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University of Puerto Rico
Department of Electrical and Computer Engineering
ICOM 4036: Programming Languages
Fall 2005

Problem Set #1 (DUE Sept 15 In class)

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1. Provide the state diagram for a Turing Machine recognizing the set of strings $a^n b^n c^n$ of equal number of a's, b's and c's, in that order.

2. Can you build a Turing Machine capable of determining if an input Turing Machine accepts the string "foo"? Why or why not? Argue convincingly.

3. PLP[1] 2.5

4. PLP 2.14. Provide the grammar accepting comments as tokens

5. Write versions of the following factorial function in four languages of your choice other than C and C++.

```
int factorial (int n) {
    if (n <= 0)
      return 1;
    else
      return (n * factorial(n – 1));
}
```

You must test your code to make sure it works and submit output generated by the translator and your program. You must include at least one version written in another high level language and one version written in a scripting language. Try to be original and use the computing lab (S-121/122) and the web as resources for interpreters and compilers.

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PLEASE WORK INDIVIDUALLY ON THIS PROBLEM SET

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[1] PLP = Programming Language Pragmatics Textbook by Scott