

COMP482 Project 2: Conspiracy Theory

Due: 2355 June 28, 2023

Points: 30 points possible

Overview: The supposedly innocuous children's television show Sesame Street is actually an espionage program run by an alien race called the Snuffleupaguses (Snuffleupagii?, Snuffleupapodes?). They have learned our language, culture, mathematics, and technology, but they have not yet found our planet. This is why they are constantly asking "Can you tell me how to get to Sesame Street?". Fortunately, I have seen through the devious plan and have built two secret bunkers to protect the N most valuable humans. When the day of the Snuffpocalypse occurs and Snuffleupagus are rampaging the planet, I will text each of these valuable humans directions to one of the bunkers using the secret government program SSI/SSD (Snuffleupagus Safety Information / Snuffleupagus Strategic Defense). I will choose which bunker each person should report to based upon the cost of getting to the two bunkers.

I realize some of you might think this isn't real, but is it any less believable than:

- the "Great Human Die Off" when 4 billion people will starve to death during the 1980s as predicted by Paul Ehrlich (scientist) or
- the imminent collision (2003 or so) between Earth and planet Nibiru which will destroy all life on the planet as predicted by Nancy Lieder (website founder) citing "Zetans" or
- the end of the Mayan Long Count Calendar which causes the end of the universe in 2012 or
- the complete irrelevancy of masks to protect from COVID-19 as claimed by Anthony Fauci (medical doctor) in 2020 or the completely essential nature of masks to protect from COVID-19 as claimed by Anthony Fauci (medical doctor) in 2021 or the marginal effectiveness of masks to protect from COVID-19 as claimed by Anthony Fauci (medical doctor) in 2023 or
- the end of human civilization due to massive climate change by June 2023 as predicted by Greta Thunberg (child) citing "Science".

So be on the lookout for carpet covered elephants if you want to survive. :o)

Details: Your program will be provided with a file called input.txt which consists of one line that tells you the number of people N which will be an even number and then N lines each with two integers giving the cost for that person to get to Bunker One and Bunker Two.

You will calculate 2 values using greedy algorithms (you will need to determine the appropriate greedy algorithm yourself). The first value will be the minimum total cost to get each person to one of the bunkers. For this first value there are no restrictions on which bunker a person goes to or the capacity of each bunker or ... The second value will be the minimum total cost to get each person to one of the bunkers with the restriction that each bunker can only hold $N/2$ people (ie half the people need to be sent to Bunker One and half to Bunker Two).

Picky, but required specifications: Your project must:

- be submitted via canvas.
- consist of 1 or more dot-java files (no class files, zip files, input files, or other files should be submitted).
- have each file begin with a comment containing your name and the project number.
- not be placed into any package.
- have one file called Project2.java.
- compile with the command 'javac Project2.java'.
- run using the command 'java Project2'.
- accept input from a file called input.txt in the same directory as the java file(s) formatted precisely as described above.
- accomplishes the goal of the project. In other words, the output should be the correct answer formatted correctly.
- be submitted on time (early and multiple times is fine - do not be concerned if Canvas renames your file(s) by appending a hyphen and digit).

For each listed item you fail to follow, expect to lose at least 5 points. However, submitting via email will guarantee you a zero.

Examples:

If input.txt contains:

```
10
5 10
19 8
6 17
13 3
20 18
4 16
15 2
7 5
1 14
12 9
```

then the output would be

```
61
63
```

because for the first calculation you could assign persons 1, 3, 6, 9 to Bunker One and the rest to Bunker Two with total cost $5+8+6+3+18+4+2+5+1+9 = 61$ and for the second calculation you could assign persons 1, 3, 6, 8, 9 to Bunker One and the rest to Bunker Two with total cost $5+8+6+3+18+4+2+7+1+9 = 63$. Note that for calculation one you split the people up unevenly (4 and 6) while in the second you had to split them evenly (5 and 5).

If input.txt contains:

```
6
20 10
30 10
25 5
14 2
18 9
19 4
```

then the output would be:

```
40
71
```

If input.txt contains:

```
6
3 13
2 8
8 2
1 7
9 4
6 5
```

then the output would be

```
17
17
```