1. A Little Vocabulary

Communication with the computer involves the preparation of a program which contains, in a form understood by the computer, a set of instructions, data, questions, etc. This program is then either punched in a deck of cards which is mechanically ingested and electrically read by the computer or is typed on a special typewriter known as a Teletype. The computer replies on paper--usually repeating the instructions, data, questions, etc., and then giving its responses, the results of computation. Schematically, this is shown in Figure 1-1.

![Figure 1-1](image)

Although it has little to do with the operation of the computer from the user's viewpoint, there is a significant jargon about computing. Part of this is important to the beginner as it will help him communicate with other people about his computing problems. In this section many of the terms of this jargon are introduced and defined by the context in which they are found. It is suggested that the reader familiarize himself with these terms.

The data card, Figure 1-2, is ubiquitous. In addition to knowing that one should not be "folded, spindled or mutilated", some nomenclature of the data card is useful. Referring to Figure 1-2, we see that the card contains 80 columns of the digits 0 through 9. We also refer to the zero row, the nine row, etc. Though there is no printed indication of it, computer scientists also distinguish, and use, two other rows - the eleven row, the one above the zero row and the twelve row at the top. Figure 1-2 reveals punches in both these rows. The

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1In this section we shall be concerned primarily with card input. Teletype input varies considerably from installation to installation. Instruction for whatever type of input is to be used will be available from the Computer Center. Teletypes are also known as terminals.
bottom of the card is commonly called the **nine edge** and the top is called the **twelve edge**. The printed side of the card is called the **face**. None of this printed material, including that typed by the key-punch at the top of the card, is of any consequence to the computer. It reads only the holes.

![Card diagram](image)

Figure 1-2

We have already indicated that the computer reads cards. It does this by sensing, electrically, the presence of a hole in a particular location\(^1\). The computer is built to respond to the stimuli thus received in somewhat the same way that an electronic amplifier responds to the electrical stimuli generated in a microphone. Unfortunately, we cannot yet communicate with a computer orally. Hence, we must agree on the way the computer is to respond to certain collections of holes in a card. (Actually, the user rarely participates in these agreements. They are made by the manufacturer with the aim of pleasing as many people as possible.) These agreements result in what is called a **machine language**. This is a coded collection of holes which stimulate the computer to perform those mechanical and electrical operations which correspond, under the code, to arithmetic operations. Machine languages are usually simple, but since only the arithmetic operations are allowed, they are extremely

\(^1\)In Teletype operation, this electrical indication is generated by the typewriter.