

CSc 451, Spring 2003
Assignment 3
Due: Thursday, February 6 at 18:00

Problem 1. (2 points each) `gens.txt`

Write expressions that have the following result sequences. You may not use any procedures.

- (a) The integers. The order is unimportant but every integer should eventually occur.
Restriction: You may not use `to-by` or `seq()`.
- (b) The sequence {"a", "bb", "ccc", ..., "z...z"}. Note that `&lcase` provides the lower-case letters. (It is a character set, but you can use it as a string.)
- (c) All non-null substrings of a string `s`, in order by length. For example, if `s` is "abcd", the result sequence would be {"a", "b", "c", "d", "ab", "bc", "cd", "abc", "bcd", "abcd"}.
- (d) All rotations of a string `s`. For example, if `s` is "rotate", the result sequence would be {"rotate", "otater", "tatero", "aterot", "terota", "erotat"}
- (e) The minutes of the day: {"12:00am", "12:01am", ..., "11:59pm"}; 1440 results in all.
- (f) The characters in `s1` that are not in `s2`. For example, if `s1` is "butterball" and `s2` is "biscuit", the result sequence is {"e", "r", "a", "l", "l"}. The results should be in the order they appear in `s1`.

Submit your answer as a text file. For example, if the problems were

- (a) The integers from 1 to 10
- (b) The characters in string `s`

then `gens.txt` should look something like this:

- (a) 1 to 10
- (b) !s

Problem 2. (3 points) `genprev.icn`

Write an Icon procedure `genprev(x)` that generates the values of the arguments that it has previously been called with.

Example:

```
][ .inc genprev.icn
][ .every genprev(10);
][ .every genprev("abc");
   10 (integer)
][ every genprev(!"abc");
Failure
][ .every genprev([]);
   10 (integer)
   "abc" (string)
   "a" (string)
   "b" (string)
   "c" (string)

][ .every genprev();
   10 (integer)
   "abc" (string)
   "a" (string)
   "b" (string)
   "c" (string)
L1:[] (list)
```

Another invocation would show `&null` as the last result.

A reference version of `genprev` (a pair of ucode files) is in `/home/cs451/a3`.

DO NOT include a main procedure in `genprev.icn`.

Miscellaneous

You are specifically prohibited from directly copying any code, except that presented in class or otherwise provided by me. However, you may study discovered code, such as that found in a textbook—not the code of a classmate—to the point of understanding how it works and then with that knowledge, write your own version.

No comments or explanation any sort need be included with your solutions.

Deliverables

Use `turnin` with the tag `451_3` to submit your solutions for grading. The deliverables for this assignment are the files `gens.txt` and `genprev.icn`.