# Binary to MIDI Conversion Algorithm

1 Overview

The algorithm converts arbitrary binary data into MIDI music by interpreting bytes as musical parameters. The process involves splitting bytes into 4-bit nibbles and mapping these values to MIDI parameters.

2 Algorithm Steps

2.1 1. Data Chunking

The binary file is read in chunks, where each byte is split into two 4-bit nibbles.

Original Byte	
Upper	Lower
0000	0000
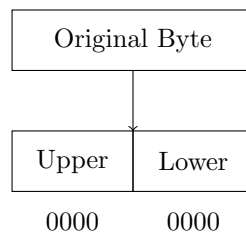
2.2 2. MIDI Message Construction

Each group of 8 nibbles is used to construct a MIDI message. The nibbles are allocated as follows:

- Nibble 1: Channel number

- Nibbles 2-3: Note number

- Nibbles 4-5: Velocity

- Nibbles 6-7: Note-on timing

- Nibble 8: Note length

Ch	Note	Note	Vel	Vel	Time	Time	Len

2.3 3. Timing Calculation

The timing information is calculated using two components:

- Note-on time: Derived from two nibbles

- Note length: Mapped from one nibble to musical durations

2.4   4. MIDI File Creation

The algorithm creates two MIDI messages for each chunk:

- Note-on message: Initiates the note

- Note-off message: Terminates the note after the calculated duration

3   Bit Manipulation

The algorithm uses a custom Int4 class to handle 4-bit integers.