

<https://outlook.office.com/mail/search/id/AAQkADkzMjIwNDZhLTk3YTktNGI2Zi1hMzVhLTAyYmJkMjJhMDliNwAQAMblnbH1e7NKtMoKNfVwyxk%3D> 1/11

1.2. Class documentation. Provide concise documentation for each class in your application. Explain each class as through providing documentation for a developer who will be maintaining your application in the future.

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You have provided documentation for the classes in your application.

Your documentation is detailed and comprehensive.

Your documentation does not emphasize the structure of your application by presenting all of the information

for a class together; the information on the fields is presented first and then the documentation on the methods. It would be

better to present this class-by-class. For example, by following the JavaDoc style of documentation.

The level of documentation provided is consistent, with all methods having some documentation.

The only exception to this is the getter and setter methods which are self-explanatory and

do not have accompanying documentation; this is fine.

You documented both public and private methods of your classes; this is the right kind of documentation to provide to someone who is maintaining your application.

Method type information is included in your documentation (method input types and method result types are specified).

However, you do not give information about the visibility of methods (e.g. public/private/protected).

Your naming of methods is descriptive and consistent.

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1.3. Stateful drone strategy. This section explains the strategy which is used by your stateful drone to improve their score relative to the stateless drone. You should explain what is remembered in the state of the stateful drone and how this is used to improve the drone's score. This section of your report should contain two graphical figures (similar to Figure 6 and Figure 7 in this document) which have been made using the <http://geojson.io> website, rendering one flight of your stateless drone and one flight of your stateful drone on a PowerGrab map of your choosing. It can be any of the available PowerGrab maps, but make sure that the same map is used for both the stateless drone and the stateful drone.

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You provided a detailed description of the strategy of the stateful drone.

Your description is comprehensive and easy-to-follow.

However, some aspects of your strategy seem arbitrary, such as choosing the five closest stations.

As required, you explained what is remembered in the state of the stateful drone.

You described how randomness plays a role in the stateful drone strategy.

Danger avoidance is described here; you explain how the drone avoids negative charging stations.

As required, you included plots of the flight path for the stateless and stateful drones.

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## 2. Implementation (24/30)

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The instructions were as follows:

Your submission should faithfully implement the stateless and the stateful drones of the PowerGrab game, hosted in a framework which

allows the drone to make 250 moves against a map for a particular day. Your application should be useably efficient, without significant stalls while executing. Your code should be readable and clear, making use of private values, variables and functions, and encapsulating code and data structures. Where it is appropriate to do so, your classes should be structured in a way which makes use of the Java class hierarchy mechanism. All else being equal, code with comments should receive a higher mark than code without comments. Everyone thinks that their code is self-documenting, but it isn't.

Comments on compiling your code using Maven (may be empty if no issues):

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Your Maven project compiled without problems.

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Comments on the performance of your implementation:

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Your project ran efficiently, generating a drone trail in seconds or less.

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Comments from a review of your submitted code:

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You were asked to encapsulate information and make fields or methods private if possible; you have done this to an extent.

You have many private fields, but few private methods. You have many methods which

are public but do not need to be.

You also have some fields and methods which are protected.

You have declared final values for constants in your application; this is good practice.

You have declared class hierarchies in your application; this is good practice.

Your application catches exceptions and deals with them well.

However, the diagnostic messages which you generate for the user could be more complete and more informative.

Your application makes good use of foreach loops and collection classes.

Your application makes good use of generics also.

You used the Mapbox library to generate your Geo-JSON code; this was a good idea and the easiest way to generate the Geo-JSON files.

You did not use the raw JSON objects (JsonObject/JsonElement) from the Google GSON library in your application. This was a good decision because you do not need to use them.

You did not use the random-number seed in initialising your random number generator. This is not good practice because it will be difficult to reproduce the results of your program in the future.

You provided good comments in your code to help other readers to understand it.

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### 3. Output (8/15)

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The instructions specified:

The output files which you submit will be tested to ensure that the moves made by the drone are legal according to the rules of the PowerGrab game, and the class of drone which is being used. The quality of the drone strategy implemented will be graded depending on the score which the drone achieves: the higher the score, the better the quality of the drone.

Comments on your .geojson output files (may be empty):

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Comments on your .txt output files (may be empty):

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Your output files do not seem to collect coins from the nearest charging station. That is an illegal move in the PowerGrab game.

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Assessment of your output was assisted by the use of a program that analysed the output files generated by your submitted code. The output files considered include both those which you submitted and further files generated during testing. Here is the analysis report.

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Begin report for student s1703084.

#### Processing stateless Geo-JSON

Processing stateless-01-01-2019.geojson ... read ... parsed ... has drone trail ... coverage 63.75% ... success.

Processing stateless-02-02-2019.geojson ... read ... parsed ... has drone trail ... coverage 51.38% ... success.

Processing stateless-03-03-2019.geojson ... read ... parsed ... has drone trail ... coverage 69.00% ... success.

Processing stateless-04-04-2019.geojson ... read ... parsed ... has drone trail ... coverage 71.68% ... success.

Processing stateless-05-05-2019.geojson ... read ... parsed ... has drone trail ... coverage 53.38% ... success.

Processing stateless-06-06-2019.geojson ... read ... parsed ... has drone trail ... coverage 75.97% ... success.

Processing stateless-07-07-2019.geojson ... read ... parsed ... has drone trail ... coverage 67.68% ... success.

Processing stateless-08-08-2019.geojson ... read ... parsed ... has drone trail ... coverage 47.96% ... success.

Processing stateless-09-09-2019.geojson ... read ... parsed ... has drone trail ... coverage 43.76% ... success.

Processing stateless-10-10-2019.geojson ... read ... parsed ... has drone trail ... coverage 35.69% ... success.

Processing stateless-11-11-2019.geojson ... read ... parsed ... has drone trail ... coverage 52.00% ... success.

Processing stateless-12-12-2019.geojson ... read ... parsed ... has drone trail ... coverage 53.95% ... success.

#### Processing stateful Geo-JSON

Processing stateful-01-01-2019.geojson ... read ... parsed ... has drone trail ... coverage 93.30% ... success.

Processing stateful-01-01-2020.geojson ... read ... parsed ... has drone trail ... coverage 89.88% ... success.

Processing stateful-02-02-2019.geojson ... read ... parsed ... has drone trail ... coverage 91.42% ... success.

Processing stateful-02-02-2020.geojson ... read ... parsed ... has drone trail ... coverage 85.79% ... success.

Processing stateful-03-03-2019.geojson ... read ... parsed ... has drone trail ... coverage 97.09% ... success.

Processing stateful-03-03-2020.geojson ... read ... parsed ... has drone trail ... coverage 88.57% ... success.

Processing stateful-04-04-2019.geojson ... read ... parsed ... has drone trail ... coverage 87.82% ... success.

Processing stateful-04-04-2020.geojson ... read ... parsed ... has drone trail ... coverage

92.76% ... success.  
Processing stateful-05-05-2019.geojson ... read ... parsed ... has drone trail ... coverage 83.43% ... success.  
Processing stateful-05-05-2020.geojson ... read ... parsed ... has drone trail ... coverage 82.43% ... success.  
Processing stateful-06-06-2019.geojson ... read ... parsed ... has drone trail ... coverage 91.62% ... success.  
Processing stateful-06-06-2020.geojson ... read ... parsed ... has drone trail ... coverage 84.72% ... success.  
Processing stateful-07-07-2019.geojson ... read ... parsed ... has drone trail ... coverage 91.49% ... success.  
Processing stateful-07-07-2020.geojson ... read ... parsed ... has drone trail ... coverage 90.68% ... success.  
Processing stateful-08-08-2019.geojson ... read ... parsed ... has drone trail ... coverage 84.51% ... success.  
Processing stateful-08-08-2020.geojson ... read ... parsed ... has drone trail ... coverage 94.21% ... success.  
Processing stateful-09-09-2019.geojson ... read ... parsed ... has drone trail ... coverage 84.94% ... success.  
Processing stateful-09-09-2020.geojson ... read ... parsed ... has drone trail ... coverage 79.62% ... success.  
Processing stateful-10-10-2019.geojson ... read ... parsed ... has drone trail ... coverage 85.00% ... success.  
Processing stateful-10-10-2020.geojson ... read ... parsed ... has drone trail ... coverage 88.61% ... success.  
Processing stateful-11-11-2019.geojson ... read ... parsed ... has drone trail ... coverage 88.17% ... success.  
Processing stateful-11-11-2020.geojson ... read ... parsed ... has drone trail ... coverage 83.72% ... success.  
Processing stateful-12-12-2019.geojson ... read ... parsed ... has drone trail ... coverage 94.33% ... success.  
Processing stateful-12-12-2020.geojson ... read ... parsed ... has drone trail ... coverage 85.68% ... success.

#### Processing stateless

Processing stateless-01-01-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateless-02-02-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateless-03-03-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateless-04-04-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateless-05-05-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateless-06-06-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateless-07-07-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateless-08-08-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateless-09-09-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateless-10-10-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateless-11-11-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateless-12-12-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.

#### Processing stateful



Processing stateful-01-01-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-01-01-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-02-02-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-02-02-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-03-03-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-03-03-2020.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateful-04-04-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-04-04-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-05-05-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-05-05-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-06-06-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-06-06-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-07-07-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-07-07-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-08-08-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-08-08-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-09-09-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateful-09-09-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-10-10-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateful-10-10-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-11-11-2019.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-11-11-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.  
Processing stateful-12-12-2019.txt ... read ... parsed ... syntax analysed ... semantic analysis complete ... passed.  
Processing stateful-12-12-2020.txt ... read ... parsed ... syntax analysed ... has semantic errors ... failed.

Warnings: 0 files generated warnings.

Errors: 26 files contained errors.

stateless-01-01-2019.txt:

\* line 69, 49.270935 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 149, 80.63049 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateless-03-03-2019.txt:

- \* line 15, 92.824356 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 77, 87.15433 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateless-06-06-2019.txt:

- \* line 11, 62.62078 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateless-07-07-2019.txt:

- \* line 4, 13.649208 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateless-08-08-2019.txt:

- \* line 10, 18.332275 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 21, 39.838318 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateless-11-11-2019.txt:

- \* line 35, 38.12988 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-01-01-2019.txt:

- \* line 21, 89.15875 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 22, 15.655182 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-01-01-2020.txt:

- \* line 64, 121.06586 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 120, 51.654053 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 206, 118.397095 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-02-02-2019.txt:

- \* line 10, 82.35524 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 46, 35.35498 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 60, 6.4086304 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* ...

stateful-02-02-2020.txt:

- \* line 87, 41.804016 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 141, 99.37952 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-03-03-2019.txt:

- \* line 15, 8.899017 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

- \* line 100, 84.84509 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-04-04-2019.txt:

\* line 48, 113.958984 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 70, 63.103333 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 71, 108.12543 coins collected but the nearest charging station has 63.10334 coins. Illegal amount collected.

stateful-04-04-2020.txt:

\* line 5, 0.6272049 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 89, 106.91907 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-05-05-2019.txt:

\* line 30, 24.948608 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-05-05-2020.txt:

\* line 18, 39.691734 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 52, 50.29239 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 72, 88.822266 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* ...

stateful-06-06-2019.txt:

\* line 96, 66.96826 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-06-06-2020.txt:

\* line 88, 2.6247559 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 214, 70.06482 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-07-07-2019.txt:

\* line 68, 88.987305 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-07-07-2020.txt:

\* line 11, 21.448853 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 15, 114.388245 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 47, 96.05469 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* ...

stateful-08-08-2019.txt:

\* line 5, 122.97327 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 8, 39.838303 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 21, 12.668457 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* ...

stateful-08-08-2020.txt:

\* line 8, 11.286713 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.



\* line 23, 81.910995 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 101, 105.78302 coins collected but the nearest charging station has 11.286713 coins. Illegal amount collected.

stateful-09-09-2020.txt:

\* line 12, 62.497665 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 19, 8.843292 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-10-10-2020.txt:

\* line 66, 22.909424 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 96, 46.10437 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 121, 26.276123 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* ...

stateful-11-11-2019.txt:

\* line 23, 25.069733 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-11-11-2020.txt:

\* line 177, 115.048584 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

stateful-12-12-2020.txt:

\* line 92, 0.4260254 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

\* line 119, 74.29834 coins collected but the nearest charging station has 0.0 coins. Illegal amount collected.

Summary:

\* stateless-01-01-2019.txt: coins available=1880.4354, coins collected=999.0212 (some errors reported)

\* stateless-02-02-2019.txt: coins available=2136.1936, coins collected=1009.9482 (no errors reported)

\* stateless-03-03-2019.txt: coins available=2177.0789, coins collected=1148.5571 (some errors reported)

\* stateless-04-04-2019.txt: coins available=2274.8113, coins collected=785.9016 (no errors reported)

\* stateless-05-05-2019.txt: coins available=1877.1597, coins collected=1063.2207 (no errors reported)

\* stateless-06-06-2019.txt: coins available=2137.4634, coins collected=1100.2832 (some errors reported)

\* stateless-07-07-2019.txt: coins available=1903.8746, coins collected=603.9368 (some errors reported)

\* stateless-08-08-2019.txt: coins available=1815.7861, coins collected=858.8883 (some errors reported)

\* stateless-09-09-2019.txt: coins available=1800.3646, coins collected=781.2479 (no errors reported)

\* stateless-10-10-2019.txt: coins available=2301.3782, coins collected=772.896 (no errors reported)

\* stateless-11-11-2019.txt: coins available=1974.8003, coins collected=665.8813 (some errors reported)

\* stateless-12-12-2019.txt: coins available=2492.0884, coins collected=1367.3861 (no errors reported)

stateless drone total: 5780.6006/24771.436 = 23.34%

\* stateful-01-01-2019.txt: coins available=1880.4354, coins collected=1875.9886 (some errors reported)  
\* stateful-01-01-2020.txt: coins available=2141.0962, coins collected=2141.0967 (some errors reported)  
\* stateful-02-02-2019.txt: coins available=2136.1936, coins collected=2069.0862 (some errors reported)  
\* stateful-02-02-2020.txt: coins available=1911.6075, coins collected=1503.8596 (some errors reported)  
\* stateful-03-03-2019.txt: coins available=2177.0789, coins collected=1863.1372 (some errors reported)  
\* stateful-03-03-2020.txt: coins available=1960.443, coins collected=1830.5574 (no errors reported)  
\* stateful-04-04-2019.txt: coins available=2274.8113, coins collected=2099.5334 (some errors reported)  
\* stateful-04-04-2020.txt: coins available=2533.1794, coins collected=2467.5398 (some errors reported)  
\* stateful-05-05-2019.txt: coins available=1877.1597, coins collected=1877.1598 (some errors reported)  
\* stateful-05-05-2020.txt: coins available=2210.3735, coins collected=2143.8867 (some errors reported)  
\* stateful-06-06-2019.txt: coins available=2137.4634, coins collected=2077.9797 (some errors reported)  
\* stateful-06-06-2020.txt: coins available=1873.7109, coins collected=1590.379 (some errors reported)  
\* stateful-07-07-2019.txt: coins available=1903.8746, coins collected=1622.1124 (some errors reported)  
\* stateful-07-07-2020.txt: coins available=2647.6233, coins collected=2516.8179 (some errors reported)  
\* stateful-08-08-2019.txt: coins available=1815.7861, coins collected=1742.5172 (some errors reported)  
\* stateful-08-08-2020.txt: coins available=2170.0454, coins collected=1970.1813 (some errors reported)  
\* stateful-09-09-2019.txt: coins available=1800.3646, coins collected=1707.656 (no errors reported)  
\* stateful-09-09-2020.txt: coins available=2292.5923, coins collected=2187.0464 (some errors reported)  
\* stateful-10-10-2019.txt: coins available=2301.3782, coins collected=2176.7087 (no errors reported)  
\* stateful-10-10-2020.txt: coins available=2143.1592, coins collected=2143.1592 (some errors reported)  
\* stateful-11-11-2019.txt: coins available=1974.8003, coins collected=1640.1913 (some errors reported)  
\* stateful-11-11-2020.txt: coins available=2022.1965, coins collected=1769.9735 (some errors reported)  
\* stateful-12-12-2019.txt: coins available=2492.0884, coins collected=2407.8967 (no errors reported)  
\* stateful-12-12-2020.txt: coins available=2098.6946, coins collected=2006.3168 (some errors reported)  
stateful drone total: 8122.8184/50776.16 = 16.00%

End report for student s1703084.

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END OF REPORT

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