# INTRODUCTION TO COMPUTER PROGRAMMING: FUNDAMENTALS OF C

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## → Lab 1: if/else

1. Write a program that prompts the user for three numbers and outputs whether the third number is strictly between the first number and the second number.

2. Write a program that prompts the user for a letter and outputs whether the letter is uppercase.

3. Write a program that prompts the user for the number of years of schooling and displays a message indicating the educational level (0, none; 1–5, elementary school; 6–8, middle school; 9–12, high school; more than 12, college). Print a message to indicate bad data as well.

4. Write an interactive program that contains an if statement that may be used to compute the volume of a cube ($volume = side^3$) or a sphere ($volume = \frac{4}{3}\pi r^3$) after prompting the user to type the first character of the figure name (C or S).

5. Write a program that prompts the user to enter the month and year, and displays the number of days in the month. For example, if the user entered month 2 and year 2000, the program should display that February 2000 has 29 days. If the user entered month 3 and year 2005, the program should display that March 2005 has 31 days.

6. Write a program that first prompts the user for the sunset hour and sunset minute, then outputs "Good morning.", "Good afternoon.", or "Good evening." depending on whether the current time is midnight-noon, noon-sunset, or sunset-midnight respectively. You will need to retrieve the current time (24 hour format). To do so, include the following code in your program:

```
time_t t;
struct tm *now;
```

```
t = time(0);              /* get current time */
now = localtime(&t);      /* adjust for local timezone */
int hour = now->tm_hour; /* retrieve current hour */
int min = now->tm_min;    /* retrieve current min */
```

You will also need to include the time.h library (`#include <time.h>` at the top of your file).

7. Add a prompt to the above program asking "How many minutes from now do you expect to be home?", and output a sentence saying "You will get home at HH:MM".


Exercises are adapted from the following sources:

1. Hanly, J. R. (2012). *Problem solving and program design in C*. Pearson Education.
2. Liang, Y. D. (2007). *Introduction to Java programming: comprehensive version*. Pearson Prentice Hall.
3. Sedgewick, R., & Wayne, K. (2007). *Introduction to programming in Java: an interdisciplinary approach*. Addison-Wesley Publishing Company.
4. Shankar, S. (2017). CSCI 136 Lab Instructions.