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

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

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

Training time (A2C): 0.6396988113721211 minutes

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

A2C Sharpe Ratio: -0.4341428688689941

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

Training time (PPO): 2.74434517621994 minutes

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

PPO Sharpe Ratio: -0.23247278824855205

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

Training time (DDPG): 0.493160072962443 minutes

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

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

previous\_total\_asset:1000000

df\_total\_value['daily\_return'].std()

end\_total\_asset:1000000.0

total\_reward:0.0

total\_cost: 0

total trades: 0

Sharpe: nan

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

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

Training time (A2C): 0.6347627600034078 minutes

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

A2C Sharpe Ratio: 0.18455075048572658

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

Training time (PPO): 2.8264301896095274 minutes

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

PPO Sharpe Ratio: 0.18701260052476573

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

Training time (DDPG): 0.5311722119649251 minutes

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

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

previous\_total\_asset:1000000.0

end\_total\_asset:992721.3821232193

total\_reward:-7278.617876780685

total\_cost: 171.77689793921942

total trades: 62

Sharpe: -0.1450909505593766

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

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

Training time (A2C): 0.9505714575449625 minutes

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

A2C Sharpe Ratio: -0.12961293853460382

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

Training time (PPO): 3.0192587773005166 minutes

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

PPO Sharpe Ratio: -0.13603900156779009

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

Training time (DDPG): 0.46849952538808187 minutes

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

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

previous\_total\_asset:992721.3821232193

end\_total\_asset:997172.0838116324

total\_reward:4450.701688413043

total\_cost: 398.68879438911443

total trades: 62

Sharpe: 0.04704981179055932

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

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

Training time (A2C): 0.8054991841316224 minutes

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

A2C Sharpe Ratio: 0.24095418900589255

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

Training time (PPO): 2.672489011287689 minutes

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

PPO Sharpe Ratio: -0.01809584020525836

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

Training time (DDPG): 0.5344829599062602 minutes

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

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

previous\_total\_asset:997172.0838116324

end\_total\_asset:1076467.9559181817

total\_reward:79295.87210654933

total\_cost: 384.22873170193657

total trades: 62

Sharpe: 0.31293173269613295

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

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

Training time (A2C): 0.9184218804041545 minutes

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

A2C Sharpe Ratio: 0.3817572983542758

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

Training time (PPO): 2.8379732926686603 minutes

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

PPO Sharpe Ratio: 0.41588276256208645

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

Training time (DDPG): 0.576459260781606 minutes

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

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

previous\_total\_asset:1076467.9559181817

end\_total\_asset:1113800.5770944129

total\_reward:37332.62117623119

total\_cost: 300.01400982865334

total trades: 62

Sharpe: 0.19770833719456718

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

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

Training time (A2C): 0.7706379612286886 minutes

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

A2C Sharpe Ratio: 0.028734659947484274

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

Training time (PPO): 2.773719044526418 minutes

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

PPO Sharpe Ratio: 0.037805594938838276

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

Training time (DDPG): 0.5636274774869283 minutes

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

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

previous\_total\_asset:1113800.5770944129

end\_total\_asset:1204491.358884322

total\_reward:90690.78178990912

total\_cost: 391.22176515745167

total trades: 62

Sharpe: 0.2986463623090279

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

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

Training time (A2C): 0.7284856677055359 minutes

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

A2C Sharpe Ratio: 0.5846121426479529

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

Training time (PPO): 2.4703017433484393 minutes

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

PPO Sharpe Ratio: 0.5740077018494588

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

Training time (DDPG): 0.5022297104199728 minutes

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

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

previous\_total\_asset:1204491.358884322

end\_total\_asset:1280561.2842936798

total\_reward:76069.92540935776

total\_cost: 420.62624248023263

total trades: 62

Sharpe: 0.28341089440899714

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

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

Training time (A2C): 0.6696246266365051 minutes

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

A2C Sharpe Ratio: 0.40676887030782155

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

Training time (PPO): 2.8431214809417726 minutes

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

PPO Sharpe Ratio: 0.40865128671808815

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

Training time (DDPG): 1.0005807836850484 minutes

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

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

previous\_total\_asset:1280561.2842936798

end\_total\_asset:1399274.4184591211

total\_reward:118713.13416544138

total\_cost: 7.405830000000001

total trades: 62

Sharpe: 0.3974911276331469

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

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

Training time (A2C): 0.9746752222379048 minutes

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

A2C Sharpe Ratio: 0.27732884172894845

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

Training time (PPO): 3.017458772659302 minutes

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

PPO Sharpe Ratio: 0.28010860107240027

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

Training time (DDPG): 0.5119248827298483 minutes

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

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

previous\_total\_asset:1399274.4184591211

end\_total\_asset:1336666.2679146065

total\_reward:-62608.15054451465

total\_cost: 540.2508915184784

total trades: 62

Sharpe: -0.08449659006008943

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

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

Training time (A2C): 0.8747684240341187 minutes

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

A2C Sharpe Ratio: -0.06474487199872207

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

Training time (PPO): 3.1713762958844502 minutes

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

PPO Sharpe Ratio: -0.0968583311609722

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

Training time (DDPG): 0.6347294569015502 minutes

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

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

previous\_total\_asset:1336666.2679146065

end\_total\_asset:1374150.7718943693

total\_reward:37484.50397976278

total\_cost: 553.026385900116

total trades: 62

Sharpe: 0.09998460223516345

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

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

Training time (A2C): 0.7843851407368978 minutes

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

A2C Sharpe Ratio: -0.06281991372032385

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

Training time (PPO): 2.7774410446484885 minutes

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

PPO Sharpe Ratio: -0.04240150383631748

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

Training time (DDPG): 0.5185529947280884 minutes

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

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

previous\_total\_asset:1374150.7718943693

end\_total\_asset:1466076.727401722

total\_reward:91925.95550735272

total\_cost: 646.3263986393737

total trades: 62

Sharpe: 0.3590648606740219

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

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

Training time (A2C): 0.7310722708702088 minutes

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

A2C Sharpe Ratio: 0.2772052930546596

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

Training time (PPO): 2.8755200346310934 minutes

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

PPO Sharpe Ratio: 0.29263788560112725

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

Training time (DDPG): 0.4654204924901327 minutes

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

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

previous\_total\_asset:1466076.727401722

end\_total\_asset:1359489.3273615758

total\_reward:-106587.4000401462

total\_cost: 471.598918367834

total trades: 62

Sharpe: -0.25273413039513754

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

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

Training time (A2C): 0.5832980235417684 minutes

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

A2C Sharpe Ratio: -0.2881261649112589

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

Training time (PPO): 2.0140984296798705 minutes

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

PPO Sharpe Ratio: -0.2808833691864151

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

Training time (DDPG): 0.4364384690920512 minutes

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

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

previous\_total\_asset:1359489.3273615758

end\_total\_asset:1517749.0780867971

total\_reward:158259.75072522135

total\_cost: 623.7802168299102

total trades: 62

Sharpe: 0.4785923888269834

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

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

Training time (A2C): 0.5868921081225077 minutes

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

A2C Sharpe Ratio: 0.1313638879941796

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

Training time (PPO): 2.0190349419911704 minutes

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

PPO Sharpe Ratio: 0.23518221884596807

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

Training time (DDPG): 0.4387991746266683 minutes

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

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

previous\_total\_asset:1517749.0780867971

end\_total\_asset:1728341.679319383

total\_reward:210592.60123258596

total\_cost: 0.0

total trades: 62

Sharpe: 0.4510249712352188

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

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

Training time (A2C): 0.5831546584765116 minutes

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

A2C Sharpe Ratio: 0.3751024903092907

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

Training time (PPO): 2.0149283051490783 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.4340750932693481 minutes

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

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

previous\_total\_asset:1728341.679319383

end\_total\_asset:1604856.340468157

total\_reward:-123485.33885122603

total\_cost: 731.7830434517672

total trades: 62

Sharpe: -0.21540284019996037

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

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

Training time (A2C): 0.5886235435803732 minutes

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

A2C Sharpe Ratio: -0.33854513016901516

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

Training time (PPO): 1.9994802514712016 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.44173871278762816 minutes

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

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

previous\_total\_asset:1604856.340468157

end\_total\_asset:1729669.1639079931

total\_reward:124812.82343983604

total\_cost: 705.6817899736025

total trades: 62

Sharpe: 0.3259712017267272

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

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

Training time (A2C): 0.5853295048077901 minutes

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

A2C Sharpe Ratio: 0.2344148134694091

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

Training time (PPO): 2.010724397500356 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.43855851888656616 minutes

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

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

previous\_total\_asset:1729669.1639079931

end\_total\_asset:1113608.3159968513

total\_reward:-616060.8479111418

total\_cost: 631.3407876999667

total trades: 62

Sharpe: -0.23015166421561

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

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

Training time (A2C): 0.5873994867006938 minutes

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

A2C Sharpe Ratio: -0.2977509869049984

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

Training time (PPO): 2.0121955633163453 minutes

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

PPO Sharpe Ratio: -0.28966752153125175

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

Training time (DDPG): 0.4366513729095459 minutes

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

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

previous\_total\_asset:1113608.3159968513

end\_total\_asset:1414671.5480900027

total\_reward:301063.2320931514

total\_cost: 576.0755537384797

total trades: 62

Sharpe: 0.244581026313214

Ensemble Strategy took: 68.75776688655218 minutes

Process finished with exit code 0