SETL NEWLETTER 74

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SETL 1. Project plan for first stage of Implementation.

0. The following document sets forth certain points of view concerning the implementation of SETL developed by its authors.

0.1. In the present text the word 'SETL' signifies not the algorithmic language SETL of references ([1],[2]), but the idea of constructing a set theoretic programming language. This terminology reflects not only an attempt to broaden our discussion and make it somewhat independent, but also reflects the present state our own discussion of underlying questions.) Accordingly, we take the implementation of SETL to include the following

A) The elaboration of an algorithmic language;

B) The construction of an interpretive system.

0.2. The authors presume that the central result of an effort of SETL implementation must be either to demonstrate that it is possible to build an efficient system, or at any rate to specify restrictions which make an efficient system attainable.

0.3. Our program of work during the first stage of implementation will consist of the following.

0.3.1 The definition of a preliminary language variant (choice of external representation, style, control-structure operation combinations, etc.) Through experimentation with programs in different dialects of a hypothetical language (for example, SETL).

0.3.2. We take the central problem to be solved in studying set-theoretic programming languages as that of determining their "efficiency spectrum" in dependence on possible fields of application; in particular, we will wish to construct examples in which such languages performs poorly.

0.3.3. The specification of an experimental processor

0.3.4. Theoretical investigation of the optimisation of such a Processor.

0.3.5. Metaprogramming questions: mathematics, set theory, programming languages.

0.4. The specific efforts which we propose to carry through can be placed tentatively under three headings:

1) Examples (the writing of various programs, their analysis, and so forth)

11) Theory

111) Experiment (whatever experimentation a preliminary implementation makes possible)

The connection between these various lines of work is described on an attached chart.

0.5. In our opinion, the first stage of implementation must be characterized by a broad study of problems connected in various ways with the SETL concept.

0.6. The implementation of SETL must take account of the results obrained by the NYU group. This can be achieved through a sympathetic but critical study of available materials, together with a maximum degree cooperation with the NYU SETL group.

1. Examples

1.0.1. As a preliminary task, each member of the SETL implementation group is requested to write several programs in a set-theoretic language (in the sense of 0.3.1.), keeping in mind the final goal of such 'unrestricted' language experiments.

1.0.2. We note the following tasks supplementary to that mentioned in 0.3.1: a) To specify a subset language as a fixed basis for subsequient elaboration

b) To construct, using LISP, an interpreter for such a subset language, thereby making available a functioning, though inefficient, SETL processor.

1.0.3. Below we enumerate various problems actively under condideration at the present time. Their small number shows that they cover the problem area to studied, but thinly. Their choice is dictated by the personal taste of the authors.