

cse15l-lab-reports

Lab Report 3

Part 1 - Bugs

bug in ArrayExamples.java

1.

```
assertEquals(2.0, ArrayExamples.averageWithoutLowest(new double[]{1.0, 1.0, 2.0, 3.0}), .001);

static double averageWithoutLowest(double[] arr) {
    if(arr.length < 2) { return 0.0; }
    double lowest = arr[0];
    for(double num: arr) {
        if(num < lowest) { lowest = num; }
    }
    double sum = 0;
    for(double num: arr) {
        if(num != lowest) { sum += num; }
    }
    return sum / (arr.length - 1);
}
```

2.

```
assertEquals(3.5, ArrayExamples.averageWithoutLowest(new double[] { 2.0, 3.0, 4.0 }), 0.001);

static double averageWithoutLowest(double[] arr) {
    if(arr.length < 2) { return 0.0; }
    double lowest = arr[0];
    for(double num: arr) {
        if(num < lowest) { lowest = num; }
    }
    double sum = 0;
    for(double num: arr) {
        if(num != lowest) { sum += num; }
    }
    return sum / (arr.length - 1);
}
```

3.

```
%TESTC 1 v2
%TSTTREE1,test1(lab3Report),false,1,false,-1,test1(lab3Report),,
%TESTS 1,test1(lab3Report)
%FAILED 1,test1(lab3Report)
%TRACES
java.lang.AssertionError: expected:<2.0> but was:<1.6666666666666667>
%TRACEE
%TESTE 1,test1(lab3Report)
%RUNTIME9
```

```
%TESTC 1 v2
%TSTTREE1,test2(lab3Report),false,1,false,-1,test2(lab3Report),,
%TESTS 1,test2(lab3Report)
```

```
%TESTE 1,test2(lab3Report)
%RUNTIME7
```

1. Before

```
static double averageWithoutLowest(double[] arr) {
    if (arr.length < 2) {
        return 0.0;
    }
    double lowest = arr[0];
    for (double num : arr) {
        if (num < lowest) {
            lowest = num;
        }
    }
    double sum = 0;
    for (double num : arr) {
        if (num != lowest) {
            sum += num;
        }
    }
    return sum / (arr.length - 1);
}
```

After

```
static double averageWithoutLowest(double[] arr) {
    if (arr.length < 2) {
        return 0.0;
    }
    double lowest = arr[0];
    for (double num : arr) {
        if (num < lowest) {
            lowest = num;
        }
    }
    double sum = 0;
    boolean flag = false;
    for (double num : arr) {
        if (flag == false && num == lowest) {
            flag = true;
            continue;
        }
        sum += num;
    }
    return sum / (arr.length - 1);
}
```

1. The problem with the original code is that it removes all occurrences of the smallest number, but only subtracts 1 from the total number when taking the average.

I fixed it by removing only one occurrence of the smallest number. Unless the intended design is that all occurrences are to be removed, then I would have to subtract the number of numbers removed that were removed from the total.

Part 2 - Researching commands

4 grep options

1. `grep -r`: search recursively. It is useful for searching in all text files that are nested within directories.

i. source: <https://www.gnu.org/software/grep/manual/grep.html>

a. ex: `grep -r "monkeys is"` It is finding the occurrences of "monkeys is" in each file in the nested directories.

```
> grep -r "monkeys is"
./biomed/1471-2210-1-7.txt:      rats, mice and monkeys is well documented (for review see
```

b. ex: `grep -r "among us"` This finds all occurrences of among us within each nested directory.

```
> grep -r "among us"
./government/Post_Rate_Comm/ReportToCongress2002WEB.
txt:unreasonable discrimination among users of the mails, nor shall it
./biomed/1471-2261-3-5.txt:      clinically diagnosed valve disease among users of
```

2. `grep -i` : ignore case. This is useful if you do not care about whether a pattern is capitalized or not. This provide a broader search for what you are looking for.

i. source: <https://www.gnu.org/software/grep/manual/grep.html>

a. ex: `grep -i "MilwaukeE"` This finds all occurrences of milwaukee whether or not any of the leters are cpaitalized or not.

```
> grep -i "MILwaukeE"
./government/About_LSC/Strategic_report.txt:(Milwaukee)
./government/About_LSC/Strategic_report.txt:NLADA Annual Conference in Milwaukee to showcase best practices in
./plos/pmed.0010066.txt:      MRI was performed at 1.5 T
(System 9X, General Electric Medical Systems, Milwaukee,
./biomed/1471-2180-2-22.txt:      (Milwaukee, WI).
Nicotinamide-adenine dinucleotide (NAD),
./biomed/1471-2172-3-1.txt:      were purchased from Fluka (Milwaukee, WI). Nylon Hybond
./biomed/1471-2490-3-2.txt:      Electrical medical systems, Milwaukee, WI). The exposure
./biomed/1471-2210-2-4.txt:      purchased from Aldrich Chemical Co., Milwaukee, WI.
./biomed/1471-2121-3-21.txt:      2 ) was from Aldrich (Milwaukee, WI).
```

b. ex: `grep -i "RIZz"` This finds all occurrences of the substring rizz in any file regardless of case.

```
> grep -i "RIZz"
./government/Media/pro_bono_efforts.txt:By Russ Rizzo
./biomed/ar331.txt:      51]. Zhao and colleagues [ 52] identified frizzled (denoted
./biomed/ar331.txt:      Of potential importance is the fact that frizzled family
./biomed/ar331.txt:      colleagues in rheumatoid arthritis [ 53]. A new frizzled
./biomed/ar331.txt:      54]. Perhaps down-regulation of frizzled family members by
./biomed/1471-213X-2-7.txt:      frizzled (
./biomed/1471-213X-2-7.txt:      frizzled pathway regulates the
...
```

3. `grep -w` : search for whole word, not substring. This is useful when you want to search for the exact word insated of having it a part of a substring.

i. source: <https://www.gnu.org/software/grep/manual/grep.html>

a. ex: `grep -w "cysteine protease"` finds the two words together cystein protease.

```
> grep -w "cysteine protease"
./plos/journal.pbio.0020013.txt:      for the proteasome, in
addition to "classic" cysteine protease behavior
(Verma et al. 2002;
./biomed/1476-4598-2-25.txt:      Cathepsin B is a lysosomal cysteine protease, the
./biomed/1476-4598-2-25.txt:      cysteine protease. The cleavage of calpastatin by
./biomed/1471-2180-1-33.txt:      cysteine protease, SpeB [ 4 ] . Analysis of SpeB, SK and
./biomed/1471-2180-1-33.txt:      restored; however secretion of the cysteine protease, SpeB,
./biomed/1471-2180-1-33.txt:      405 over time. The cysteine protease
./biomed/1471-2180-1-33.txt:      the presence of a cysteine protease.
./biomed/gb-2002-3-12-research0077.txt:      cysteine protease [ 36]. JEvTrace also serves as a
./biomed/gb-2003-4-2-r9.txt:      these include a cysteine protease, falcipain-2
```

b. ex: `grep -w "explode"` Finds the exact match for the word explode.

```
> grep -w "explode"
./biomed/cc2190.txt:          enteral nutrition (explode) AND jejunal or post-pyloric
./911report/chapter-6.txt:
hit tanks, not people. It needed to be designed to explode in
a different way, and
```

4. `grep -l`: display file names which contain line matches. This is useful when you want to find the files that include the information that you want.

i. source: <https://www.gnu.org/software/grep/manual/grep.html>

a. ex: `grep -l "toilet"` This finds all the files that contain toilet. These names of the files can be used for further processing.

```
> grep -l "toilet"
./government/Media/Farm_workers.txt
./government/Media/Bridging_legal_aid_gap.txt
./biomed/1471-2458-3-2.txt
./biomed/1472-684X-1-5.txt
./911report/chapter-5.txt
./911report/chapter-6.txt
```

b. ex: `grep -l "killed.*air strike"` This finds the pattern of killed air strike and returns the names of all the files that contain this pattern.

```
> grep -l "killed.*air strike"
./911report/chapter-10.txt
```