Computer Programming

Lab4

Apr. 1, 2025

Ex1

- (*Factorization*) Find prime factors of an input positive integer. (not including 1)

```
n = 126

→ All prime factors are 2, 3, 3, 7
```

Ex1

- **Problem setup**

  1) Ask the user to enter a positive integer, read it using **scanf()**, and store it as an integer variable **n**.

  2) Try to divide **n** by an integer (starting from 2). If divisible, print the integer as a factor of **n** and update **n** as the quotient. Otherwise, increment the integer for next test.

  3) Repeat Step 2). In the *loop*, carefully identify the terminating condition.

  4) Print all the prime factors to output screen.

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Ex1

- **Program output**

```
[ohyong@cse Lab4]$ vi ex4_1.c
[ohyong@cse Lab4]$ gcc ex4_1.c -o ex4_1
[ohyong@cse Lab4]$ ./ex4_1

Enter an integer: 126
The prime factors of 126 are 2  3  3  7
[ohyong@cse Lab4]$ ./ex4_1

Enter an integer: 84
The prime factors of 84 are 2  2  3  7
[ohyong@cse Lab4]$ ./ex4_1

Enter an integer: 24
The prime factors of 24 are 2  2  2  3
```

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Ex2

- *(Vowels counting)* For a given single-line sentence, count and display the number of *each* vowel in the sentence, using the **switch** statement. Don't use arrays.

> Each character will be read until the end of the line.

- Refer to Figure 4.7 in Chapter 4.

```
while ( ( ch = getchar() ) != '\n'  )
{

    …

}
```

> Assignment returns the character read to **ch**

```
GIST college is awesome!
→
The number of 'a' or 'A' is 1,
The number of 'e' or 'E' is 4,
The number of 'i' or 'I' is 2,
The number of 'o' or 'O' is 2,
The number of 'u' or 'U' is 0
```

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Ex2

- **Program output**

```
[ohyong@cse Lab4]$ vi ex4_2.c
[ohyong@cse Lab4]$ gcc ex4_2.c -o ex4_2
[ohyong@cse Lab4]$ ./ex4_2

Enter a sentence: GIST college is awesome!

The number of 'a' or 'A' is 1,
The number of 'e' or 'E' is 4,
The number of 'i' or 'I' is 2,
The number of 'o' or 'O' is 2,
The number of 'u' or 'U' is 0
```

```
[ohyong@cse Lab4]$ ./ex4_2

Enter a sentence: Have a fun holiday.

The number of 'a' or 'A' is 3,
The number of 'e' or 'E' is 1,
The number of 'i' or 'I' is 1,
The number of 'o' or 'O' is 1,
The number of 'u' or 'U' is 1
```

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Submission

- **Submit to server**

Lab #

Class #

At the end of the Lab4, submit your C sources file by typing

~gs1401/bin/submit Lab4_2 ex4_1.c ex4_2.c   // by Thur.   11:50

~gs1401/bin/submit Lab4_3 ex4_1.c ex4_2.c   // by Friday 10:50

~gs1401/bin/submit Lab4_4 ex4_1.c ex4_2.c   // by Friday 11:50

~gs1401/bin/submit Lab4_5 ex4_1.c ex4_2.c   // by Friday 13:50

You may check that you have submitted your source code correctly by typing

~gs1401/bin/submit -check