

CS 1336 Programming Assignment

Total Points (100 pts)

Assignment #2

Your second programming assignment consists of two C++ programs. It should compile correctly and produce the specified output. Give meaningful name to the program and submit it to eLearning.

Please note that the program should comply with the commenting and formatting rules we discussed in class.

Program #1

Write a program that satisfies the requirements described in Chapter 3 Programming Challenges #5.

The problem statement is included below for efficiency:

5. Male and Female Percentages

Write a program that asks the user for the number of males and the number of females registered in a class. The program should display the percentage of males and females in the class.

Hint: Suppose there are 8 males and 12 females in a class. There are 20 students in the class. The percentage of males can be calculated as $8 \div 20 = 0.4$, or 40%. The percentage of females can be calculated as $12 \div 20 = 0.6$, or 60%.

Make sure you declare males and females as int values. The percentages should be in double type.

Make your output look as much like the sample output provided below as possible.

```
Enter the number of male students: 25
```

```
Enter the number of female students: 17
```

```
For the 42 students in the class the male and female percentages are:
```

```
Male: 59.5238%
```

```
Female: 40.4762%
```

Program #2

[US government website](#) says the following interesting information: In 2017, the average annual electricity consumption for a U.S. residential utility customer was 10,399 kilowatthours (kWh), an average of 867 kWh per month. Louisiana had the highest annual electricity consumption at 14,242 kWh per residential customer, and Hawaii had the lowest at 6,074 kWh per residential customer.

Let us compute the electricity usage and the bill for last month by asking a few questions to a homeowner. Here are the input parameters and output format.

Input:

of light bulbs

Average # of hours each bulb is ON in a day

AC unit's power

Typical # of hours AC unit is ON in a day

of FANs

Average # of hours each Fan is ON in a day

Per-unit price of electricity

Formatted output:

Total electricity usage: NNNN kWh

Bulbs: XX.X% AC: YY.Y% FANs: ZZ.Z%

Electricity bill for the month: \$ NNNN.NN

Notes:

- Assume that each bulb consumes 60W and each fan consumes 40W.
- Assume that the home has only one AC unit and all other appliances including cooking range use other energy sources, NOT electricity. AC unit power is specified in watts.
- 1 kWh stands for 1000 Watt-hours and it is considered as 1 unit of Electricity and the per-unit price is specified in cents.
- Assume that the last month had 30 days.

HINTS/Pseudocode:

- Calculate the total for Bulb usage, Fan usage and AC usage in KWH
- Calculate total usage by adding the total for Bulb usage, Fan usage and AC usage
- Calculate the **percentage** of each usage wrt total usage
- Calculate electricity bill in **dollars**. Remember the price is specified in cents

Here is the sample input:

```
Num of light bulbs: 10
Average num of hours each bulb is ON in a day: 2.4
AC unit's power: 900
Typical num of hours AC unit is ON in a day: 10.5
Num of FANs: 4
Average num of hours each Fan is ON in a day: 8.5
Per-unit price of electricity: 9.5
```

Here's how the corresponding output should look:

```
Total electricity usage: 368 kWh
Bulbs: 11.8% AC: 77.1% FANs: 11.1%
Electricity bill for the month: $ 34.91
```

This is how your assignment2 will be graded

Electricity Bill:

- | | |
|---|-------------|
| 1. Pseudocode | (7 points) |
| 2. variables, constants (literals, symbolic and named) in your program. | (10 points) |
| 3. Style of coding | (5 points) |
| 4. Functional code | (20 points) |
| 5. 4 runs and paste the outputs of the run in the end of the program | (20 points) |

Male and Female Percentage

- | | |
|---|------------|
| 1. Pseudocode | (3 points) |
| 2. variables, constants (literals, symbolic and named) in your program. | (5 points) |

- | | |
|--|--------------------|
| 3. Style of coding | (5 points) |
| 4. Functional code | (15 points) |
| 5. 4 runs and paste the outputs of the run in the end of the program | (10 points) |