

Clothing Distribution Project

Summary:

Assume you have a collection of donated clothes and you plan to distribute them to a given group of children. Your goal is to distribute them as fairly as possible, while ensuring that the clothes fit and that each child gets at least one summer item and one winter item.

Information provided:

- Clothes
 - Size (S, M, L, XL, one-size-fits-all)
 - Season (summer, winter)
 - Retail price
- Children
 - Size

Example input (tab-separated values):

Clothes

A1	M	summer	8
A2	XL	summer	12
A3	ALL	winter	11

...

Children

C1	S
C2	XL
C3	M

...

Constraints:

Each clothing item is given to exactly one child

Clothing size must match the chosen child's size

Each child receives at least one summer item and one winter item

Objective:

- Let R = the sum of the retail prices for all of the clothing
- Let N = the number of children
- R/N = the fair share for each child
- Let C_i = the sum of the clothing prices for child i
- $|R/N - C_i|$ = the amount over/under that child i received
- Your project code must compute a distribution that will provide the **absolute minimum** value for D , where D is:

$$D = \sum_{i=1}^N \left| \frac{R}{N} - C_i \right|$$

Command line arguments:

./clothing inputFileName outputFileName

Example output format (tab-separated values):

```
C1      A5      A13     A20     32
C2      A2      A8       29
...
C24     A19     A33     31
D       12
```

Be sure to include the C_i values for each child, as the last value, and the D value on the last line of the output!

Rubric:

Item	Points
Compiles and runs with correct command line arguments on the clark server	25
Programming style	20
Correctly formatted output file	5
Optimal solutions returned	50

Notes:

Code must be written in C/C++

Signed Academic Integrity statement must be submitted