

Name:	ID:
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Theory

	<i>Result</i>
<p>Given the following binary numbers represented in two's complement, determine the correct relation (greater, equal, lesser):</p> <p>a. 10110 <?> 11010 b. 101 <?> 11101</p>	<p>a.:</p> <p>b.:</p>
<i>Calculations</i>	

<p>Determine the minimum size of the following structure (remember that double are 64 bit long)</p> <pre>struct artist { char name[16]; char surname[16] char works[16][32]; double popularity_index; }</pre>	<i>Result</i>
<i>Calculations</i>	

What is the system BUS? Which are its functions?

Programming

Write a C program for managing the database of a music company. All information is stored in a single text file. Such details a list of records. In each line: release year, artist's name, album's title. For instance:

```
1986 queen a_kind_of_magic
1986 zucchero rispetto
1976 queen a_day_at_the_races
1995 zucchero diamante
2005 jovanotti buon_sangue
1987 zucchero blue's
1986 queen the_best_of
```

Assumptions:

- Fields are separated by a single space
- The total number of records (lines) is not known
- The release year is 4 digits
- The artist's name does not exceed 30 characters, does not contain spaces, and it is composed of lowercase letters.
- The album's title does not exceed 50 characters, and does not contain spaces.
- Lines are not sorted
- The same artist may publish several albums in the same year
- The discography covers the last 50 years (from 1962 to 2012)

The program receives on the commandline: (1) the name of the file containing the database; (2) an option; (3) a string.

If the option is “-p”, then the third parameter specifies a year. The program should show all records released before that year (artist's name and album's title). Moreover, it must show the number of distinct years where some record appears.

If the option is “-t”, then the third parameter is the name of an album. The program should print all data for the album: release date and artist's name.

Example (database is album.txt):

```
C:\> prog.exe album.txt -p 1987
1986 queen a_kind_of_magic
1978 rockets on_the_road_again
1976 queen a_day_at_the_races
1986 zucchero rispetto
Distinct years: 3
```

or:

```
C:\> prog.exe album.txt -t blue's
1987 zucchero
```

Name:	ID:
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Theory

	<i>Result</i>
<p>Given the following binary numbers represented in two's complement, determine the correct relation (greater, equal, lesser):</p> <p>a.10110 <?> 11010 b.101 <?> 11101</p>	<p>a.:</p> <p>b.:</p>
<i>Calculations</i>	

<p>Determine the minimum size of the following structure (remember that float are 32 bit long)</p> <pre> struct employee { char name[16]; char surname[16] char ssn[8]; char date[8]; float salary; } </pre>	<i>Risultato</i>
<i>Calculations</i>	

Describe the basic <i>machine cycle</i> in a computer. It is suggested to add a sketch.

Programming

Write a C program for managing the database of a music company. All information is stored in a single text file. Such details a list of records. In each line: release year, artist's name, album's title. For instance:

```
1986 queen a_kind_of_magic
1986 zucchero rispetto
1976 queen a_day_at_the_races
1995 zucchero diamante
2005 jovanotti buon_sangue
1987 zucchero blue's
1986 queen the_best_of
```

Assumptions:

- Fields are separated by a single space
- The total number of records (lines) is not known
- The release year is 4 digits
- The artist's name does not exceed 30 characters, does not contain spaces, and it is composed of lowercase letters.
- The album's title does not exceed 50 characters, and does not contain spaces.
- Lines are not sorted
- The same artist may publish several albums in the same year
- The total number of artists in the database is 50

The program receives on the commandline: (1) the name of the file containing the database; (2) an option; (3) a string.

If the option is “-a”, then the third parameter specifies a year. The program should show all records released in that year (artist's name and album's title). Moreover, it must show the number of distinct artists active in that year.

If the option is “-b”, then the third parameter is the name of an artist. The program should show all records by that artist (release date and album's title).

Example (database is album.txt):

```
C:\> prog.exe album.txt -a 1986
queen a_kind_of_magic
zucchero rispetto
queen the_best_of
Distinct artists: 2
```

or:

```
C:\> prog.exe album.txt -b zucchero
l'output del programma dovrà essere il seguente:
1986 rispetto
1995 diamante
1987 blue's
```