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DEPARTMENT OF COMPUTER SCIENCE

Icon Newsletter #9

Ralph E. Griswold

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Version 2 Implementation Information

Version 2 of the portable (Ratfor) Icon system has been implemented for the HP 3000/III and is available to interested persons. Contact

John R. Sorenson, Director
Academic Computer Center
Valparaiso University
Valparaiso, Indiana   46383

North Carolina State University no longer distributes their Version 2 implementations for the IBM 370 and VAX/VMS. We will provide copies of their distribution tapes and documentation on request (see the form at the end of this Newsletter). This is being done as a service to potential users. We can make no guarantees about these implementations nor can we help with problems that may arise.

Version 5 Implementation Information

We are currently distributing Version 5 of the C implementation of Icon for the PDP-11 under UNIX. The current correction level is 5.4. Anyone who has a earlier correction level, but who has not received the corrections should write to us. Anyone who prefers to get a new distribution tape with the corrections already made may do so as described in Newsletter #8.

We are presently completing an implementation of Version 5 for the VAX under UNIX. Availability of this implementation will be announced in the next Newsletter — hopefully some time this fall.

Version 5 for the Onyx C8002 is available from

John D. Polstra
11522 NE 20th Street
Bellevue, Washington   98004

Transporting the C Implementation of Icon

Several persons have expressed an interest in transporting the C implementation of Icon to different computers, including the CRAY-1, DG MV8000, HP 3000, Motorola 68000, and PRIME 450/550.

Transporting the C implementation of Icon should be an interesting if difficult project. Portability was not a primary consideration in the design of the implementation and there are machine dependencies in the code as well as some assembly language routines. Nevertheless, transporting the C implementation of Icon is feasible as evidenced by the Onyx and VAX implementations.

We presently are working on making the system more portable and on providing better documentation. Persons who are interested in transporting the C implementation of Icon should write to us about the current status of this project.

1. The Icon Book

The Icon book mentioned in Newsletter #8 has evolved into a larger project than originally planned. It is now near completion and is scheduled for delivery to the publisher, Prentice-Hall, Inc., at the end of September. Publication sometime in 1983 is likely.

The description of Icon is divided into two parts, one that covers the basic features and another that covers advanced topics such as generators and string scanning. There are also sections on programming techniques and large sample programs.

The book describes Version 5 of Icon. A technical report describing the differences between Versions 5 and 2 will be prepared for persons who are using Version 2.

Research Related to Icon

We are currently involved in several areas of research that are related to Icon.

One area concerns control operations. Since the evaluation of an expression in Icon may produce a sequence of results, Icon offers many interesting possibilities for control operations that would be meaningless in most programming languages. Examples are the alternation, repeated alternation, and limitation control structures.

We have investigated adding programmer-defined control operations to Icon in much the same way that procedures provide a way to extend the repertoire of built-in functions. A technical report describing this work is available. See the document request form at the end of this Newsletter.

A second area of research concerns the unification of string and list processing. While the low-level facilities of Icon for string and list processing are similar in many respects, there is no list-processing analogy for string scanning.

Interestingly, string scanning may produce a list. An example is

```
a := []
s ? while put(a, move(1))
```

which creates a list of the one-character strings of s.

We are starting by generalizing the low-level string analysis operations of Icon to include lists and will proceed toward scanning in which the subject may be either a string or a list.

Icon Documents

In addition to the technical report on programmer-defined control operations mentioned above, several new documents on Icon are available. These include Steve Wampler's dissertation in technical report form and a self-contained report on co-expressions. There is also a list of corrections to the Version 5 reference manual. For those persons interested in program portability, there is a reprint of a paper that describes a tool to aid in the installation of software. This tool was used experimentally for Version 2 of Icon.

We frequently get requests for older Icon documentation, including requests for back issues of this Newsletter. All Icon documents are available on request with the exception of Newsletter #1, which had no technical content. We will supply copies of documents on request as long as supplies last. Persons who are receiving the Icon Newsletter for the first time with this issue may wish to request back issues of the Newsletter; they contain lists of other documents.

Anyone who is interested in receiving this Newsletter is welcome to do so; write and ask to be placed on the Icon mailing list.

Programming Corner

The programming corner is short this time (most of our available energy in this area is going toward the Icon book). The following shuffling procedure, contributed by Ward Cunningham of Tektronix Computer Research Laboratory, deserves publication, however:

```
procedure shuffle(x)
    every !x :=: ?x
    return x
end
```

Note that this is not the standard algorithm for shuffling as given, for example, by Knuth. Comments on the 'effectiveness' of the procedure above are welcome.

Observe that x may be a string, list, table, or record. *Question:* why does this procedure not work for csets?

Request for Icon Documents

Please send the documents checked below to:

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☐   *Control Mechanisms for Generators in Icon*, TR 81-18

☐   *Co-Expressions in Icon*, TR 82-4

☐   *Programmer-Defined Control Operations in Icon*, TR 82-8

☐   *Corrigenda for the Icon Version 5 Reference Manual (TR 81-4a)*

☐   A Tool to Aid in the Installation of Complex Software Systems, reprinted from *Software — Practice & Experience*

Return this form to:

       Ralph E. Griswold
       Department of Computer Science
       University Computer Center
       The University of Arizona
       Tucson, Arizona   85721
       USA

Request for Version 2 Icon for the IBM 360/370 and VAX

Note: These systems were implemented at North Carolina State University. Copies are provided without any guarantees or promises of assistance if there should be problems.

Please send the systems checked below:

☐   IBM 360/370 OS Icon Version 2

☐   VAX/VMS Icon Version 2

Contact Information:

name: _____

address: _____

    _____

    _____

    _____

telephone: _____

cable/telex: _____

Magnetic Tape Information: All magnetic tapes are written in 9-track format. The IBM system is on a standard-labeled OS tape. The VAX system is on a labeled VMS tape in copy format.

Please specify your preferred tape recording density:

☐ 1600 bpi   ☐ 800 bpi

Return this form to:

        Ralph E. Griswold
        Department of Computer Science
        University Computer Center
        The University of Arizona
        Tucson, Arizona   85721
        USA

Enclose a magnetic tape (at least 1200') or a check for $15.00 payable to the University of Arizona (2 tapes or $30 if both systems are requested).