1. **Source Code of the Music Synthesis**

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#CPE 4 **-** 2

#Jingle Bells**,** Music Synthesis

#2022**-**12**-**18

clc**;**

clf**;**

clear all**;**

close all**;**

fs **=** 44100**;**

# Time Stamp

te**=**0**:(**1**/**fs**):**0.25**;**

tq**=**0**:(**1**/**fs**):**0.5**;**

ttq**=**0**:(**1**/**fs**):**0.75**;**

th**=**0**:(**1**/**fs**):**1.0**;**

tth**=**0**:(**1**/**fs**):**1.5**;**

tw**=**0**:(**1**/**fs**):**2.0**;**

# Alphabet **|** Octave **|** Note

#4th Octave

#Quarter Notes

D4Q**=**sin**(**2**\***pi**\***294**\***te**);**

B4Q**=**sin**(**2**\***pi**\***494**\***te**);** #0.25

A4Q**=**sin**(**2**\***pi**\***440**\***te**);**

G4Q**=**sin**(**2**\***pi**\***392**\***te**);**

E4Q**=**sin**(**2**\***pi**\***330**\***te**);**

G4Q2**=**sin**(**2**\***pi**\***392**\***tq**)**

B4Q2**=**sin**(**2**\***pi**\***494**\***tq**);** #0.50

A4Q2**=**sin**(**2**\***pi**\***440**\***tq**);**

#Half Notes

D4H**=**sin**(**2**\***pi**\***294**\***th**);**

E4H**=**sin**(**2**\***pi**\***330**\***th**);**

F4H**=**sin**(**2**\***pi**\***349**\***th**);**

B4H**=**sin**(**2**\***pi**\***494**\***th**);**

G4H**=**sin**(**2**\***pi**\***392**\***th**);**

#5th Octave

#Quarter Notes

C5Q**=**sin**(**2**\***pi**\***524**\***te**);**

D5Q**=**sin**(**2**\***pi**\***587**\***te**);**

E5Q**=**sin**(**2**\***pi**\***659**\***te**);**

D5Q2**=**sin**(**2**\***pi**\***587**\***tq**);**

#Scores

scoreA**=[**D4Q**,**B4Q**,**A4Q**,**G4Q**,**D4H**];**

scoreB**=[**D4Q**,**B4Q**,**A4Q**,**G4Q**,**E4H**];**

scoreC**=[**E4Q**,**C5Q**,**B4Q**,**A4Q**,**F4H**];**

scoreD**=[**D5Q**,**D5Q**,**C5Q**,**A4Q**,**B4H**];**

scoreE**=[**E4Q**,**C5Q**,**B4Q**,**A4Q**,**D5Q**,**D5Q**,**D5Q**,**D5Q**];**

scoreF**=[**E5Q**,**D5Q**,**C5Q**,**A4Q**,**G4Q2**,**D5Q2**];**

scoreG**=[**B4Q**,**B4Q**,**B4Q2**,**B4Q**,**B4Q**,**B4Q2**];**

scoreH**=[**B4Q**,**D5Q**,**G4Q**,**A4Q**,**B4H**];**

scoreI**=[**C5Q**,**C5Q**,**C5Q**,**C5Q**,**C5Q**,**B4Q**,**B4Q**,**B4Q**];**

scoreJ**=[**B4Q**,**A4Q**,**A4Q**,**B4Q**,**A4Q2**,**D5Q2**];**

scoreK**=[**D5Q**,**D5Q**,**C5Q**,**A4Q**,**G4H**];**

#Lines

lineA**=[**scoreA**,**scoreB**,**scoreC**,**scoreD**,**scoreA**,**scoreB**,**scoreE**,**scoreF**];**

lineB**=[**scoreG**,**scoreH**,**scoreI**,**scoreJ**,**scoreG**,**scoreH**,**scoreI**,**scoreK**];**

lineC**=[**scoreG**,**scoreH**,**scoreI**,**scoreJ**,**scoreG**,**scoreH**,**scoreI**,**scoreK**,**scoreI**,**scoreK**];**

#Full Song

fullsong**=[**lineA**,**lineB**,**lineA**,**lineC**];**

#Run

soundsc**(**fullsong**,**fs**);**

1. **Formulas**

fs = 44100;

# Time Stamp

te=0:(1/fs):0.25;

tq=0:(1/fs):0.5;

ttq=0:(1/fs):0.75;

th=0:(1/fs):1.0;

tth=0:(1/fs):1.5;

tw=0:(1/fs):2.0;

# Alphabet | Octave | Note

#4th Octave

#Quarter Notes

D4Q=sin(2\*pi\*294\*te);

B4Q=sin(2\*pi\*494\*te); #0.25

A4Q=sin(2\*pi\*440\*te);

G4Q=sin(2\*pi\*392\*te);

E4Q=sin(2\*pi\*330\*te);

G4Q2=sin(2\*pi\*392\*tq)

B4Q2=sin(2\*pi\*494\*tq); #0.50

A4Q2=sin(2\*pi\*440\*tq);

#Half Notes

D4H=sin(2\*pi\*294\*th);

E4H=sin(2\*pi\*330\*th);

F4H=sin(2\*pi\*349\*th);

B4H=sin(2\*pi\*494\*th);

G4H=sin(2\*pi\*392\*th);

#5th Octave

#Quarter Notes

C5Q=sin(2\*pi\*524\*te);

D5Q=sin(2\*pi\*587\*te);

E5Q=sin(2\*pi\*659\*te);

D5Q2=sin(2\*pi\*587\*tq);

1. **Song Lyrics**

Dashing through the snow

In a one-horse open sleigh

O'er the fields we go

Laughing all the way

Bells on bobtails ring

Making spirits bright

What fun it is to ride and sing

A sleighing song tonight, oh!

Jingle bells, jingle bells

Jingle all the way

Oh, what fun it is to ride

In a one-horse open sleigh, hey!

Jingle bells, jingle bells

Jingle all the way

Oh what fun it is to ride

In a one-horse open sleigh

Now the ground is white

Go it while you're young

Take the girls tonight

Sing this sleighing song

Get a bobtailed bay

Two forty for his speed

And hitch him to an open sleigh

And you will take the lead

Oh, jingle bells, jingle bells

Jingle all the way

Oh, what fun it is to ride

In a one-horse open sleigh, hey!

Jingle bells, jingle bells

Jingle all the way

Oh, what fun it is to ride

In a one-horse open sleigh

Oh, what fun it is to ride

In one horse open sleigh!

1. **Description**

In essence, the "Jingle Bells" song tells the story of Santa Claus's Christmastime antics as he pulls his sleigh.

The lyrics to the song "Jingle Bells" were written in 1857 by English lyricist James Lord Pierpont as a song of thankfulness. We're as confused about how and why it was intended to be a Thanksgiving song as you are. However, as a Christmas song, the song developed into a cultural classic over time.

How, why, or when the song's title changed from its original "One Horse Open Sleigh" by James Lord Pierpont is part of its enigmatic past.

The original song performances from 1889 are thought to be extinct at this time. The Beatles, Boney M., The Carpenters, Ella Fitzgerald, The Lennon Sisters, Dean Martin, Dolly Parton, Smokey Robinson and the Miracles, Frank Sinatra, and a host of other artists have all performed the song on their albums.

1. **Others**
2. **Piano Notes**

