Java Expressions and Control Structures
CS401 Lab3

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Outline

1. Introduction
2. Background
3. Program
Practise what you have learned

- **while** loops
- **for** loops
- **do** loops
- **if** statements
- **switch** statements
- **Scanner**
What should be done

1. Show me that your program compiles and executes correctly (10 points)
2. Answer a short question about how you solved the problem (5 points)
3. Submit your Java program to the lab1 sub-directory of your submission directory on the CS401 Submission Site (5 points)

This Lab is being graded!
It is worth 2 points for your final grade.
What will be implemented:

\[ f(b, X) = \lfloor \log_b(X) \rfloor \]

\[
f(10, 123456) = \lfloor \log_{10} 123456 \rfloor = 5^a
\]

\[ ^a \text{Because } 10^5 = 100000 \leq 123456 \text{ and } 10^6 = 1000000 > 123456 \]

\[
f(2, 64) = \lfloor \log_2 64 \rfloor = 6^a
\]

\[ ^a \text{Because } 2^6 = 64 \leq 64 \text{ and } 2^7 = 128 > 64 \]

Refer to the details on [http://www.cs.pitt.edu/~ramirez/cs401/labs/lab3.html](http://www.cs.pitt.edu/~ramirez/cs401/labs/lab3.html)
Your mission:

1. Write a program.
   1. Asks the user to enter an integer base $b > 1$ (if the number is $\leq 1$ you should quit the program)
   2. Asks the user to enter a positive integer X. Numbers $\leq 0$ should be rejected and the user must re-enter.
   3. Calculates the floor of $\log_b X$ in the manner indicated above and outputs the result

2. Demonstrate it to me by running with various inputs.
3. Answer a question.
4. Submit it to the lab1 subdirectory in front of me.