Simple Stats

Computer Science - Week 6  
Jul 1, 2024 - Version 0.3.1

Please make sure to place UD **email** AND **name** all members of your group below. Unless your UD emails are included in this table, then you will not earn any points for this assignment when it is graded! **Only one group member should submit the worksheet**.

Choose roles following the [instructions here](https://blockpy.cis.udel.edu/assignments/reading/bakery_appendix_pogil).

You should work in groups of 3. If you cannot find 3 group members, then work in groups of 2.

| **Role** | **Name** | **Email** |
| --- | --- | --- |
| **Manager** |  |  |
| **Speaker** |  |  |
| **Recorder** |  |  |

# 0) Setup

Download the following file as lead.py into the directory where you keep your other programs.

<https://gist.githubusercontent.com/acbart/ea3ca9db8579f0ba914779bdd7580c5f/raw/fd3b290bb01dbc350bf6af3800de5c9779079209/lead.py>

You will need to create a new file adjacent to that file, and name the new file simple\_stats.py.

Place the following code at the top of the simple\_stats.py file:

from lead import de\_school\_lead\_samples



# 1) Data Science

1.a. Define a function count\_samples that consumes a list of samples and produces an integer representing the number of samples.

|    |
| --- |

1.b. Write three unit tests for count\_samples.

|    |
| --- |

1.c. How many samples are there?

|  |
| --- |

2. What does PPB mean in this data? Don’t just say what it stands for; what does the term mean?

|  |
| --- |

3. Define three variables SAMPLE1, SAMPLE2, and SAMPLE3 that each contain a full string element taken from the lead.py file (from open single quote or apostrophe to close single quote or apostrophe). Then define an additional variable SAMPLES that is a list literal combining the other three variables.

|    |
| --- |

4.a. Define a function total\_lead that consumes a list of samples and produces an integer representing the total sum amount of lead (in PPB).

|    |
| --- |

4.b. Write three unit tests for total\_lead using the variables you defined in question 3.

|    |
| --- |

4.c. How much total lead is there across all the samples? Make sure you include the units!

|  |
| --- |

5.a. Define a function average\_lead that consumes a list of samples and produces a float representing the total amount of lead divided by the number of samples. Do NOT use a for loop; use your previously defined functions!

|    |
| --- |

5.b. Write three unit tests for average\_lead using the variables you defined in question 5.

|    |
| --- |

5.c. How much average lead is there in the samples? Make sure you include the units!

|  |
| --- |

6.a Define a function average\_lead\_per\_district that consumes a list of samples and the name of a school district, and produces a float representing the average amount of lead for that district. If no samples are provided, return 0 instead.

**Recommendation**: Use a helper function to filter out the district’s samples BEFORE you do anything else in the average\_lead\_per\_district function. You also might find the .strip() string method helpful.

|    |
| --- |

6.b. Write three unit tests for average\_lead\_per\_district.

|    |
| --- |

6.c. List three school districts from the original data and report the average amount of lead in those districts’ samples. Include the names of the schools and the units of measurement!

|  |
| --- |

7.a. Define a function highest\_lead that consumes a list of samples, and produces an integer representing the largest sample of lead. If no samples are provided, return 0 instead.

|    |
| --- |
|  |

7.b. Write three unit tests for highest\_lead.

|    |
| --- |

7.c. What is the highest amount of lead in all the samples?

|  |
| --- |

# 2) Interpretation

8. According to the [State of Delaware’s Public Health Alerts website](https://publichealthalerts.delaware.gov/safe-school-drinking-water/), what is an acceptable amount of lead?

|  |
| --- |

9. What does lead do to kids who drink even small amounts?

|  |
| --- |

10. What do you think is a safe amount of lead in your water?

|  |
| --- |

11. According to the EPA, how much lead is safe to drink? Do a google search and provide a link or citation.

|  |
| --- |

12. The ACLU of Delaware has [released a petition](https://action.aclu.org/petition/petition-fix-lead-contamination-de-schools) about the Delaware Schools Drinking Water situation. Summarize the petition’s key points.

|  |
| --- |

13. Do you think that the lead is only in Delaware public school’s water?

|  |
| --- |

# 3) Reflect and Review

Discuss among yourselves: what did you learn from this activity? What was surprising or interesting? If you didn’t learn anything, what do you think we were trying to teach you? How could this activity be improved?

|  |
| --- |
|  |
|  |

# Final Submission

When your team is happy with your answers for all the questions, download this file as a Word Document (docx) and upload the file to the appropriate assignment on Canvas.