# **CIS 36A :: LAB 3 - Control Statements**

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## Task 1: Definitions & Concepts

**Instructions:** Answer the questions below.

1. What is the difference between *for* loop and *while* loop?   
   => Answer: For loop , use when you know the number of iterations beforehand or need to iterate over specific range. While loop. Use when the number of iterations is not known beforehand.
2. When is a good time to use a ***do-while*** loop instead of a ***while*** loop?  
   => Answer: a good time to use a do while loop instead of a while loop is when you need to ensure that the loop body executes at least once, regardless of whether the loop condition is initially true or false.

## Task 2: Understanding Programming

Instructions: Answer each question below. Try to understand and explain the code.   
**Do not put an IDE code screenshot.**

1. What is the difference between 5, ‘5’,”5”?  
   => Answer: 5 : integer literal (int)

‘5’ : character literal (char),representing the character ‘5’.

“5”: String literal (String), representing the String “5”.

1. Write a single-line ***for***statement for a loop that counts from 2000 to 100 by -4.  
   => for (int I = 2000; I >= 100; i -= 4)
2. Is the following fragment valid? Why or why not? Assume that **sum** and **count** have been declared and initialized already.   
   for(int i = 0; i < 10; i++)   
    sum += i;  
   count = i;  
   => Answer: The given fragment is incorrect, because the variable declared outside parenthesis, it only loops inside the scope .
3. What does the following fragment print?  
    for(int i = 0; i < 10; i++){  
    System.out.print(i + " ");  
    if(i%2 == 0) continue;  
    System.out.println();  
    }  
   => Answer: it will print from 0 to 9.

## Task 3: Programming Exercises

Instructions: Use any IDE to write and execute below exercises from the book chapter 3. Attach Snipping photos of your source code and test run of the code in the console. Make sure your code is readable.

**Try This:**

1. Do the TRY THIS 3-1 (Page 87), 3-2 (Page 99), and 3-3 (Page 110).   
   Do not Submit –   
   - I tried.

**Chapter Exercises: Do the following chapter exercises.**

* Exercise 1: Write a program that reads characters from the keyboard until a ***'Q'***is received. Have the program count the number of **'A'**s. Report the total at the end of the program.

A screenshot of a computer program

Description automatically generated

* Exercise 16: Write a program that uses a loop to print the powers of 3 from 30 up to and including 39

A computer screen shot of a program

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* **Exercise 18:** The class FindFac discussed in this chapter prints the factors of all numbers from 1 to 100. Modify this class so that, instead of stopping at 100, it keeps going until it finds a number with exactly nine factors.

A screenshot of a computer program

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* Exercise 23: If you divide 1 by 2, you get 0.5. If you divide it again by 2, you get 0.25. Write a program that calculates and outputs the number of times you have to divide 1 by 2 to get a value less than one ten-thousandth (0.0001)

A screen shot of a computer program

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## Task 4: Programming Application

### Guessing game

**Step 1:** Create a java class called GuessingGame. Your program should pick a random integer between 1 and 100. Then, it should ask the user to guess the number and should give feedback whether the number is greater than or less than the original number. You should create a loop to either ask the user for a number of times or until the user guessed the number correctly. The loop should end when the user guesses the number.

**Step 2:** Give points to the users based on how fast they guess the number and negative points if it takes more than a certain amount of guesses

**Step 3:** Ask the users whether they want to play the game again or you can allow them to play repeatedly. Users should be able to exit the game whenever they want.

A screenshot of a computer program

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