



UNIT-2

CLASSIFICATION OF INSTRUCTIONS AND I/O PORT PROGRAMMING



BCD and ASCII Conversion





Introduction

- Binary Coded Decimal (BCD) and American Standard Code for Information Interchange (ASCII) are two important methods used for converting data in computer programming. BCD is a numerical code used to represent decimal numbers in a binary form, while ASCII is a character encoding standard used to represent characters in digital form.
- Both BCD and ASCII conversion are widely used in a variety of applications, ranging from telecommunications to computing to finance. Understanding how to convert data using these methods is crucial for anyone involved in computer programming or data analysis.





Binary Coded Decimal (BCD) Conversion

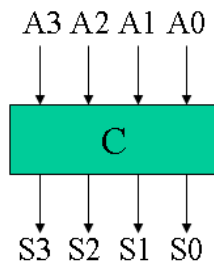


- Binary Coded Decimal (BCD) is a method of representing decimal numbers in binary form. In BCD, each decimal digit is represented by a four-bit binary code. For example, the decimal number 35 is represented in BCD as 0011 0101.
- BCD conversion is an important operation in computer programming, particularly in applications that involve financial calculations, where precision and accuracy are critical. The BCD format allows for easy arithmetic operations, as each digit can be operated on separately.
- To convert a decimal number to BCD, the following algorithm can be used:
 - Divide the decimal number by 10.
 - Record the remainder as a BCD digit.
 - Repeat steps 1-2 with the quotient until the quotient is zero.



BCD Conversion Algorithm

1. Divide the decimal number by 10.
2. Record the remainder as a BCD digit.
3. Repeat steps 1-2 with the quotient until the quotient is zero.



A3	A2	A1	A0	S3	S2	S1	S0
0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	1
0	0	1	0	0	0	1	0
0	0	1	1	0	0	1	1
0	1	0	0	0	1	0	0
0	1	0	1	1	0	0	0
0	1	1	0	1	0	0	1
0	1	1	1	1	0	1	0
1	0	0	0	1	0	1	1
1	0	0	1	1	1	0	0
1	0	1	0	X	X	X	X
1	0	1	1	X	X	X	X
1	1	0	0	X	X	X	X
1	1	0	1	X	X	X	X
1	1	1	0	X	X	X	X
1	1	1	1	X	X	X	X





ASCII Conversion

- The American Standard Code for Information Interchange (ASCII) is a character encoding standard used to represent characters in digital form. In ASCII, each character is represented by a unique seven-bit code, which allows for 128 possible characters to be represented.
- ASCII conversion is an important operation in computer programming, particularly in applications that involve text processing or communication. Understanding how to convert characters to ASCII code and vice versa is crucial for anyone involved in computer programming or data analysis.





Differences between BCD and ASCII Conversion



- BCD and ASCII conversion are two common operations in computer programming used to represent numerical and character data in digital form. While they share some similarities, there are also several key differences between BCD and ASCII conversion.
- Binary Coded Decimal (BCD) is a system used to represent numerical data in digital form. In BCD, each decimal digit is represented by a unique four-bit code, allowing for efficient storage and manipulation of numerical data. BCD conversion involves converting a decimal number into its corresponding BCD representation.
- On the other hand, ASCII is a character encoding standard used to represent characters in digital form. In ASCII, each character is represented by a unique seven-bit code, allowing for efficient storage and manipulation of character data. ASCII conversion involves converting a character into its corresponding ASCII code, or vice versa.





Applications of BCD and ASCII Conversion

- BCD and ASCII conversion are important operations in computer programming with a wide range of applications. Understanding how to perform these conversions accurately and efficiently is crucial for anyone involved in programming or data analysis.
- One common application of BCD conversion is in financial applications, such as banking and accounting systems. These systems often deal with monetary values that require high precision and accuracy, making BCD an ideal format for storage and manipulation of numerical data.
- Another application of BCD conversion is in embedded systems, such as microcontrollers and other low-level hardware devices. BCD is often used in these systems because it requires less computational resources compared to other numerical formats, making it ideal for resource-constrained environments.





Thank
you

