SAMMET

PROGRAMMING LANGUAGES:
History and Fundamentals

Prentice-Hall

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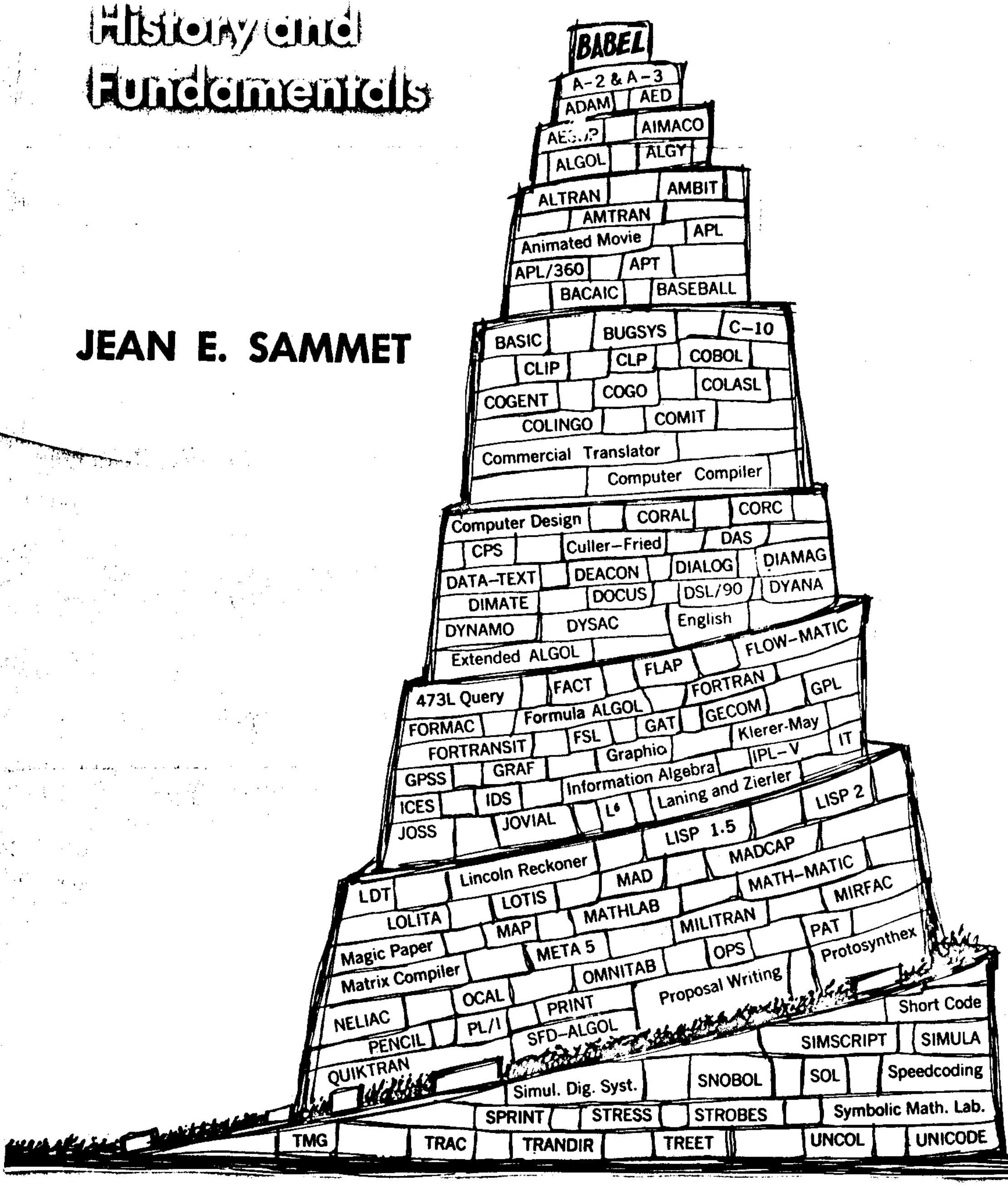

PRENTICE-HALL SERIES IN AUTOMATIC COMPUTATION

SAMPLE PROGRAM—JOVIAL

Problem: Construct a subroutine with parameters A and B such that A and B are integers and $2 < A < B$. For every odd integer K with $A \leqslant K \leqslant B$, compute $f(K) = (3K + \sin(K))^{\frac{1}{2}}$ if K is a prime, and $f(K) = (4K + \cos(K))^{\frac{1}{2}}$ if K is not a prime. For each K, print K, the value of $f(K)$, and the word PRIME or NONPRIME as the case may be.

Assume there exists a subroutine or function PRIME (K) which determines whether or not K is a prime, and assume that library routines for square root, sine and cosine are available. This program also assumes the existence of three output routines. [Note: JOVIAL has ODD as a primitive.]

Program:

```
PROC      SPEC (A1, B1)$  ITEM A1 I U 47 $
                          ITEM B1 I U 47 $
BEGIN     WRITE (0) $
          IF NOT ODD (A1)$
          A1 = A1 + 1$
          FOR K = A1, 2, B1$
  BEGIN       WRITEN (15, K, 0)$
    IFEITH    PRIME (K) $
   BEGIN  WRITEN (30, SQR, (3*K + SIN (K)), 5)$
          WRITEH (45, 5H(PRIME))$
   END    ORIF 1 $
   BEGIN  WRITEN (30, SQR (4*K + COS (K)), 5) $
          WRITEH (45, 8H(NONPRIME))$
   END
  END     WRITE (1) $
END       WRITE (4) $
END
```

The language serves simultaneously as a reference, publication, and hardware language. JOVIAL was designed for the professional programmer and definitely to be used in a batch environment. However, a much later and much simpler version called JTS (see Sandin and Foote [SN65]) was installed under SDC's time-sharing system, and an interpretive extended subset version called TINT was specifically designed and implemented for on-line use. (See Kennedy [KE 65].)

JOVIAL has had the misfortune to suffer throughout its history from all the problems that could possibly arise from an attempt to have wide usage, maintain compiler independence, avoid dialects, and control subsetting and extensions. The proliferation of documents and systems on differing machines did not help the situation, although there were continuous attempts in SDC to control this problem. The earliest description seems to be the one by Schwartz, Petersen, and Olson [SC60]. The reader interested in pursuing which versions existed on which machines should see the papers by Shaw [SH63b] and Steel [ST66], but even these are not complete. (See also Figure

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Other references are listed at

[4] Shaw [SH00].

[5] Shaw [SH63b], p. 90.

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e Question of One or Several Lan-
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bining ALGOL and COBOL", *Proc.*
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