More Practise with Expressions

Purpose:

To demonstrate an understanding of basic input and output in JAVA.

Due Date:

The completed lab assignment is due Monday 2008-01-28 *at the beginning of lecture*.

Problems from the Textbook[1]

Programming Challenge: 12. String Manipulator

Write a program that asks the user to enter the name of his or her favourite city. Use `String` variables to store the input. The program should display the following:

- The number of characters in the city name
- The name of the city in all uppercase letters
- The name of the city in all lowercase letters
- The first character in the name of the city

Programming Challenge: 13. Word Game

Write a program that plays a word game with the user. The program should ask the user to enter the following:

- Her or his name
- Her or his age
- The name of a city
- The name of a post-secondary institution
- A profession
- A type of animal
- A pet's name

After the user has entered these items, the program should display the following story, inserting the user's iinput into the appropriate locations:

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[1] *Starting Out with* JAVA*TM: From Control Structures through Objects* by Tony Gaddis. Addison-Wesley. 2008.

> There once was a person named *name* who lived in a *city*. At the age of *age*, *name* went to school at *post secondary institute*. *Name* graduated and went to work as a *profession*. Then, *Name* adopted a(n) *animal* named *Petname*. They both lived happily ever after!

Other Problems

3. Write a program to determine the precise rules used by the % operator when negative numbers are involved. That is, determine what expressions like (-8) % (-3), (-8) % 3, and 8 % (-3) compute. If possible state the precise rule used by JAVA.

4. Here are some questions about equality of Strings.

- Is ("cat"==("c"+"at"))?
- Is ("cat"=="CaT".toLowerCase()?
- Is ("cat".equals("c"+"at"))?
- Is ("cat".equals("CaT".toLowerCase())?

Write a program that tests the values of these expressions. Explain your results.

5. We spent a long time talking about the binary representation of numbers, but have not yet used this information. There are four operators that work directly with the bits of integers:

~	not	unary. changes 1's to 0.s and vice versa.
|	or	binary. yields 1 where either argument bit is 1.
&	and	binary. yields 1 where both argument bits are 1.
^	exclusive or	binary. yields 1 where exactly one argument bits is 1.

These operators work *bitwise*. For instance, 2|1 is 3, because (the last bits of) 2 are 10 and of 1 are 01. On the other hand, 2&1 is 0.

Write a program to determine the values of • (5 | 6) • (5 & 6) • (5 ^ 6) • (~ 5), and print them out. Are they what you expected?