

## INSTRUCTIONS TO USE LHT\_CI.py

The file LHT\_CI.py is a Python3 program that performs the calculations.

1. Data should be in a .csv file with only three columns, for instance:

| <b>t</b> | <b>n</b> | <b>h</b> |
|----------|----------|----------|
| 1        | 50       | 0        |
| 2        | 50       | 0        |
| 3        | 50       | 0        |
| 4        | 49       | 0        |
| 5        | 49       | 0        |
| 6        | 49       | 0        |
| 7        | 49       | 0        |
| 8        | 48       | 0        |
| 9        | 46       | 0        |
| 10       | 44       | 28       |
| 11       | 44       | 28       |
| 12       | 44       | 10       |
| 13       | 43       | 118      |
| 14       | 41       | 111      |

The **first column** are the units of time. The **second column** contains number of individuals alive at that unit of time. The **third column** contains offspring production in that unit of time.

2. Inside the code, modify the alpha required and change the file name:

```
alpha = 0.05           # 1-alpha is the confidence level of CI,  
fnam = "Data.csv"      # Change file name.
```

3. Change directory path here, live commented if file is in current directory:

```
# dir_path = "/Users/datasets/"
```

4. Run the program, an example output is:

|   |  |
|---|--|
| Initial number of individuals N : 50              | ----(Initial number of individuals)      |
| Offspring size K : 2430                           | ----(Total offspring)                    |
| R0 : 48.6   | ----(R0, the basic reproductive number)  |
| Longevity : [ 28.34 302.0644 23.5226 33.1574]     | ----(mean variance and CI for longevity) |
| Generation time : [ 26.884 151.77 26.3945 27.374] | ----(mean variance and CI for gen. time) |
| r : [0.20209, 0.198870, 0.2055]                   | ----(mean and CI for r)                  |
| lambda: [1.223964994, 1.22002366, 1.22814391]     | ----(mean and CI for lambda)             |
| Saved to: UpdatedData_added.csv                   | ----(outcome was saved to this file)     |