpe Ratio: -0.11185509155793252

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

Training time (DDPG): 0.6113010168075561 minutes

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

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

previous\_total\_asset:1007309.3933245586

end\_total\_asset:1009402.0769322633

total\_reward:2092.6836077047046

total\_cost: 133.89039665946962

total trades: 22

Sharpe: 0.2711094103148971

previous\_total\_asset:1007309.3933245586

end\_total\_asset:1009675.4981473251

total\_reward:2366.1048227665015

total\_cost: 145.16254562644957

total trades: 22

Sharpe: 0.2630171170845101

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

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

Training time (A2C): 0.7913406689961752 minutes

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

A2C Sharpe Ratio: 0.029636576586957245

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

Training time (PPO): 2.8542090892791747 minutes

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

PPO Sharpe Ratio: 0.43588840771950027

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

Training time (DDPG): 0.5058204730351766 minutes

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

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

previous\_total\_asset:1011584.4301089802

end\_total\_asset:1016720.3874256553

total\_reward:5135.957316675107

total\_cost: 92.57391810085298

total trades: 13

Sharpe: 0.3741292927915501

previous\_total\_asset:1011584.4301089802

end\_total\_asset:1016720.3874256553

total\_reward:5135.957316675107

total\_cost: 92.57391810085298

total trades: 13

Sharpe: 0.3741292927915501

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

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

Training time (A2C): 0.8452958504358927 minutes

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

A2C Sharpe Ratio: -0.10515319418490332

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

Training time (PPO): 2.652195851008097 minutes

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

PPO Sharpe Ratio: -0.10063997692506914

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

Training time (DDPG): 0.5187785585721334 minutes

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

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

previous\_total\_asset:1016720.3874256553

end\_total\_asset:1024076.5417291316

total\_reward:7356.154303476331

total\_cost: 165.34823391728398

total trades: 22

Sharpe: 1.1480143362428932

previous\_total\_asset:1016720.3874256553

end\_total\_asset:1024574.3398002908

total\_reward:7853.952374635497

total\_cost: 171.82151009020805

total trades: 22

Sharpe: 1.1387224821669515

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

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

Training time (A2C): 0.7795752207438151 minutes

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

A2C Sharpe Ratio: 0.6953947385236011

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

Training time (PPO): 2.8482800205548604 minutes

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

PPO Sharpe Ratio: 1.154765084203212

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

Training time (DDPG): 0.514614192644755 minutes

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

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

previous\_total\_asset:1019409.4394256553

end\_total\_asset:1040636.094274803

total\_reward:21226.654849147657

total\_cost: 183.40737787261966

total trades: 22

Sharpe: 0.9195816089086805

previous\_total\_asset:1019409.4394256553

end\_total\_asset:1040272.5270515401

total\_reward:20863.0876258848

total\_cost: 170.71144986665252

total trades: 22

Sharpe: 0.9136675079689772

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

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

Training time (A2C): 0.902608581384023 minutes

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

A2C Sharpe Ratio: 0.3533039234796616

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

Training time (PPO): 2.693860491116842 minutes

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

PPO Sharpe Ratio: 0.9594740592851214

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

Training time (DDPG): 0.6362489898999532 minutes

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

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

previous\_total\_asset:1032473.0799053365

end\_total\_asset:1064706.2791604544

total\_reward:32233.199255117914

total\_cost: 216.79193602096555

total trades: 22

Sharpe: 0.4502076779735171

previous\_total\_asset:1032473.0799053365

end\_total\_asset:1064706.2791604544

total\_reward:32233.199255117914

total\_cost: 216.79193602096555

total trades: 22

Sharpe: 0.4502076779735171

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

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

Training time (A2C): 0.8646806756655375 minutes

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

A2C Sharpe Ratio: 0.05280433574383211

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

Training time (PPO): 2.6428635080655414 minutes

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

PPO Sharpe Ratio: 0.07447369458545564

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

Training time (DDPG): 0.48517478704452516 minutes

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

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

previous\_total\_asset:1062764.744997085

end\_total\_asset:1041262.5259875881

total\_reward:-21502.21900949697

total\_cost: 207.68048273307804

total trades: 22

Sharpe: -0.35658903534387726

previous\_total\_asset:1062764.744997085

end\_total\_asset:1041262.5259875881

total\_reward:-21502.21900949697

total\_cost: 207.68048273307804

total trades: 22

Sharpe: -0.35658903534387726

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

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

Training time (A2C): 0.6923106431961059 minutes

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

A2C Sharpe Ratio: -0.10210024531775302

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

Training time (PPO): 2.3673127333323163 minutes

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

PPO Sharpe Ratio: -0.08558806317155343

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

Training time (DDPG): 0.45964244604110716 minutes

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

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

previous\_total\_asset:1039157.7405045324

end\_total\_asset:1052399.6716570428

total\_reward:13241.931152510457

total\_cost: 217.4259907772065

total trades: 22

Sharpe: 0.21380564926399787

previous\_total\_asset:1039157.7405045324

end\_total\_asset:1052399.6716570428

total\_reward:13241.931152510457

total\_cost: 217.4259907772065

total trades: 22

Sharpe: 0.21380564926399787

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

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

Training time (A2C): 0.6581502119700114 minutes

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

A2C Sharpe Ratio: -0.19722552467235807

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

Training time (PPO): 2.1474857131640115 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.4516783912976583 minutes

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

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

previous\_total\_asset:1055729.5491589732

end\_total\_asset:1102114.9638652191

total\_reward:46385.414706245996

total\_cost: 98.76834183071138

total trades: 22

Sharpe: 0.4855382236126683

previous\_total\_asset:1055729.5491589732

end\_total\_asset:1102114.9638652191

total\_reward:46385.414706245996

total\_cost: 98.76834183071138

total trades: 22

Sharpe: 0.4855382236126683

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

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

Training time (A2C): 0.6661225040753682 minutes

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

A2C Sharpe Ratio: 0.03574799944543118

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

Training time (PPO): 2.4138739188512166 minutes

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

PPO Sharpe Ratio: 0.023161212477681315

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

Training time (DDPG): 0.4621423602104187 minutes

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

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

previous\_total\_asset:1109947.3142801668

end\_total\_asset:1002769.4074813233

total\_reward:-107177.90679884341

total\_cost: 216.41199373626714

total trades: 22

Sharpe: -0.6310095770389497

previous\_total\_asset:1109947.3142801668

end\_total\_asset:1004874.4756029332

total\_reward:-105072.83867723355

total\_cost: 206.78640668762208

total trades: 22

Sharpe: -0.6311318872214101

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

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

Training time (A2C): 0.684911024570465 minutes

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

A2C Sharpe Ratio: -0.6019166493718597

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

Training time (PPO): 3.2660227974255878 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.5013514081637065 minutes

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

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

previous\_total\_asset:978632.4552862425

end\_total\_asset:1120093.8253469197

total\_reward:141461.37006067717

total\_cost: 242.53499188011168

total trades: 22

Sharpe: 0.43242392578263317

previous\_total\_asset:978632.4552862425

end\_total\_asset:1120093.8253469197

total\_reward:141461.37006067717

total\_cost: 242.53499188011168

total trades: 22

Sharpe: 0.43242392578263317

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

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

Training time (A2C): 0.7490429759025574 minutes

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

A2C Sharpe Ratio: -0.0415117611129233

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

Training time (PPO): 2.627155872186025 minutes

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

PPO Sharpe Ratio: -0.055992664309285144

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

Training time (DDPG): 0.4862910588582357 minutes

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

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

previous\_total\_asset:1110455.422163558

end\_total\_asset:1245601.3043638314

total\_reward:135145.88220027345

total\_cost: 270.0649914703369

total trades: 22

Sharpe: 0.6830926697494283

previous\_total\_asset:1110455.422163558

end\_total\_asset:1245601.3043638314

total\_reward:135145.88220027345

total\_cost: 270.0649914703369

total trades: 22

Sharpe: 0.6830926697494283

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

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

Training time (A2C): 0.7835728446642558 minutes

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

A2C Sharpe Ratio: 0.2638211846736322

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

Training time (PPO): 2.6371721188227335 minutes

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

PPO Sharpe Ratio: 0.232881074681354

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

Training time (DDPG): 0.6203388810157776 minutes

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

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

previous\_total\_asset:1233546.5416936388

end\_total\_asset:1144587.6860159782

total\_reward:-88958.85567766055

total\_cost: 260.1199241817474

total trades: 22

Sharpe: -0.6061890966277933

previous\_total\_asset:1233546.5416936388

end\_total\_asset:1144587.6860159782

total\_reward:-88958.85567766055

total\_cost: 260.1199241817474

total trades: 22

Sharpe: -0.6061890966277933

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

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

Training time (A2C): 0.7956101179122925 minutes

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

A2C Sharpe Ratio: -0.5538435594308317

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

Training time (PPO): 2.707151484489441 minutes

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

PPO Sharpe Ratio: -0.5741529656067998

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

Training time (DDPG): 0.5037809451421101 minutes

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

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

previous\_total\_asset:1203414.7973858393

end\_total\_asset:1247645.5692752146

total\_reward:44230.77188937529

total\_cost: 247.085300413456

total trades: 22

Sharpe: 0.39448720945128773

previous\_total\_asset:1203414.7973858393

end\_total\_asset:1249159.4515724757

total\_reward:45744.65418663644

total\_cost: 247.92500497207644

total trades: 22

Sharpe: 0.4027546206103779

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

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

Training time (A2C): 0.8527640581130982 minutes

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

A2C Sharpe Ratio: 0.11322998555010627

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

Training time (PPO): 2.595428133010864 minutes

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

PPO Sharpe Ratio: 0.2829311380392423

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

Training time (DDPG): 0.6853326837221781 minutes

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

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

previous\_total\_asset:1251675.6819698585

end\_total\_asset:779991.1065919191

total\_reward:-471684.5753779394

total\_cost: 118.00283807929993

total trades: 22

Sharpe: -0.4165603599355896

previous\_total\_asset:1251675.6819698585

end\_total\_asset:779991.1065919191

total\_reward:-471684.5753779394

total\_cost: 118.00283807929993

total trades: 22

Sharpe: -0.4165603599355896

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

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

Training time (A2C): 0.7728782018025716 minutes

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

A2C Sharpe Ratio: -0.35323941488168553

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

Training time (PPO): 3.192270024617513 minutes

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

PPO Sharpe Ratio: -0.42916849463917717

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

Training time (DDPG): 0.6456294457117716 minutes

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

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

previous\_total\_asset:976657.7820206409

end\_total\_asset:1002419.7982131392

total\_reward:25762.016192498268

total\_cost: 165.80377895399093

total trades: 22

Sharpe: 0.09583113282658003

previous\_total\_asset:976657.7820206409

end\_total\_asset:1002555.1520038607

total\_reward:25897.369983219774

total\_cost: 150.20990349143028

total trades: 22

Sharpe: 0.09615053225063061

Ensemble Strategy took: 71.1270867784818 minutes