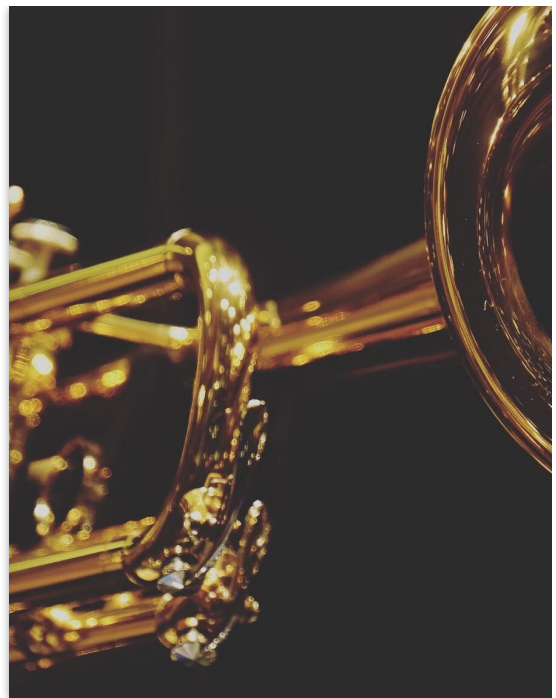


Music and Composition w/ChatGPT

Brian Pascente
Lifu Zhang


Background

- Brian Pascente: Plays trumpet in the concert band and used to play the piano
- Lifu Zhang: Plays the Euphonium and Trombone in band
 - Both familiar with Music/Composition






Incentive

- ChatGPT is great at generating things
 - ChatGPT-5 supposedly have a PhD Level of intelligence
 - With the rise of AI voice and music, we wanted to see how good ChatGPT is when it comes to music theory and composition
 - This will be split into 3 parts:
 - Text-based knowledge check
 - Image recognition
 - Image generation
- 

BASIC KNOWLEDGE TEST



Question	Answer	Comments																		
How much do you know about music theory and composition	Quite a lot — I can go as deep as you want. Here's a breakdown of what I can cover in music theory and composition	Great start																		
How do I know if a piece of music is in treble clef or base clef 	<ol style="list-style-type: none"> 1. Look at the clef symbol on the staff 2. Consider the instrument or voice type 3. Look at the note range 	The first two are great answers, but the third is not. Note ranges does not correlate to the clef. Clefs are just different ways to write the same note.																		
How would I convert a note in bass clef into the same note in treble clef	<p>🗺 Mapping example: Same pitches across clefs</p> <table> <thead> <tr> <th>Pitch</th><th>Bass Clef Position</th><th>Treble Clef Position</th></tr> </thead> <tbody> <tr> <td>C2</td><td>Two ledger lines below the staff</td><td>Four ledger lines below the staff</td></tr> <tr> <td>C3</td><td>Second space from bottom</td><td>Two ledger lines below the staff</td></tr> <tr> <td>C4 (Middle C)</td><td>One ledger line above</td><td>One ledger line below</td></tr> <tr> <td>C5</td><td>Two ledger lines above</td><td>Second space from top</td></tr> <tr> <td>C6</td><td>Four ledger lines above</td><td>Top line of staff</td></tr> </tbody> </table>	Pitch	Bass Clef Position	Treble Clef Position	C2	Two ledger lines below the staff	Four ledger lines below the staff	C3	Second space from bottom	Two ledger lines below the staff	C4 (Middle C)	One ledger line above	One ledger line below	C5	Two ledger lines above	Second space from top	C6	Four ledger lines above	Top line of staff	Of all the given examples, only C4 is correct. ChatGPT does not know the position of the notes within the lines, much less how to convert.
Pitch	Bass Clef Position	Treble Clef Position																		
C2	Two ledger lines below the staff	Four ledger lines below the staff																		
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C4 (Middle C)	One ledger line above	One ledger line below																		
C5	Two ledger lines above	Second space from top																		
C6	Four ledger lines above	Top line of staff																		

Question	Answer	Comments																												
Give me some common concert band instruments and their keys	<p>🎵 Concert Band Instrument Keys</p> <table><thead><tr><th>Instrument</th><th>Key</th><th>Written C sounds as...</th></tr></thead><tbody><tr><td>Flute</td><td>C</td><td>C</td></tr><tr><td>Oboe</td><td>C</td><td>C</td></tr><tr><td>Bassoon</td><td>C</td><td>C</td></tr></tbody></table>	Instrument	Key	Written C sounds as...	Flute	C	C	Oboe	C	C	Bassoon	C	C	The list continues for a bit, and everything is correct so far. Maybe Chat is better at key identification																
Instrument	Key	Written C sounds as...																												
Flute	C	C																												
Oboe	C	C																												
Bassoon	C	C																												
Write a table showing the concert pitch and what that pitch correlates to for Bb, Eb, and F instruments	<p>🎵 Concert Pitch → Written Pitch for Transposing Instruments</p> <table><thead><tr><th>Concert Pitch (sounds as)</th><th>Bb Instrument writes</th><th>Eb Instrument writes</th><th>F Instrument writes</th></tr></thead><tbody><tr><td>C</td><td>D</td><td>A</td><td>G</td></tr><tr><td>C# / Db</td><td>D# / Eb</td><td>A# / Bb</td><td>G# / Ab</td></tr><tr><td>D</td><td>E</td><td>B</td><td>A</td></tr><tr><td>D# / Eb</td><td>F</td><td>C</td><td>Bb</td></tr><tr><td>E</td><td>F#</td><td>C#</td><td>B</td></tr><tr><td>F</td><td>G</td><td>D</td><td>C</td></tr></tbody></table>	Concert Pitch (sounds as)	Bb Instrument writes	Eb Instrument writes	F Instrument writes	C	D	A	G	C# / Db	D# / Eb	A# / Bb	G# / Ab	D	E	B	A	D# / Eb	F	C	Bb	E	F#	C#	B	F	G	D	C	The table is correct, but it may have just scraped the information out of the internet. Let's see if it can actually put this to use in a practical way
Concert Pitch (sounds as)	Bb Instrument writes	Eb Instrument writes	F Instrument writes																											
C	D	A	G																											
C# / Db	D# / Eb	A# / Bb	G# / Ab																											
D	E	B	A																											
D# / Eb	F	C	Bb																											
E	F#	C#	B																											
F	G	D	C																											
if my key has 2 flats on a concert pitch, what would it look like for a Bb instrument?	<p>🎵 Step 1: Identify the concert key</p> <p>Two flats (Bb and Eb) in concert pitch = Bb major (or G minor).</p> <p>🎵 Step 2: Adjust for a Bb instrument</p> <p>A Bb instrument (like trumpet, clarinet, or tenor sax) sounds a whole step lower than written. So to make the same sounding pitch, they must play a whole step higher.</p> <p>🎵 Step 3: Transpose the key up a whole step</p> <ul style="list-style-type: none">Concert Bb major → up a whole step → C major <p>✅ C major has no sharps or flats.</p>	This is correct! Chat is able to transpose keys as well as instruments. After other testing it has shown to be able to do this for other keys as well.																												



Analysis

ChatGPT does not actually “know” any of this information. Things such as key transpose, where **you can easily find a transpose table online**

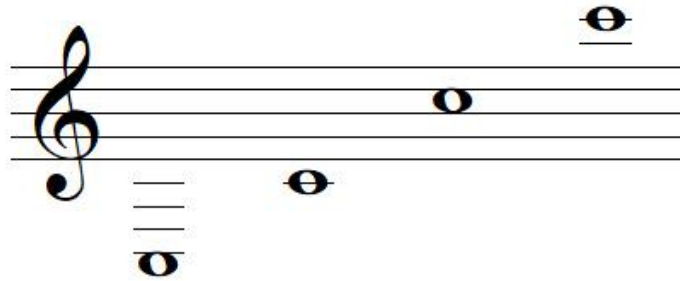
However, when it comes to “visualizing” the notes in terms of their positions, Chat struggles to find correct answers for it online. This is because **most online resources for note positions show them in pictures and not words.**

This is why, for our next experiment, we will test how good ChatGPT is at **reading** music.



IMAGE RECOGNITION

What note is
this on the
treble clef



Results

In the image, there are four notes on the **treble clef**:

- The **bottom note** (with two ledger lines below the staff) is C, known as **middle C (C4)**.
- The **next note up** (on the first ledger line below the staff) is E.
- The **note on the second line of the staff** is G.
- The **top note** (on the first ledger line above the staff) is A.

✅ So the notes, from bottom to top, are:

C – E – G – A



Correction

You're right to call me out — thanks. Sorry about the mistake. Here's a clear, honest explanation of why I labeled them C, E, G, A and where my reading went wrong.

What I did

When I read the image I used the usual visual rule:

- identify the five staff **lines** and four **spaces**,
- count **ledger lines** above/below the staff,
- place each note head on the nearest line/space and convert that position to a pitch name for the **treble clef**.

So, seeing four noteheads at different vertical positions I mapped them to (from bottom to top) what looked like:

- a note **below the staff** I read as a C (ledger lines below),
- a note **just below the staff** I read as E (first space or ledger placement),
- a note **on the second line** I read as G,
- a note **above the staff** I read as A (ledger line above).

Why that was wrong / what likely caused the error

1. **Visual ambiguity from the image** — the picture is low-resolution and cropped, so counting ledger lines and exact vertical alignment is easy to misread. A tiny shift in a notehead's vertical position changes its letter name.
2. I mis-counted ledger lines for at least one note (that changes which letter it is).
3. **Octaves can look similar** — multiple Cs in different octaves fall on different ledger lines/spaces (C3, C4, C5, etc.). If all the noteheads are actually aligned to C positions (different octaves), my initial quick read still could have been thrown off by scale and cropping.

Image of Hot Cross Buns

Right Hand only Traditional

Hot cross buns. Hot cross buns.

One a pen - ny, two a pen - ny

Hot cross buns.

Results

This sheet music is for the traditional nursery song “Hot Cross Buns.” 🎵

It’s written in **4/4 time** and uses only three notes — **E, D, and C** — making it one of the simplest beginner piano songs.

The lyrics match the melody shown:

Hot cross buns,
Hot cross buns,
One a penny, two a penny,
Hot cross buns.

It’s commonly taught to piano and recorder beginners because it helps practice stepwise motion (moving between adjacent notes).

Does it know
this song?

Gymnopédie No. 1
from *Trois Gymnopédies*
Erik Satie
Transcribed by Calista Avery

Lent et douloureux *con sordina*
pp

For a shorter performance, the piece may begin at measure 45.
Copyright © 2016 by HAL LEONARD LLC
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Results

This sheet music is “**Lent et douloureux**” (Slow and sorrowful), which is the first piece from Erik Satie’s *Trois Gymnopédies* — specifically *Gymnopédie No. 1*.

Details that identify it:

- The tempo marking “*Lent et douloureux*” (slow and painful)
- The indication *con sordino* (with mute)
- The characteristic repetitive left-hand chords in 3/4 time
- The right-hand melody with its distinctive contour and phrasing

This is one of Satie’s most famous piano works, composed in 1888.

How difficult is it to play this song?

Erik Satie’s *Gymnopédie No. 1* is generally considered **easy to intermediate** in difficulty — suitable for late beginner to early intermediate pianists.

Here’s a breakdown of what that means in practice:

🔧 Technical difficulty

- **Tempo:** *Lent et douloureux* (slow and sorrowful), so you don’t need great speed.
- **Left hand:** Plays steady, repeated chords (mostly simple triads and inversions). The challenge is keeping them even, soft, and consistent throughout.
- **Right hand:** Carries the gentle, lyrical melody. The intervals are not large, and the rhythms are simple, but the phrasing and timing require care.
- **Hand independence:** Moderate — you must balance the melody (right hand) clearly above the soft accompaniment (left hand).

📊 Difficulty level comparison

- **ABRSM / RCM level:** around **Grade 4–5**
- **Henle scale:** **Level 3** (Easy to Intermediate)
- **For self-taught pianists:** very approachable — a beautiful piece to work on tone, balance, and musicality.

🎵 Musical difficulty

- The real challenge is **expression**, not technique:
 - Achieving a **smooth legato** touch.
 - Maintaining **control at a very soft dynamic** (pp to p).
 - Conveying Satie’s **dreamy, melancholy atmosphere** with subtle rubato.
 - Keeping a consistent, flowing rhythm while letting the melody breathe.

Difficulty of
this song

Trumpet Solo
For Those Who Think Trumpet Is Too Easy
W.D.Y Think

$\text{♩} = 150$

3
6
9
12
15
18
21
24
27

Response:

✓ Summary

Aspect	Difficulty	
Key signature	Moderate (E major)	
Range	Intermediate to advanced	
Tempo	Fast (150 BPM)	
Articulation & accuracy	High precision required	
Overall skill level	Intermediate–Advanced (Grade 4–5)	

If you're comfortable with pieces like *Arban studies* or *Haydn's Trumpet Concerto (first movement excerpts)*, you'd be fine tackling this after some practice.

Annotations on the most difficult part

Trumpet Solo
For Those Who Think Trumpet Is Too Easy

W.D.Y. Think

Why do you think that parts are difficult? What makes these parts more challenging compared to the other measures?

1. Measures 10–11 (Fast scale run)

- **Why it's hard:** These measures feature a rapid, scalar passage with continuous sixteenth notes in E major. That means awkward fingerings like C#–D#–E–F#, which are less natural for trumpet valves.
- **Challenge:**
 - Clean fingering coordination at high tempo (150 BPM).
 - Maintaining consistent tone and airflow through the run.
 - Avoiding "valve lag" (uneven transitions between notes).

What to practice:

Slow practice with a metronome, tongue every other note to improve clarity, and gradually increase speed.





2. Measure 16 (Leap + syncopation)

- **Why it's hard:** There's a large interval jump followed by a rhythm that breaks the flow (a rest and off-beat entrance).
- **Challenge:**
 - Accurate pitch after a leap (requires good embouchure flexibility).
 - Timing precision on syncopated entries.
 - Rearticulating cleanly after a rest at high speed.

What to practice:

Play it in rhythm with a metronome emphasizing the downbeat, and isolate the leap to practice slurring smoothly between the two notes.

Part 3

3. Measure 25 (Arpeggio with direction change)

- **Why it's hard:** The line moves up and down quickly across the harmonic series, with finger direction changes that interrupt natural airflow.
- **Challenge:**
 - Maintaining airflow while changing direction.
 - Coordination between lip flexibility and valve motion.
 - Clean articulation in the middle register (often neglected in practice).

What to practice:

Play the passage slurred to focus on airflow first, then add articulation later.



My personal evaluation on the most difficult part



Annotation

The image shows a musical score with two staves, both in treble clef and key signature of one sharp (F#). The score is annotated with various performance instructions and technical markings. The left staff has a tempo marking of $\text{♩} = 150$ at the beginning. The right staff has a tempo marking of $\text{♩} = 120$ at the beginning. The score is divided into measures, with measure numbers 5, 10, 15, 20, 25, 30, 35, and 40 indicated. The annotations include:

- fast fingering**: A blue box highlights a sequence of notes in measure 10 of the right staff.
- interval jump**: A blue box highlights a sequence of notes in measure 15 of the right staff.
- direction change**: A blue box highlights a sequence of notes in measure 20 of the right staff.



Evaluation

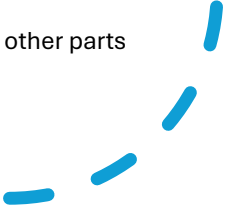
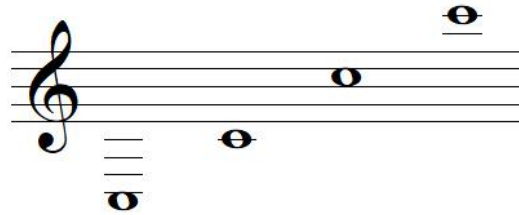
- If the piece is recognizable, it does a good job analyzing the piece
 - Recognize the piece -> searches online about information of that piece -> tells difficulty
 - If the piece isn't recognizable, it does not do a good job
 - It thinks the difficult trumpet piece is not difficult
 - When asked which parts were difficult
 - Not the same music
 - Not even that difficult compared to other parts from the music
- 

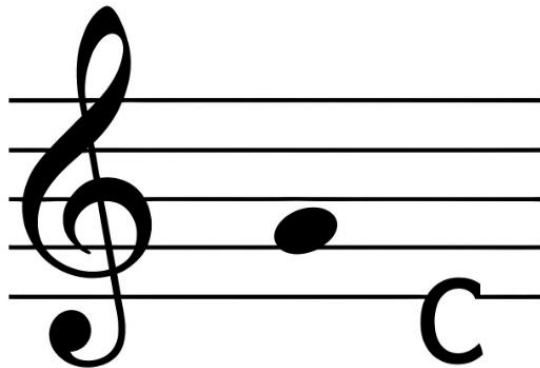
Image Generation

Show me where C is on a treble clef

- Very basic question if you play music on a treble clef
 - Tests basic knowledge on music composition



Results



That is A on
the treble clef,
not show me
where A is on
the treble clef



What we
know so far

ChatGPT does not know
how to generate music

- C -> A
- A -> E

Not even consistently wrong

- Different range of difference
- Overall: Very confused

Show me a sheet music of hot cross buns in piano

- Very rudimentary score that is commonly played for beginners
 - Easy to play and get students used to playing the instruments

Hot Cross Buns

Right Hand only

Traditional

Hot cross buns, Hot cross buns, One a penny, two a penny, Hot cross buns.

Copyright © 2014 Julie A. Lind

Results

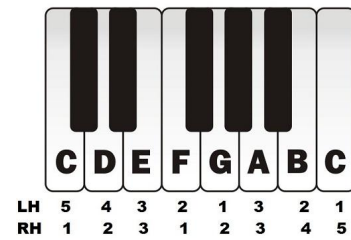
Hot Cross Buns

Hot cross buns on - a pen- One a penny, Two a pen-

Where is C on a piano

- Very basic question is you know how to play a piano
- Answer:

C MAJOR SCALE FINGERING



Here's how to find **C** on a piano:

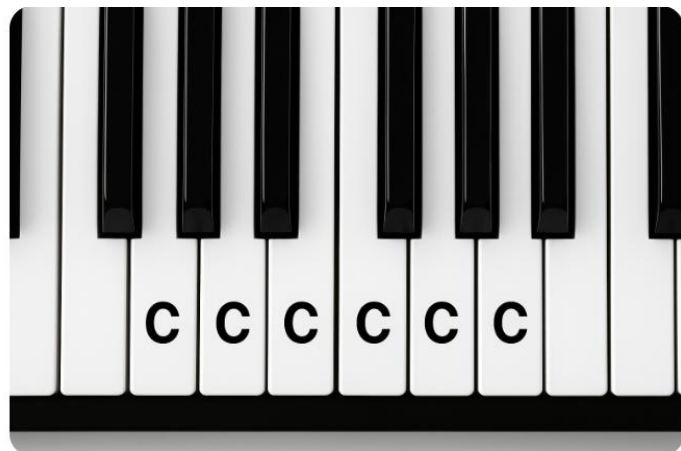
Look for the pattern of black keys.

- The black keys are arranged in groups of two and three across the keyboard.
- C is the white key immediately to the left of any group of two black keys.

There are multiple Cs on a piano — one near the middle is called **Middle C** (often labeled **C4** in notation).

Would you like me to show you an image marking all the Cs on a keyboard?

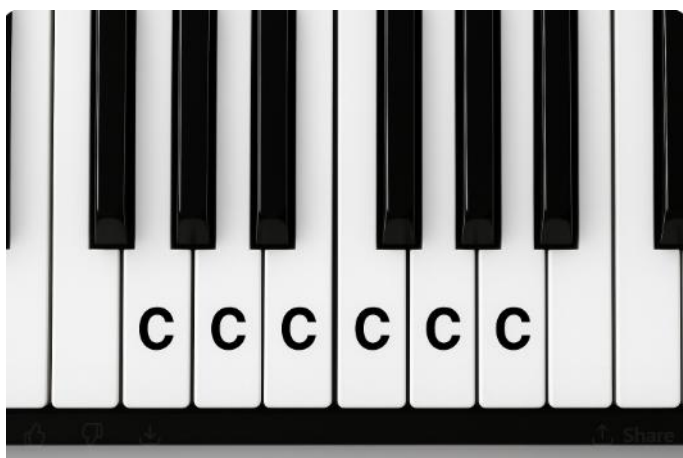
Result



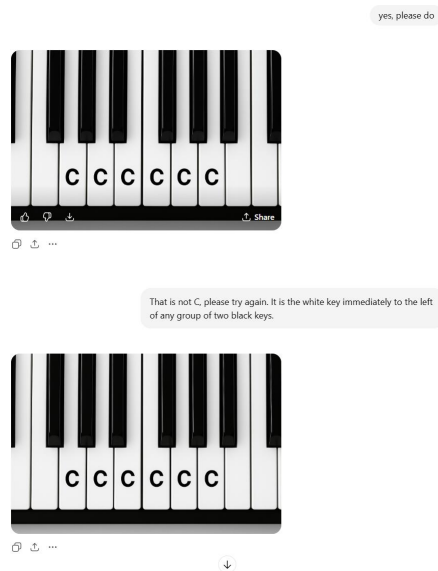
Correction

- That is not C, please try again. It is the white key immediately to the left of any group of two black keys.

Result



Evidence



Conclusion:

- ChatGPT has access to very surface-level knowledge when asked basic composition questions
 - Nothing you can't find with a 2 second google search
- ChatGPT does not correctly understand how music/composition work when given/making sheet music
 - Generate something resembling music, but it is inaccurate and not correct

