Central Washington University
College of the Sciences
Department of Computer Science

CS-301 Data Structures   Fall 2016

Lab Practice 05

In this lab, we are going to explore simple recursive programming, including binary search
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```
lb05.pdf
BinSearch.java
GCDDemo.java
```

Normally you, will find the source and data files in `/home/cs-301/Labs/Lab05`

1. Write a client to test *BinSearch.java* program. You may hardcode the input, or read from a file.

2. Perhaps one of the most important algorithms ever, the greatest common divisor can be implemented recursively.

$$gcd(m, n) = \begin{cases} m, & n = 0 \ ; \\ gcd(n, m \bmod n) & n \geq 1 \ ; \end{cases}$$

   Such function is implemented in `GCDDemo.java`. Modify the input of the program, so that it computes the gcd of any number of values. **a.** Use your program to compute the gcd of :

$$288392, 97583, 2789928$$

   b. Can you include *proviso* in your program to prevent a user to enter values once a certan condition occurs?.

3. Write an implementation of and `ArrayList<Integer>` version of recursive metod *Bin-Search.java*

4. Write a recursive method that computes a maximum value of an array of integers. Start by defining (recursively) what that value should be.

5. Write a recursive method,

   ```
   static void reverse( StringBuffer x )
   ```

   that prints `x` but in reverse. A `StringBuffer` object, is like a string but its value can be changed. See the API.