

Programming Projects

1. Write a program that accepts a date from the user in the form *mm/dd/yyyy* and then displays it in the form *yyyymmdd*:

Enter a date (mm/dd/yyyy): 2/17/2011
 You entered the date 20110217

2. Write a program that formats product information entered by the user. A session with the program should look like this:

Enter item number: 583
 Enter unit price: 13.5
 Enter purchase date (mm/dd/yyyy): 10/24/2010

Item	Unit Price	Purchase Date
583	\$ 13.50	10/24/2010

The item number and date should be left justified; the unit price should be right justified. Allow dollar amounts up to \$9999.99. *Hint:* Use tabs to line up the columns.

3. Books are identified by an International Standard Book Number (ISBN). ISBNs assigned after January 1, 2007 contain 13 digits, arranged in five groups, such as 978-0-393-97950-3. (Older ISBNs use 10 digits.) The first group (the *GS1 prefix*) is currently either 978 or 979. The *group identifier* specifies the language or country of origin (for example, 0 and 1 are used in English-speaking countries). The *publisher code* identifies the publisher (393 is the code for W. W. Norton). The *item number* is assigned by the publisher to identify a specific book (97950 is the code for this book). An ISBN ends with a *check digit* that's used to verify the accuracy of the preceding digits. Write a program that breaks down an ISBN entered by the user:

Enter ISBN: 978-0-393-97950-3
 GS1 prefix: 978
 Group identifier: 0
 Publisher code: 393
 Item number: 97950
 Check digit: 3

Note: The number of digits in each group may vary; you can't assume that groups have the lengths shown in this example. Test your program with actual ISBN values (usually found on the back cover of a book and on the copyright page).

4. Write a program that prompts the user to enter a telephone number in the form (xxx) xxx-xxxx and then displays the number in the form xxx.xxx.xxx:

Enter phone number [(xxx) xxx-xxxx]: (404) 817-6900
 You entered 404.817.6900

5. Write a program that asks the user to enter the numbers from 1 to 16 (in any order) and then displays the numbers in a 4 by 4 arrangement, followed by the sums of the rows, columns, and diagonals:

Enter the numbers from 1 to 16 in any order:
16 3 2 13 5 10 11 8 9 6 7 12 4 15 14 1

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16  3  2 13
 5 10 11  8
 9  6  7 12
 4 15 14  1

```

Row sums: 34 34 34 34

Column sums: 34 34 34 34

Diagonal sums: 34 34

If the row, column, and diagonal sums are all the same (as they are in this example), the numbers are said to form a ***magic square***. The magic square shown here appears in a 1514 engraving by artist and mathematician Albrecht Dürer. (Note that the middle numbers in the last row give the date of the engraving.)

6. Modify the `addfrac.c` program of Section 3.2 so that the user enters both fractions at the same time, separated by a plus sign:

Enter two fractions separated by a plus sign: 5/6+3/4

The sum is 38/24