

EEN118
Very Nice Easy Test
21st November 2013
Puppies and Books Forbidden

Name:

Student number:

Sign here if you did not give or receive aid in any form during this test,
and did not consult any written or printed material apart from this test:

Don't write in these boxes.

Question	Out of	Grade
5	33	
6	33	
7	33	
8	1	

5.

On my computer, I've got two grade files. One contains the grades from the first mid-term (`mt1.txt`), and the other contains the grades from the second mid-term (`mt2.txt`).

Each file has exactly the same format: a lot of lines each containing the name of the student (they are all quite famous, so they all have just one single short name) followed by four integer grades. Plus, the lines are all in alphabetical order.

Here is a very small example of the two files (the real ones are quite long):

mt1.txt

```
Bambi 25 13 30 0
Cher 11 21 17 1
Frank 31 25 26 1
Madonna 3 7 0 1
Zelda 19 28 25 1
```

mt2.txt

```
Bambi 31 27 17 0
Cher 26 19 21 1
Frank 33 20 24 1
Madonna 0 5 0 0
Zelda 33 29 33 1
```

As you can see, the two files have grades for the same students in the same order.

- A. Write a program that would read two files just like these (but longer) and combine them into a single file containing one line for each student, in the same order, with that one line now containing all eight of the student's grades. For the example above, the new file would be:

allmt.txt

```
Bambi 25 13 30 0 31 27 17 0
Cher 11 21 17 1 26 19 21 1
Frank 31 25 26 1 33 20 24 1
Madonna 3 7 0 1 0 5 0 0
Zelda 19 28 25 1 33 29 33 1
```

Write very clearly and leave yourself a lot of space, because for part B, you will be modifying this program.

Try to make it a whole program, with the correct C++ #includes, not `library.h`. Although this is not a major requirement.

Most of the points are for part A.

- B. Sometimes students are frightened by the first mid-term and drop the class. This means that the second file might have some people missing from it. The files could be something like this:

mt1.txt

```
Bambi 25 13 30 0
Cher 11 21 17 1
Frank 31 25 26 1
Madonna 3 7 0 1
Zelda 19 28 25 1
```

mt2.txt

```
Bambi 31 27 17 0
Frank 33 20 24 1
Zelda 33 29 33 1
```

But at least the two files will still be in alphabetical order.

Show the modifications to your program that would be required to handle dropped students properly. When a student does not appear in the second file, the new file should still show their grades from the first mid-term. So for the new example, the output would be:

allmt.txt

```
Bambi 25 13 30 0 31 27 17 0
Cher 11 21 17 1
Frank 31 25 26 1 33 20 24 1
Madonna 3 7 0 1
Zelda 19 28 25 1 33 29 33 1
```

6.

- A. Write a function that takes at least two parameters: a string S, and an array of strings A. It should search through A to see if S appears anywhere in it. If S is found, the function should return its position (remember that the first position in an array is numbered 0). If S is not found, the function should return -1.

so in this context

```
void main()
{ string names[] = { "Jilly", "Joe", "Jim", "Jenny", "Jemimah" };
  int p = find("Jenny", names, ...);
```

p should be set to 3.

- B. Write another function that takes at least two parameters: an integer position P, and an array of strings A. It should change the array A by “removing” the string which is at position P.

Of course, you can’t just leave a hole in an array. Removing a string is achieved by moving all following strings up by one position so that the unwanted one is overwritten, and noting that the array is now a little shorter than it used to be.

so after doing this

```
void main()
{ string names[] = { "Jilly", "Joe", "Jim", "Jenny", "Jemimah" };
  remove(2, names, ...);
```

names should contain "Jilly", "Joe", "Jenny", and "Jemimah".

- C. Making use of your answers to parts A and B, write another function that takes two arrays of strings. It should modify the first array by removing from it any string that appears anywhere in the second array.

Think before writing. There is a very easy way to do this.

7.

- A. A particular club whose members are interested in cats wants to computerise all their records. For each cat they record its name and colour (both strings), and its number of legs, weight, and value (all ints).
- + Design a struct or object suitable for representing cats.
 - + Provide a set function for initialising a cat object with those five pieces of information, and
 - + Provide a suitable print function for displaying the information for a cat nicely.

- B. It is in fact a club only for very special people who own exactly three cats, no more, no less. Every member has a name, and address, and three cats.
- + Design a struct or object suitable for representing members.
 - + Provide a set function for initialising a member object with those five pieces of information, and
 - + Provide a suitable print function for displaying the information for a club member nicely.

- C. For entertainment, the club members sometimes set up fights between their cats (I said they were *special* people, not *nice* people). They have discovered a few things:
- + A cat with 4 legs always defeats a cat with some other number of legs.
 - + If that does not settle the matter, heavier cats always beat lighter cats.
 - + If that leaves the result unresolved, cheaper cats always beat more expensive cats.
 - + After that, the winner is just random.

Write a function that takes two cat parameters and determines the outcome of a fight between them. It should return 1 if the first cat parameter wins, and 2 if the second wins.

- D. The club members also have contests against each other. When member A battles member B, this is how it works. They make A's first cat fight B's first cat, then they make A's second cat fight B's second cat, then they make A's third cat fight B's third cat.

Whoever's cats win most times (it can't be a tie because they all have three cats) is the winner. The defeated member has his name officially changed to "Mr. Loser".

Write a function that carries out the battle between two club members.

8.

Why do cats like arrays? Answer with in illustration, diagram, or picture.