# QWait

**Theme Park Visitor Simulator**

https://github.com/MaximumOctopus/QWait

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**Introduction**

This was developed after watching a YouTube video which discussed the differences in queue time between FastPass+ and non-FastPass enabled theme parks, when modelled.

I thought it would be an interesting project to build my own simulation and see what came out.

I've relied heavily on internet sources for much of the data regarding theme park operation (such as ride length). Without this information a simulation like this would be much harder to build. Where I couldn't find information I made an educated guess. I've listed the sources at the bottom of this document and in the source code where they are used.

The information for the five real parks supplied has been collated from a number of sources, and will be accurate enough considering the complexity of the simulation. I'm always looking for more accurate data, so if you know of a source please let me know.

This isn't a perfect simulation, but I think for a first release it's "good enough".

Unlike the simulation in the video mentioned above, my version does have visitors which travel from ride to ride. It's a small addition but I think it's important.

Visitors won't get hungry, thirsty, or tired. This is on the to-do list for a future version.

It's written in C++ with Visual Studio 2022 but should compile with any C++ compiler on (I think) any platform. If you notice something platform-dependent, then please let me know.

**Installation**

It doesn't need installing, just run it from wherever you copy it to.

**Command Line Parameters**

`/Visitors;x`

Set the number of park visitors to *x*. The exact number of visitors created could be very slightly higher. Groups are generated at random (with a varying number of members) until the visitor count is equalled or exceeded.

`/Template;x`

Select a Theme Park template to use, where x represents:

| | |
|---|---|
| 0 | Test park |
| 1 | Animal Kingdom (based on real-world data) |
| 2 | EPCOT (based on real-world data) |
| 3 | Hollywood Studios (based on real-world data) |
| 4 | Magic Kingdom (based on real-world data) |
| 5 | Coin-op arcade |
| 6 | Alton Towers UK (based on real-world data) |

`/UseConfigFile;filename (default is QWaitConfig.ini)`

Set application configuration from a configuration file. An example file exists in the root of the installation folder.

`/ImportVisitorDemo;filename`

Import visitor demographics from a previously saved file. If need to use the exact visitor demographics for multiple runs, then this is the best option to use. Visitor data would normally be randomly created for each separate application run.

`/ReportHTML;filename`

Export an HTML report of the current simulation.

If file name is left blank, then `yyyymmdd_hhmmss.html` will be used instead.

`/ReportCVD;filename`

Export complete visitor data for the current simulation.

If file name is left blank, then `yyyymmdd_hhmmss_visitors.csv` will be used instead.

`/ReportCSVMXM`

Export a minute-by-minute report for the current simulation. This contains a list of important data for each minute of the simulation run time.

Saves to `yyyymmdd_hhmmss_mxm.csv`.

`/ReportTextMXM`

Exports a minute-by-minute report to a text file.

Saves to `yyyymmdd_hhmmss_mxm.txt`.

`/ReportVisitorRideList`

Export a CSV file containing each visitor and the rides ridden during the simulation.

Row structure is:

```
Group ID, Visitor ID, Ride Count, Ride List,…
```

`/ReportSimulation`

A synopsis of the current simulation.

Saves to `yyyymmdd_hhmmss_sim.txt`.

`/ReportVisitorLocation`

Warning: This report will be around 280MB for every 20000 park visitors!

This contains a minute-by-minute report of the location of every single visitor.

Saves to `yyyymmdd_hhmmss_location.csv`.

`/ReportVisitorDemo;filename`

Exports the current visitor details to a file. Use this with `/ImportVisitorDemo` above.

`/DebugDistanceCache`

Exports the ride-to-ride distance and time caches to a CSV file.

`/DebugNoExecute`

Processes everything but does not run the simulation.

`/DebugSCC`

Export the selection choice cache data. This is used by the simulation when visitors are selecting rides.

Saves to `yyyymmdd_hhmmss_sscc.csv`.

`/DebugUpdateRate;`*`x`*

Changes the console debug information update rate to every *x* minutes. The default is every 15 minutes.

**Example usage**

```
qwait /?
```

Shows version information and list of all available reports and parameters.

```
qwait /visitors;30000 /template;1 /reporthtml
```

Run a simulation with 30000 visitors, on the Animal Kingdom data, and save an HTML report to `yyyymmdd_hhmmss.html`.

```
qwait /visitors;10000 /template;2 /reporthtml;report2
```

Run a simulation with 10000 visitors, on the Epcot data, and save an HTML report to `report2.html`.

```
qwait /cat
```

```
:)
```

# Sources

https://wdwthemeparks.com/hourly-capacity-numbers/

https://www.wdwinfo.com/wdwinfo/ridelength.htm

https://crooksinwdw.wordpress.com/2013/12/14/theoreticaloperational-hourly-ride-capacity-at-wdw/

https://eu.azcentral.com/story/travel/destinations/california/2019/08/16/disneyland-ride-capacity-how-long-will-you-have-wait-line/1927184001/

https://magicguides.com/disney-world-statistics/

https://www.mousehacking.com/blog/best-animal-kingdom-rides

https://www.mousehacking.com/blog/every-walt-disney-world-ride-ranked

https://magicguides.com/best-epcot-attractions/

https://www.mousehacking.com/blog/disney-world-height-requirements

https://www.disneytouristblog.com/paid-lightning-lanes-genie-replace-free-fastpass-disney-world/

https://www.wdwinfo.com/wdwinfo/fastpass.htm

https://forums.wdwmagic.com/threads/percentage-of-fps-allocated-for-rides-wdw.955357/

https://towersstreet.com/theme-park/ride/

https://www.themeparkjames.co.uk/theme-parks/europe/uk/alton-towers/

https://www.youtube.com/watch?v=cVUlHjQximM

# Credits

| | |
|---|---|
| **Programming** | Paul Alan Freshney |
| **Development Cats** | Rutherford, Freeman, and Maxwell<br>(maximumoctopus.com/developmentcats.htm) |
| **Icon** | icon-icons.com |

Dedicated to Julie, Dyanne, and Adam.

All of my software is free and open source.

Please donate to your local cat charity or shelter, thanks.

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