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

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

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

Training time (A2C): 0.812846577167511 minutes

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

A2C Sharpe Ratio: -0.11668427590453635

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

Training time (PPO): 2.5105376799901324 minutes

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

PPO Sharpe Ratio: -0.06411276985394981

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

Training time (DDPG): 0.5017940600713094 minutes

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

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

previous\_total\_asset:1000000

end\_total\_asset:1000644.6522262669

total\_reward:644.6522262669168

total\_cost: 78.50905539507866

total trades: 21

Sharpe: 0.17061466652332438

previous\_total\_asset:1000000

end\_total\_asset:1000759.9770695711

total\_reward:759.9770695711486

total\_cost: 77.32291924719812

total trades: 21

Sharpe: 0.20297525469732636

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

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

Training time (A2C): 0.7915273507436117 minutes

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

A2C Sharpe Ratio: 0.4607332697417216

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

Training time (PPO): 2.457768181959788 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.5203236222267151 minutes

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

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

previous\_total\_asset:1000946.7409533672

end\_total\_asset:1004675.6297757466

total\_reward:3728.8888223794056

total\_cost: 100.88395872558594

total trades: 22

Sharpe: 0.1729775111274016

previous\_total\_asset:1000946.7409533672

end\_total\_asset:1004675.6297757466

total\_reward:3728.8888223794056

total\_cost: 100.88395872558594

total trades: 22

Sharpe: 0.1729775111274016

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

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

Training time (A2C): 0.755305802822113 minutes

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

A2C Sharpe Ratio: -0.2123787613810082

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

Training time (PPO): 2.902583344777425 minutes

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

PPO Sharpe Ratio: -0.2303921442261206

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

Training time (DDPG): 0.4905822436014811 minutes

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

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

previous\_total\_asset:1006834.123232626

end\_total\_asset:1006723.0895396987

total\_reward:-111.0336929273326

total\_cost: 135.17244485420224

total trades: 22

Sharpe: -0.005534479327587228

previous\_total\_asset:1006834.123232626

end\_total\_asset:1006272.3752106982

total\_reward:-561.7480219277786

total\_cost: 133.44667911664962

total trades: 22

Sharpe: -0.03065487785637602

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

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

Training time (A2C): 0.8334580183029174 minutes

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

A2C Sharpe Ratio: -0.2724209768268389

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

Training time (PPO): 2.5971152742703754 minutes

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

PPO Sharpe Ratio: -0.14785063803412965

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

Training time (DDPG): 0.5111524383227031 minutes

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

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

previous\_total\_asset:1007762.0006238539

end\_total\_asset:1033366.4484958316

total\_reward:25604.447871977696

total\_cost: 8.814777940082548

total trades: 22

Sharpe: 0.508426836530375

previous\_total\_asset:1007762.0006238539

end\_total\_asset:1033366.4484958316

total\_reward:25604.447871977696

total\_cost: 8.814777940082548

total trades: 22

Sharpe: 0.508426836530375

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

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

Training time (A2C): 0.7265670895576477 minutes

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

A2C Sharpe Ratio: -0.009742616964194576

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

Training time (PPO): 2.666889770825704 minutes

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

PPO Sharpe Ratio: 0.04153955918514329

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

Training time (DDPG): 0.7427684386571248 minutes

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

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

previous\_total\_asset:1036603.907732466

end\_total\_asset:1044211.0322799259

total\_reward:7607.124547459884

total\_cost: 173.683

total trades: 22

Sharpe: 0.2049037503647379

previous\_total\_asset:1036603.907732466

end\_total\_asset:1044248.3692178681

total\_reward:7644.4614854020765

total\_cost: 170.07327908363342

total trades: 22

Sharpe: 0.20667642947702256

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

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

Training time (A2C): 0.8678820172945658 minutes

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

A2C Sharpe Ratio: -0.14673685192961886

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

Training time (PPO): 3.0454489469528196 minutes

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

PPO Sharpe Ratio: -0.09587810508697338

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

Training time (DDPG): 0.7650768478711446 minutes

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

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

previous\_total\_asset:1042563.8130744544

end\_total\_asset:1079955.1714253346

total\_reward:37391.35835088021

total\_cost: 163.0064104053688

total trades: 22

Sharpe: 1.5158059572900768

previous\_total\_asset:1042563.8130744544

end\_total\_asset:1078884.4108095088

total\_reward:36320.597735054325

total\_cost: 142.57383514190673

total trades: 22

Sharpe: 1.5264435146801907

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

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

Training time (A2C): 0.8646931131680806 minutes

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

A2C Sharpe Ratio: 1.2606537324916738

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

Training time (PPO): 3.2249576369921367 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.8238491296768189 minutes

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

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

previous\_total\_asset:1061938.2927053762

end\_total\_asset:1114554.4635342334

total\_reward:52616.170828857226

total\_cost: 191.83000000000004

total trades: 22

Sharpe: 0.8208102027990228

previous\_total\_asset:1061938.2927053762

end\_total\_asset:1114554.4635342334

total\_reward:52616.170828857226

total\_cost: 191.83000000000004

total trades: 22

Sharpe: 0.8208102027990228

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

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

Training time (A2C): 1.0485496719678242 minutes

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

A2C Sharpe Ratio: 0.6237924622795792

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

Training time (PPO): 2.825277392069499 minutes

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

PPO Sharpe Ratio: 0.9684408563857003

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

Training time (DDPG): 0.5965889533360799 minutes

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

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

previous\_total\_asset:1098699.8978979648

end\_total\_asset:1174854.3879013923

total\_reward:76154.49000342749

total\_cost: 216.7911188946533

total trades: 22

Sharpe: 0.4580144589152884

previous\_total\_asset:1098699.8978979648

end\_total\_asset:1174854.3879013923

total\_reward:76154.49000342749

total\_cost: 216.7911188946533

total trades: 22

Sharpe: 0.4580144589152884

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

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

Training time (A2C): 0.9396878798802694 minutes

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

A2C Sharpe Ratio: -0.22826926175456952

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

Training time (PPO): 2.397093407313029 minutes

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

PPO Sharpe Ratio: 0.05052500520166978

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

Training time (DDPG): 0.4400535225868225 minutes

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

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

previous\_total\_asset:1171079.329629459

end\_total\_asset:1125458.9964927249

total\_reward:-45620.33313673409

total\_cost: 207.684

total trades: 22

Sharpe: -0.2523359583155918

previous\_total\_asset:1171079.329629459

end\_total\_asset:1125458.9964927249

total\_reward:-45620.33313673409

total\_cost: 207.684

total trades: 22

Sharpe: -0.2523359583155918

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

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

Training time (A2C): 0.6446852962176005 minutes

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

A2C Sharpe Ratio: -0.08138742686503254

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

Training time (PPO): 2.779076592127482 minutes

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

PPO Sharpe Ratio: -0.08558806317155343

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

Training time (DDPG): 0.46682602167129517 minutes

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

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

previous\_total\_asset:1114639.8372709232

end\_total\_asset:1167184.1319687231

total\_reward:52544.29469779995

total\_cost: 189.63170471157073

total trades: 22

Sharpe: 0.27281547325700095

previous\_total\_asset:1114639.8372709232

end\_total\_asset:1167981.6258299814

total\_reward:53341.788559058215

total\_cost: 197.48187102030758

total trades: 22

Sharpe: 0.27684514741227656

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

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

Training time (A2C): 0.6788906693458557 minutes

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

A2C Sharpe Ratio: -0.11804509902352173

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

Training time (PPO): 2.522716498374939 minutes

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

PPO Sharpe Ratio: -0.1766441671295721

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

Training time (DDPG): 0.5277915676434835 minutes

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

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

previous\_total\_asset:1175563.5190592501

end\_total\_asset:1291568.224037063

total\_reward:116004.70497781294

total\_cost: 237.89992924194337

total trades: 22

Sharpe: 0.5068720710029466

previous\_total\_asset:1175563.5190592501

end\_total\_asset:1291568.224037063

total\_reward:116004.70497781294

total\_cost: 237.89992924194337

total trades: 22

Sharpe: 0.5068720710029466

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

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

Training time (A2C): 0.7356700857480367 minutes

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

A2C Sharpe Ratio: -0.18533114878334553

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

Training time (PPO): 2.689950720469157 minutes

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

PPO Sharpe Ratio: 0.020238856056709633

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

Training time (DDPG): 0.5567125042279562 minutes

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

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

previous\_total\_asset:1306635.8133764376

end\_total\_asset:1121668.3064735131

total\_reward:-184967.5069029245

total\_cost: 190.54896000000005

total trades: 22

Sharpe: -0.6176195725834613

previous\_total\_asset:1306635.8133764376

end\_total\_asset:1121668.3064735131

total\_reward:-184967.5069029245

total\_cost: 190.54896000000005

total trades: 22

Sharpe: -0.6176195725834613

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

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

Training time (A2C): 0.8537014921506246 minutes

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

A2C Sharpe Ratio: -0.7033118223515036

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

Training time (PPO): 2.561575472354889 minutes

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

PPO Sharpe Ratio: -0.5818045524144753

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

Training time (DDPG): 0.4975285450617472 minutes

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

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

previous\_total\_asset:1075180.2261694635

end\_total\_asset:1319834.6919727463

total\_reward:244654.4658032828

total\_cost: 13.82746

total trades: 22

Sharpe: 0.4394110678874971

previous\_total\_asset:1075180.2261694635

end\_total\_asset:1319834.6919727463

total\_reward:244654.4658032828

total\_cost: 13.82746

total trades: 22

Sharpe: 0.4394110678874971

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

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

Training time (A2C): 0.8370032628377279 minutes

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

A2C Sharpe Ratio: -0.057012976078196366

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

Training time (PPO): 2.730319599310557 minutes

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

PPO Sharpe Ratio: -0.053875898345794176

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

Training time (DDPG): 0.6515378634134928 minutes

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

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

previous\_total\_asset:1306171.8719572204

end\_total\_asset:1496879.4454225947

total\_reward:190707.5734653743

total\_cost: 270.0613996998597

total trades: 22

Sharpe: 0.6857300637341858

previous\_total\_asset:1306171.8719572204

end\_total\_asset:1496879.4454225947

total\_reward:190707.5734653743

total\_cost: 270.0613996998597

total trades: 22

Sharpe: 0.6857300637341858

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

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

Training time (A2C): 0.7539147178332011 minutes

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

A2C Sharpe Ratio: 0.38914366812580375

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

Training time (PPO): 2.6167625069618223 minutes

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

PPO Sharpe Ratio: nan

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

Training time (DDPG): 0.4369532108306885 minutes

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

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

previous\_total\_asset:1478700.001056466

end\_total\_asset:1354390.5465820932

total\_reward:-124309.45447437279

total\_cost: 207.29368000000002

total trades: 22

Sharpe: -0.5932190792391135

previous\_total\_asset:1478700.001056466

end\_total\_asset:1354390.5465820932

total\_reward:-124309.45447437279

total\_cost: 207.29368000000002

total trades: 22

Sharpe: -0.5932190792391135

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

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

Training time (A2C): 0.6407927632331848 minutes

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

A2C Sharpe Ratio: -0.5759862999778803

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

Training time (PPO): 2.1429521958033244 minutes

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

PPO Sharpe Ratio: -0.5759862999778803

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

Training time (DDPG): 0.4368014415105184 minutes

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

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

previous\_total\_asset:1433442.6752783095

end\_total\_asset:1494528.7201792928

total\_reward:61086.04490098334

total\_cost: 269.7796871819305

total trades: 22

Sharpe: 0.4093149663481607

previous\_total\_asset:1433442.6752783095

end\_total\_asset:1494528.7201792928

total\_reward:61086.04490098334

total\_cost: 269.7796871819305

total trades: 22

Sharpe: 0.4093149663481607

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

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

Training time (A2C): 0.6337315599123637 minutes

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

A2C Sharpe Ratio: 0.2821770752812605

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

Training time (PPO): 2.2981724381446837 minutes

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

PPO Sharpe Ratio: 0.34116062722989765

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

Training time (DDPG): 0.5840800205866495 minutes

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

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

previous\_total\_asset:1495807.1647939077

end\_total\_asset:937534.9999963867

total\_reward:-558272.164797521

total\_cost: 167.48939400226595

total trades: 22

Sharpe: -0.42256523763143805

previous\_total\_asset:1495807.1647939077

end\_total\_asset:946633.0529706548

total\_reward:-549174.1118232529

total\_cost: 138.09408805060147

total trades: 22

Sharpe: -0.4199271667324764

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

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

Training time (A2C): 0.7727133711179097 minutes

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

A2C Sharpe Ratio: -0.3573615213525032

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

Training time (PPO): 2.120814895629883 minutes

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

PPO Sharpe Ratio: -0.43439026752775206

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

Training time (DDPG): 0.44065869251887 minutes

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

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

previous\_total\_asset:1175858.191472285

end\_total\_asset:1212984.6037656248

total\_reward:37126.41229333985

total\_cost: 199.4017272172928

total trades: 22

Sharpe: 0.10889674934417465

previous\_total\_asset:1175858.191472285

end\_total\_asset:1210340.8128514972

total\_reward:34482.62137921224

total\_cost: 176.19891953567506

total trades: 22

Sharpe: 0.10364923656460012

Ensemble Strategy took: 71.61932863394419 minutes

Process finished with exit code 0