Letters to the Editor

Phase-Structure Productions in PL/I

EDITOR:

The recent article on syntax generation by Larry Irwin, "Implementing Phrase-Structure Productions in PL/I" [*Comm. ACM 7*, 10 (July, 1967), 424], presented a neat method for randomly generating a terminal string of a BNF language. The following problem occurs when this is implemented for a language with recursive productions. The generator may loop through the recursive productions and with nonzero probability not terminate.

The problem of termination is equivalent to the problem of ruin in generalized random walks [Feller, *Probability Theory and Its Applications*]. Consider the grammar in example (1a), where each of the three productions may be chosen with equal probability. Generation starts with an initial S producing either a string with two S's (probability $2/3$) or terminating with the string a (probability $1/3$). If S's exist, the generator selects the first S and again chooses at random a production. This is the same as the random walk problem with a particle at the origin stepping 1 to the right with $2/3$ probability or 1 to the left with $1/3$ probability. If the particle reaches -1 at any time it stops. Its probability of stopping is just $1/2$, and this is also the probability of a random string generator terminating on example (1a). Generation in some recursive grammars will stop with probability 1. Example (1b) is a grammar which will stop within n steps with probability $1-1/2^n$ ($\lim n \to \infty\ 1-1/2^n \to 1$).

Now BNF descriptions of programming languages exhibit many levels of recursion, and Irwin's simple scheme of mapping the BNF into generative routines will not work. The probability that the generation of an ALGOL ⟨program⟩ will terminate, using this scheme, is very small. Therefore in generative methods the selection of productions must be weighted to increase the probability of generating terminal strings. If in example (1a), the first production is given two chances of being chosen [see example (1c)], then the probability of terminating is 1.

Examples of recursive grammars

(1a) $S \to a \mid SaS \mid SbS$
(1b) $S \to a \mid aS$
(1c) $S \to a \mid SaS \mid SbS \mid a$

IRA POHL
Stanford Linear Accelerator Center
Stanford, California

In Memory of Richard Goodman

EDITOR:

Richard H. Goodman, Head of the Department of Computing, Cybernetics and Management in Brighton College of Technology, died on August 16, 1966. His pioneer work in computing science, educational technology and related fields earned for him an international reputation, and a number of his friends and professional associates have expressed the wish that his memory should be perpetuated in some appropriate way.

Feeling confident that many others will wish to support such a project, we have formed the Richard Goodman Memorial Committee to sponsor an appeal for funds. The object, at least in the first instance, is to endow a Richard Goodman Memorial Lecture to be delivered annually in this College, which he served so well. An eminent person will be invited to give the Lecture on a topic reflecting Richard Goodman's wide range of interests. It is, however, out intention that the Trustees, when appointed, shall be enabled at their discretion to devote part or all of the income from the fund to any other relevant educational purpose. This we believe would have been in accordance with the wishes of our late friend and colleague.

Donations should be sent to Mr. J. Quinn, Brighton College of Technology, Moulsecoomb, Brighton 7, cheques being made payable to "Richard Goodman Memorial Fund."

All donations will be individually acknowledged, and donors will be informed in due course of the progress of our enterprise.

G. E. WATTS, *Chairman*
R. G. M. Appeal Committee

Use Chinese for Zero and Oh?

EDITOR:

The standards described in R. W. Bemer's paper, "Toward Standards for Handwritten Zero and Oh" [*Comm. ACM 10*, 8 (August, 1967), 513], all seem logical indeed. However, to distinguish between the two, it seems that the Chinese have the best solution.

Zero　零

Oh　奧

(Mrs.) P. P. Lo
The Western Pacific Railroad Co.
San Francisco, California

Re Family Membership in ACM

EDITOR:

The purpose of this letter is to explain the concept of *family membership* to the members of ACM.

Among the over 21,000 members of the ACM there must be several hundred who, like me, are married to someone who would like to be, or is now an ACM member. However, with the $25 membership fee it becomes expensive for both members of a family to be ACM members, and often the duplication of journals is unnecessary.

To allow spouses to be ACM members but not receive the publications, I (and several other ACM members) would like to have ACM establish *family memberships* similar to the family membership plan of the Mathematical Association of America. Then both husband and wife could become members of ACM and enjoy all the privileges of membership; the second member would pay only a nominal fee (say $3) and would not receive the publications (*JACM*, *CACM*, and *Computing Reviews*).

In order for the members of ACM Council to enact family membership they need to know that it will benefit a substantial portion of the membership. Therefore I am asking all interested parties to contact me and I will then compile a list which the Council can use in making its decision.

Please do write to me. A postcard will suffice!

LYLE B. SMITH
Computer Science Department
Stanford University
Stanford, California 94305