Philippine Population [contributed by F. R. Salvador]

Data about the Philippine population from year 2000 to 2005 are given in the following table. The first row means that the population at the end of 2000 was 77991569, and at the end of year 2005 it was 86274237.

YEAR	POPULATION
2000	77991569
2001	79665315
2002	81352060
2003	83031954
2004	84678493
2005	86274237

For this problem, assume that:
- 60% of the total population are adults (i.e., at least 18 years old)
- 51% of the total population are females (there are more females than males in the Philippines)
- 11% of the underlined adult population are senior citizens (i.e., at least 60 years old)

PRELIMINARY TASK (not graded yet): Answer the following questions. *Do the computations manually or with a calculator or with a spreadsheet like Excel. Do NOT create a program yet.*
- In year 2000, how many (a) adults, (b) females and (c) senior citizens were there?
- The population increases annually! What is the annual population growth rate (in percent) in year 2001?

The corresponding answers to the questions above are:
- In year 2000, there were (a) 46794941.40 adults, (b) 39775700.19 females and (c) 5147443.55 senior citizens respectively. Note that these numbers are not integers but with fractional components because of the percentage computations.
- The 2001 annual population growth rate is computed as (79665315 - 77991569)/ 77991569 * 100 = 2.146060 percent. This means that there was approximately 2.15% increase in the population at the end of 2001.

ACTUAL GRADED TASK: Write 5 separate functions that will compute and return a value that answers the five questions listed below.

Q1: How many males were there in year **<param_year>**?
Q2: How many senior citizens were there in year **<param_year>?**
Q3: What is the annual population growth rate (in percent) in year **<param_year>?**
Q4: What is the lowest annual population growth rate?
Q5: What is the average annual population growth rate?

<param_year> is a function parameter that specifies the actual year. For example, an actual question Q1 can be posed as "Q1: How many males were there in year 2000?"

You are given the following accompanying files:
- **population.h** is a header file that contains the macro definitions and function prototypes of the functions that you need to define
- **POPULATION-LASTNAME.c** is the skeleton file where you will encode your five function definitions
- **main.c** contains the main() function that you need to complete and you'll need to use to test your five functions
- **POPULATION.txt** is a text file that contains the sample input population data
- **ANSWER.txt** is a text file that contains the answers to the questions above when param_year is 2000 for Q1 and Q2, and param_year is 2001 for Q3.

Make sure to rename the skeleton file with your own last name. For example, if your lastname is SANTOS, you should have a file named POPULATION-LASTNAME.c.

HINT: To reduce the time needed to input data from the keyboard, run your exe file in the command line with input redirection. You can store the result of your program into a text file by output redirection, For example, if your last name is SANTOS, then you can run your executable program with I/O redirection as:

C:\CCPROG2> POPULATION-SANTOS < POPULATION.txt > SANTOS-RESULT.txt

The output of the exe file will be stored in SANTOS-RESULT.txt file. A correct program should produce the same set of values that are in ANSWER.txt using the same param_year as specified above.

TESTING & GRADING:

- Your program will be black box tested by your instructor with MORE population data, specifically from 2000 to 2017.
- A program with a compilation error will AUTOMATICALLY result into a score of 0. Make sure that there are no syntax/compilation errors in your solution.
- Each correct function implementation is worth 10 points. The score for an incorrect implementation of a required function is 0. For example, if only the solutions for Q1, Q2 and Q3 are correct, then the score will be 30/50.

DELIVERABLES:

Submit/upload two files via Canvas before the indicated deadline:
1. your POPULATION-LASTNAME.c source file
2. your LASTNAME-RESULT.txt output text file

Don't forget to change the filename to your own last name.

-- The End --