Program 1: ISBN Numbers

Due date: Friday, october 2, 11:59pm.

1 Purpose

To write a program requiring use of variable declarations, reading values into and writing the values stored in variables, assignment statements, conditional statements, simple math computations and printing output to console.

Programming environment. This is a solo programming project. You are responsible for all the work related to the program development, testing and submission.

Collaboration. **Any** collaboration between peers, as well as any collaboration with outside sources is **strictly prohibited**. If you have any questions, concerning the assignment, please consult the instructor.

2 Program Description

In this project you will create a simple program to compute the 'checkSum' number used as the last digit in the ISBN numbering system.

The International Standard Book Number (ISBN) is a unique, numerical commercial book identifier, based upon the 9-digit Standard Book Numbering (SBN) code. These numbers can be found on most books. For example

- 3-540-61545-8
- 1-234-56789-X

The first nine digits are assigned by the publisher and the last symbol is computed from the previous digits and used as checkSum number to errors in ISBN numbers. The last digit is computed as a weighted sum of the first 9 digits as follows.

- First sum the first digit and

- 2 times the second digit, plus
- 3 times the third digit, plus
- etc....
- 9 times the ninth digit
- Then compute the remainder of dividing the sum by 11.
- If the remainder is less then 10, then the remainder becomes the checkSum;
- otherwise the checkSum is the symbol 'X'

3 Program Specifications

Write a small C program which prompts the user to input 9 individual numbers of the ISBN number. The program will then compute the checkSum and print out the entire ISBN number. All prompts and output should match the following examples word for word!

The first output line shall contain the text `"ISBN checkSum computation program"`

1. The first prompt shall be

   ```
   Please enter the first digit of the ISBN number:
   ```

   The program shall read in the first digit of the ISBN number.

2. The second prompt shall be

   ```
   Please enter the second digit of the ISBN number:
   ```

   The program shall read in the next digit of the ISBN number.

3. The third prompt shall be

   ```
   Please enter the third digit of the ISBN number:
   ```

   The program shall read in the next digit of the ISBN number.

4. Repeatedly prompt the user for all nine digits, with the final prompt being

   ```
   Please enter the ninth digit of the ISBN number:
   ```

   The program shall read in the ninth digit of the ISBN number.

5. Your program will then compute the checkSum given the algorithm description above and print out the final ISBN number. Output should be printed as follows:

   ```
   ISBN is: x-xxx-xxxxx-x
   ```

   where 'x' is replaced with appropriate values. After this line is printed, your program shall stop.

General Notes

Math. You are responsible for the remainder of the program design for this program. In particular, you are responsible for coming up with the correct math to compute the outputs of the program based on the inputs.

Program name. Name your program `isbn.c`.

ANSI C. Your program shall be written in ANSI C. The instructor will compile your program using the following `gcc` flags:

```
gcc -ansi -Wall -pedantic
```

Any program that does not compile in this fashion will be assigned a score of 0.

Style. Your code will checked for style. Your program shall conform to the style described at

http://users.csc.calpoly.edu/~cstaley/General/CStyle.htm

In addition, the header comment shall include your name, the date, and one sentence describing the program. You must note in the header any errors in your program.

Any style violations are subject to an automatic 10% penalty.

Testing. Please test your code on all available ISBN numbers you find at hand. You will be provided with the instructor's binary and with a set of test cases for testing your program. Both will be released to you at the beginning of next week. Once test cases become available to you, make sure you test your code against the instructor's binary and ensure complete match of the outputs.

Any program that fails any of the public tests will not receive more than 30% of the grade.

4 Submission Instructions

Submission.

Files to submit. You shall submit the `isbn.c` file.

Submission procedure. You will be using `handin` program to submit your work. The procedure is as follows:

- `ssh` to `vogon` (`vogon.csc.calpoly.edu`).
- Students shall execute the following submission command:

  ```
  > handin zwood csc101p1  isbn.c
  ```

  Note that you may submit your file more then once. Any later submissions, write over the previous submission and the latest time stamp is displayed. No late submissions are allowed!

5 Sample Output

The followings shows two different runs of the program with two different input values

```
> a.out
ISBN checkSum computation program
Please enter the first digit of the ISBN number: 1
Please enter the second digit of the ISBN number: 2
Please enter the third digit of the ISBN number: 3
Please enter the fourth digit of the ISBN number: 4
Please enter the fifth digit of the ISBN number: 5
Please enter the sixth digit of the ISBN number: 6
Please enter the seventh digit of the ISBN number: 7
Please enter the eighth digit of the ISBN number: 8
Please enter the ninth digit of the ISBN number: 9
ISBN is: 1-234-56789-x
> a.out
ISBN checkSum computation program
Please enter the first digit of the ISBN number: 3
Please enter the second digit of the ISBN number: 5
Please enter the third digit of the ISBN number: 4
Please enter the fourth digit of the ISBN number: 0
Please enter the fifth digit of the ISBN number: 6
Please enter the sixth digit of the ISBN number: 1
Please enter the seventh digit of the ISBN number: 5
Please enter the eighth digit of the ISBN number: 4
Please enter the ninth digit of the ISBN number: 5
ISBN is: 3-540-61545-8
```