Programming Languages: Homework 1

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Note: *You are required to include a printout of a session showing a run of your program on some general testdata.*

Problem 1. [Problems 1.3 (pp. 21), 2.8 (pp. 60), 2.9 (pp. 60) in Sethi: Programming Languages—Concepts and Constructs.]

Problem 2. *What do following* `C` *expressions evaluate to?*

1. `a---b`

2. `a+++++b`

3.
```
if (x[i] > big);
  big = x[i];
```

4.
```
if (n<3)
  return
my.date = x[0];
my.time = x[1];
my.place = x[2];
```

5.
```
while (c =getc(in) != EOF)
  putc(c,out);
```

The intention is to copy a file of characters from `in` *to a new file* `out`*. Hint: Instead the file* `out` *will contain a string of bytes, each of binary value 1.*

Problem 3. *A simple string-searching program.*

(a) Here are a PASCAL type declaration and function header:

```
type string10 = array[1..10] of char;
function index(s: string10; c: char): integer;
```

The function `index` *is supposed to search the string* `s` *for the leftmost occurrence of the character* `c`*. If* `c` *is found the index of the leftmost occurrence is returned; otherwise* `0` *is returned. Examples:*

```
index(´Hello, Bud´, ´l´)
   returns 3
index(´Hi, Thomas´, ´l´)
   returns 0
```

Write the entire definition of the function index in PASCAL.

(b) Why is not the call `index(´Huh?´, ´u´)` *legal?*

(c) Write a version of `index` *that can effectively take a string of any length and search it for a character. Invent a valid PASCAL data type* `VaryingString` *and use it as the first argument of a new version of the function* `index`*. Address the question (b) for your new function.*