

Problem

Code a C program to find compatible, possible, mates for a client of a dating service company.

Discussion

The input to the program is in the file: "clients.dat". Skipping lines 1, 2 & 4, the format for the file is as follows:

columns	description
1 - 15	client's name
16 - 35	address
36 - 45	Phone number
47	Sex ('M' - male 'F' - female)
49 - 50	age
52-55	feet.inches (e.g., 5.11)
57-59	weight (pounds)
61-63	I.Q.
65-66	Education-years (0 ... 25)
68	personality (I, W, N, A, E) (Introverted, Wallflower, Normal, Active, Extroverted)
70 - 79	Interests- if the corresponding column is nonblank it denotes an interest in Art, Business, Films, Games, Literature, Music, Politics, Religion, Science, and Travel, respectively.

Table 1: Client data line format

Lines 1 & 2 of the data file are used for headings and can be ignored. Line 4 is used as a separator and can also be ignored. Line 3 contains the current client information for whom two lists of compatible clients will be output from the rest of the clients in the file starting on line 5. Note that for clients who have no interest in travel, the last column will be blank. However, this blank will most probably be truncated off by the operating system. Assume that there will be no more than 100 clients in the data file, including the current client. The client data must be read into an array of records, (struct).

The first compatible list, (the forlorn list;), will list clients who fit the following definition of compatible.

Forlornly Compatible:

Clients who are of the opposite sex, age difference is ≤ 5 , height difference ≤ 6 inches, are in the same Body Mass Index class, IQ difference ≤ 10 , Education Difference < 4 years, have the same personality type and they have at least two common interests.

The second compatible list, (the truly desperate list;), will list clients who fit the following definition of compatible.

Desperately Compatible:

Clients who are of the opposite sex, age difference is ≤ 10 , height difference ≤ 12 inches, are in the same Body Mass Index class or an adjacent class, IQ difference ≤ 20 , Education Difference < 8 years, have the same personality type or an adjacent type, and they have at least one common interest.

The formula for the computation of the Body Mass Index, BMI, is:

$$\text{BMI} = \left(\frac{\text{Weight}_{\text{pounds}}}{(\text{Height}_{\text{inches}})^2} \right) \cdot 705$$

Fig 1. BMI Formula

The Body Mass Index classes that will be used to determine compatibility are shown in the table below.

Men	Women	Weight
< 20.7	< 19.1	Underweight
20.7 to 26.3	19.1 to 25.7	Normal
26.4 to 27.7	25.8 to 27.2	Marginally overweight
27.8 to 31.0	27.3 to 32.2	Overweight
31.1 to 45.4	32.3 to 44.8	Severe overweight
> 45.4	> 44.8	Morbid obesity

Table 2: Body Mass Index Classes

Output

The compatible lists for the current client should be sorted by the client's names, appropriately labeled and saved in the "clients.out" file as shown in the example output below. (Note: the first 2 lines are only for column numbers and should not be output the same as the outline around the output.)

```
000000000111111111122222222233333333334444444445555555556666666666777777777788888888889
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Natural Electronic Reticent Dating Company												
Current Client:												
Name	Address	Phone	Sex	Age	Ht	BMI	IQ	Ed	P	Interests		
Doe, John	101 USA Str 24060	540-555-0210	M	25	5.11	25.4	109	16	N	FGL RS		
Close Compatible List:												
Name	Address	Phone	Sex	Age	Ht	BMI	IQ	Ed	P	Interests		
Doe, Jane	101 USA St 24060	540-555-0210	F	23	5.6	23.6	112	16	N	BF L R T		
Public, Mary Q.	231 First St 24712	304-444-9837	F	30	5.5	19.1	119	19	N	A F LMP		
Marginal Compatible List:												
Name	Address	Phone	Sex	Age	Ht	BMI	IQ	Ed	P	Interests		
Commons, Cathy	345 Thurd St 28465	412-777-8926	F	33	6.4	19.0	120	22	A	B G MP T		
Fair, Freda	456 Sixth St 27346	514-888-6532	F	19	5.10	25.8	90	12	W	A F R		
Stands, Sandi	567 One Ave 29573	603-999-1384	F	25	5.7	22.9	105	16	N	B LP		

Grading

Due Dates: Submit: Friday Dec. 5 Hardcopy: Friday Dec. 5

Turn in hard copies of the source code, output file and a top-down hierarchical design tree of the program. In addition, submit a diskette(s) with files containing: all project workspace files: (project file, source code, etc.), executable image, (.exe), and I/O files. The source code file must be named dating.cpp and the executable image named dating.exe. All materials to be graded must be placed in a sealed 9" x 12" folder, neatly labeled with your name, course number and date.

To receive partial credit for programs that are non-working, or are not fully functional, a brief one or two paragraph description of the problem(s) must be included in the assignment folder. The location, routine minimum, must also be specified along with possible corrections that need to be made.