

ProcessSector.pl

Purpose:

This is a perl script that is intended to be run offline of Astrosynthesis 2.0 (AS2.0). It is not a plug-in. It will take a CSV data set exported from an Astrosynthesis 2.0 Sector, parse it for useful information and generate travel routes between all of the systems in the sector.

Travel routes are generally limited to 8 light years in length. This limit may be changed within the program. However, since all of the systems need to be connected to all of the other systems a minimum number of longer routes are added such that a complete graph is created. Once all of the travel routes have been determined, it will determine the amount of expected traffic on each of these routes. This traffic is determined by identifying some systems as economically important, designated a major system, usually due to large population. In this determination, the presence of a white dwarf star results in the lowest possible value and population on space stations is ignored. Other relevant factors are the presence of gas giants (for refueling) and mineral rich planets (as decided by a high density) and asteroid belts. The script will determine the shortest path of routes that will link each of the major systems to each other. The more times a particular route is used in the path between two major systems the higher traffic value it will have. Shortest path is determined by both travel distance and the economic value of the destination system. Thus, when given a choice between a white dwarf system and a system loaded with mineral rich planets and a gas giant ripe for a refueling scoop, the script will avoid the white dwarf.

If the user has a particular system that they want to be a major system there will be an opportunity before traffic values are determined to stop the script, edit the data file and start the script up again.

The output is more fully described below, but there is a CSV file that can be imported into AS2.0. The user will either have to use Save As... to save the sector or run the Modify All Routes plug-in script from within AS2.0 and then save the sector. There will also be an IP Pro table file that can be used to randomly generate a system location within the sector.

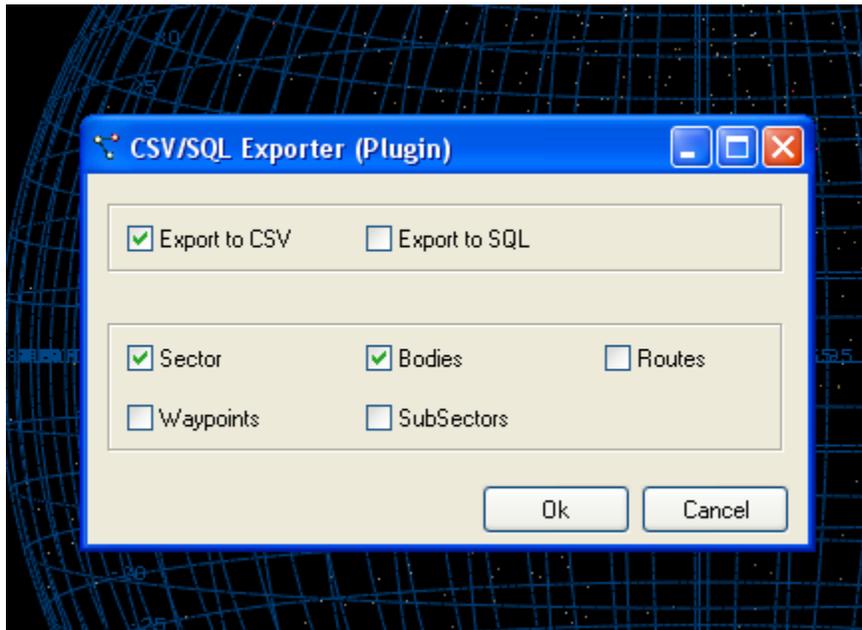
Requirements:

- Installed perl. I used ActiveState perl for Windows 32 (<http://www.activestate.com/activeperl/downloads>).
- Graph.pm package installed. This can be installed using perl\bin\ppm.
- SQL/CSV exporter Astrosynthesis plug-in script. This can be found on NOX (<http://www.nbos.com/nox/>).
- Read/Write access to the directory in which the script is run.

Use:

1. Place the script ProcessSector.pl in a working directory.

2. Start AS2.0, load your sector. Run the SQL/CSV Exporter plug-in.



3. The plug-in will place the output in the folder:
Program Files\nbos\AstroSynthesis2\CSV\\
4. Copy the file <Sector Name>_Bodies.csv to the directory where you are running the script.
5. Run the perl script:
perl\bin\perl.exe ProcessSector.pl
6. You will be asked to enter the name of the sector to process.

```
What is the name of the sector to process?  
Sample
```

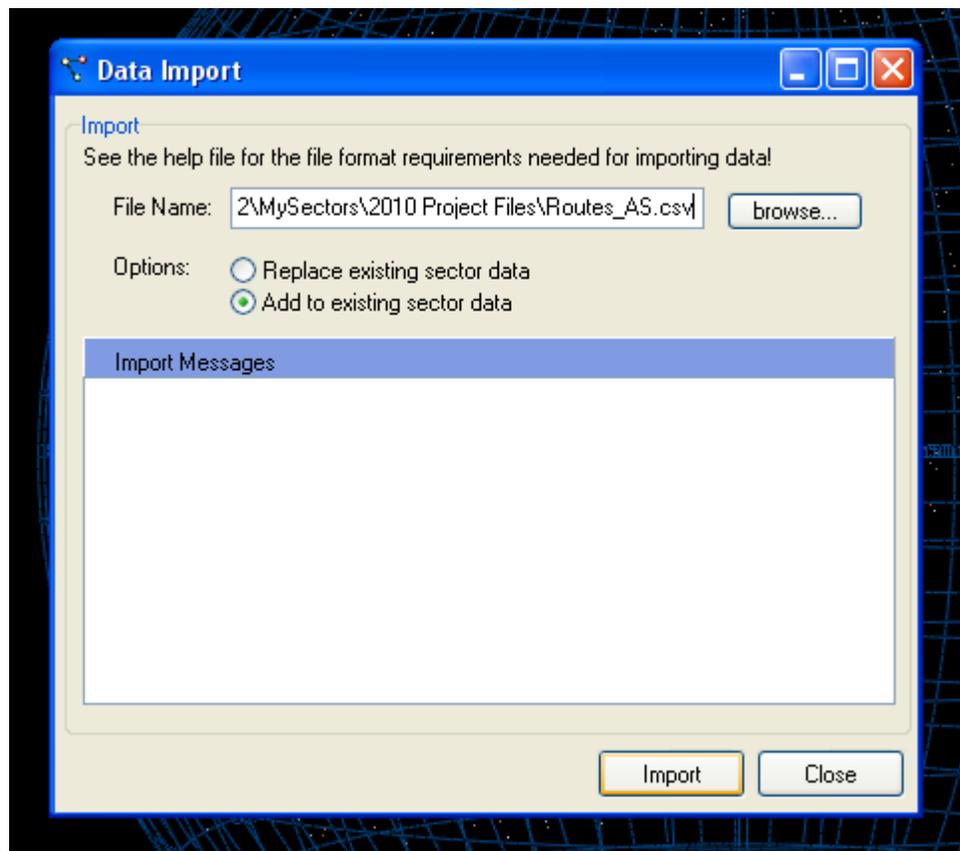
7. The script will process the data and pause before it is about to determine the main trade routes, called MSR (for Main Supply Routes).

```
Stage 5: Finding trade routes...  
Note, this process can take a very long time. This sector has 2 Major  
Systems. My computer can handle about 100 routes in an hour, this sector will  
have about 3 routes. Actual computation time will depend highly on the  
complexity of the sector, larger sectors will take longer to generate each route.  
  
The following are major systems in this sector:  
S-1011-04  
Aphia Nira  
  
If you would like to change the list of major systems, stop the program now and  
edit field 6 of CollatedSystemsData.csv. A '1' will indicate a major system. Do  
not use a spreadsheet program to edit the file, it will add quotation marks that  
will prevent this program from loading the data set.  
  
Would you like to continue? <y/n/yes/no> no
```

8. At this point, you may halt the program and all progress will be saved. You may change the list of major systems by editing the <sector

name>_CollatedSystemData.csv file. Changing field 7 (when counting from 1) to 1 will make it a Major system, 0 makes it a minor system. Do not edit the file in a spreadsheet program that will add quotation marks to the text fields as this may prevent the script from loading the data file. The top line will be the index value at which to start the generation of trade routes. Continuing the script from this point simply involves starting the script as detailed in steps 5-7. Be sure to enter yes when prompted in step 7.

9. Now the script will use a shortest path algorithm to determine trade routes between the major systems. Because this can take a long time, depending on the sector, the script saves its progress. This allows the user to hit control-c to terminate the script after it completes each system. The script will indicate when it is safe to hit control-c. You do not have to be exact on your timing. The script will restart from the the last system fully completed, as indicated by the script. Restarting the script from this point is detailed in steps 5-7. NOTE: DO NOT EDIT THE LIST OF MAJOR SYSTEMS ONCE YOU START GENERATING THE TRADE ROUTES. This will change the list, and the order of systems in the list and you will get unpredictable results. If you forgot a system and need to start over, delete the <sector name>_CollatedSystemData.csv file and the script will start from stage 1.
10. Once the script completes, start AS 2.0 and load your sector.
11. Select File > Import > Import CSV Data. The window below will be displayed.



12. Find your working directory and your <sector name>_Routes_AS.csv file. Select Add

to existing sector data and click Import.

13. The route information will be imported. However, AS 2.0 will not save this data unless you either select File > Save As... or run the Modify All Routes plug-in.

14. Done.

Output:

<Sector Name>_CollatedSystemData.csv

Contains a summary of sector data. It can be useful to load into a spreadsheet and sort for various types of information. The format is:

0 = ID

1 = System Name

2 = X coordinate

3 = Y coordinate

4 = Z coordinate

5 = Weight

6 = Major? 1=Major System

7 = Habitability 1=Habitable 2=Hospitable

8 = WD Present? 1=White Dwarf in system

9 = Econ value, sum of all traffic from all edges that connect

10 = Total system population.

<Sector Name>_Routes.csv

Contains all of the route data. The format is:

0 = route ID

1 = Start ID. A system ID

2 = End ID. A system ID

3 = Distance

4 = Traffic

<Sector Name>_Routes_AS.csv

Contains all of the route data in AS 2.0 suitable format. Intended for loading into AS 2.0. The format is:

0 = Body Type.

1 = Start Body.

- 2 = End Body.
- 3 = Route Type.
- 4 = Route Name.
- 5 = Route Color.
- 6 = Route Style.

<Sector Name>_SystemNames.ipt

Contains all of the system names divided into Major, Minor and Offroute systems for use in Inspiration Pad Pro. The total economic value of each system is used as a weight on the table. Major systems are the systems indicated as Major by reason of population or user intervention. Minor systems are systems along the trade routes that connect the Major systems. Offroute systems are all other systems. SystemName will generate a random name from all systems, weighted toward Major and Minor systems. The table names are:

- <sector name>_SystemName
- <sector name>_MajorSystems
- <sector name>_MinorSystems
- <sector name>_OffrouteSystems

Versions:

1.0 April 18, 2011: Initial Release.

1.1 May 17, 2011: Corrected field number of Major System in Step 8. Updated script to save traffic data in field 10 as originally intended, and to generate the IPT tables correctly.

Credits:

Script mostly written by Dan Williamson with help from Jan Ruzicka for the shortest path routine. Dan and Jan can be reached at dwillmsn-home@yahoo.com

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