ReadDec – Decimal ASCII digits to Binary Conversion

Instead of making X and Y variables hardcoded, we want to make the program flexible by letting a user type in the variables from the keyboard. We will assume the numbers are decimal. Since the number is typed as ASCII digits it has to be converted to decimal and eventually converted to binary. There are a number of algorithms we can use for this but let us look at one with an example. Suppose we want to convert the ASCII string 4096. Let us assume AX will be used keep track of the binary value. AX is initialized to zero. As each ASCII digit is read, we multiply AX by 10 and the digit’s binary value is added to AX. After all digits have been read, AX contains the binary value of the number 4096. Note that the most significant digit is typed first. The following table describes the algorithm.

|  |  |  |
| --- | --- | --- |
| AX (before) | New Digit | AX (after) |
| 0 \*10 + | 4 | = 4 |
| 4\*10 + | 0 | = 40 |
| 40\*10 + | 9 | = 409 |
| 409\*10 + | 6 | = 4096 |

Why does this work?