

Jason Freeman

Shadows (2015)

for solo piano

Performance Guide

About the Piece

In *Shadows*, the pianist reads an open-form score from a laptop screen, choosing his own path through a series of connected musical fragments. At the same time, the laptop listens to the pianist, tracks the decisions he makes about what to play, and constantly updates the score in response. This dialogue between pianist and computer, actuated through a dynamic score, serves to amplify the expressive decisions made by the pianist, to subtly push him in new musical directions, and to create large-scale structural arcs in the music.

Shadows consists of four movements, each of which explores the pianist-computer-score interaction from a different perspective:

- I. *Traces*. The score consists of twelve chords followed by their echoes. The speed at which the pianist moves from chord to chord affects how much of the score is displayed and how much is hidden.
- II. *Chorale*. The pianist plays from a selection of five chords and three embellishment notes. Each time a chord or note is played, its harmonic density and complexity is changed.
- III. *Perpetual Quiet*. The pianist builds arpeggios from a constantly changing set of pitches.
- IV. *Perpetual Melody*. The pianist chooses from a combination of rhythmically driven, short melodic motives and chords. Connections between fragments are added and removed based on the amount each fragment is being played.

I wrote *Shadows* for pianist Melvin Chen, during an artistic research residency at IRCAM in Paris. Many thanks to Arshia Cont and Jean-Louis Giavitto from IRCAM and to Dominique Fober from GRAME for collaborating with me to extend their Antescofo and INScore software, respectively, for use in this piece.

This work, including the software, this document, and the music, is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Duration

All movements have some variability in their duration. The total piece lasts approximately 18 minutes.

Technical requirements

In order to perform Shadows you need:

- A Mac laptop (Windows is not currently supported)
- A microphone. (It is possible to use the laptop's built-in microphone if necessary.)
- The Shadows software

It is optional but strongly recommended to have:

- Two high-quality mics suitable for close mic'ing of a piano (e.g. Rode NT5, Shure SM81, DPA 4021)
- An audio interface with 2+ mic preamps (e.g. Focusrite Scarlett, PreSonus AudioBox)
- A video projector

Setup

The setup is entirely self-contained. Place the components as follows:

- **Mics 1 and 2** should be on boom stands, inside the piano.
- The **laptop** should be placed on the piano, where the sheet music is normally placed.
- The **audio interface** should be placed either next to the laptop on the piano or on the floor.
- The **projector screen** should be visible to the audience. It does not need to be visible to the pianist.

Connect the system as follows:

- Connect mic 1 and 2 to input channels 1 and 2 on the audio interface (e.g. with XLR cables).
- Connect the audio interface to the laptop (e.g. with a USB cable).
- Connect the video output of the laptop to the projector (e.g. VGA or HDMI).
- Connect the laptop and audio interface to electrical power if necessary.

That's it! Do not connect anything to a PA system. All of the sounds in the piece are the acoustic, unamplified sounds of the piano.

Installing the Shadows Software

Shadows runs on any recent Mac computer. It requires the Java Runtime Environment. You must use the older Apple Java runtime, not the newer one from Oracle.) If you do not have it already, the software will prompt you to download it, or you can go directly to:

<https://support.apple.com/kb/dl1572>

You also need to install Cycling '74's Max 7. This software is free to install and does not require purchase to open and run Shadows:

<https://cycling74.com/downloads/>

Once you have downloaded Shadows, simply double click the “_shadows.maxpat” file to open the software. Configuration options in the application are extremely simple:

- Press the microphone button to activate audio input.
- Monitor input levels with the level meter and move the triangle up and down to adjust input gain.
- Press the 1, 2, 3, and 4 keys to begin each of the 4 movements.
- Press the a and p keys to toggle fullscreen mode for the audience projection and piano notation, respectively. (You'll want to set up your computer in dual-screen mode – not mirroring – and make sure to drag the piano notation window to the laptop screen and the audience projection window to the projection screen. That way, each will expand to full screen on the correct display.)
- Click the audio device settings button to modify your audio device settings. (You'll usually need to do this to select the correct audio interface for input.)
- Click the reset button or press the r key to reset the computer listener without resetting anything else in the movement. This is a “panic” button to press during performance if the score ever gets stuck on a fragment and stops following you.

Practice and Performance Tips

Before you ever start up the computer software, spend some time practicing the musical fragments on their own. (They are printed at the end of this document.) Practice each fragment individually. Then practice connecting them together to form larger phrases. Then practice with more elements — dynamics, articulation, rubato, accelerando / decelerando, pedaling, etc. — to shape these phrases into your own expressive interpretations of the music.

When you do start practicing with the computer, strike a balance between your personal interpretation and the real-time changes in the musical score. The changing score may sometimes support the expressive goals you have, and it might sometimes work against them. You'll similarly want to sometimes change your plans to go in the direction the score seems to suggest, and at other times push against the score to see if it will follow you.

I. Traces

The musical material for this movement consists of 12 musical fragments. Each fragment is a chord followed by an “echo” of a single note from the chord.

To play a fragment, play the chord and then play the echo note as many times as you wish (e.g. 1 time, 5 times, 100 times, or 0 times). Then you may repeat the fragment by playing the chord and echo note(s) again, or you may move on to another fragment.

You may start the performance with any fragment you choose.

The tempo is entirely up to you, but every chord and echo note should be equal in duration. Rubato is fine, and accelerandos and decelerandos to transition to new tempi are also fine. Do not change tempo suddenly. Convey a sense of regular meter only if and when you wish to do so.

Pedaling is also entirely up to you. If you do use pedal, please re-pedal every time you move to a new fragment. This helps the computer hear the fragment change more easily.

The computer tracks the choices you make about which fragments to play and how long to play each one. It always highlights the fragment you are currently playing in blue and draws thick black lines to the fragment(s) you can choose to play next.

During your performance, the computer will vary how many choices it gives you about what to play next, as well as how many fragments of the score are visible. It bases these decisions on a) the amount of time you spend playing a fragment before moving to another; and b) how many different fragments on the score you have played recently. If you repeat a single fragment for a long time, or alternate between just a couple of fragments for a long time, the score will “close in” on you and your choices will diminish. If you move constantly from one fragment to another all around the score, the entire score will gradually become visible.

The performance should last approximately 4.5 minutes. A timer at the bottom of the score shows elapsed time for your reference.

There are some subtle changes to the computer algorithm during the course of the performance. At the beginning (0'00"-1'30") and the end (3'00"-end), the computer favors displaying fragments you play most often. In the middle (1'30"-3'00"), the computer instead favors displaying fragments you play least often. In this way, the beginning and ending of the piece push you to repeat familiar material while the middle pushes you to explore new areas of the score.

II. Chorale

The musical material for this movement consists of 34 musical fragments. Each fragment is a chord or a single note. To play a fragment, simply play the chord or note. You should generally not repeat the fragment before moving to the next. (An occasional, single repetition is acceptable for expressive purposes.) You may start the performance with any fragment you choose.

The duration of each fragment is entirely up to you. You can keep a sense of a regular meter or play ametrically (or do both at different times). If/when you do play metrically, each fragment need not have the same note duration. Long delays between fragments are acceptable, but generally try to sustain through from one fragment to the next. Rests, if they do occur, should be brief.

Feel free to use pedal liberally and to keep the pedal down between fragments if you feel it appropriate. If you are playing two successive fragments that share one or more common pitches, you can tie those common pitches over or you can re-attack them.

The computer tracks the choices you make about which fragments to play. It always highlights the fragment you are currently playing in blue. The fragments you can choose to play next are displayed in black. (Fragments that you cannot choose are displayed in light gray.) There are no lines drawn to your choices because this would make the score too cluttered to read.

At any given moment, one fragment in each of the first five rows is available as a choice. The computer's algorithm for selecting these fragments is simple. After you play a fragment in a given row, it is deactivated and the next fragment in the row is activated. When you get to the end of the row, you "turn around" and move backwards through the row back to the beginning. Small arrows above fragments indicate the direction in which you are currently traveling.

The bottom row works differently from the rest. These single notes are always available as choices: you do not "travel" through the row but instead play any fragment visible in the row at any time. When you play one of these fragments, it will not be highlighted in blue because of limitations to the computer's listening algorithm. To remind you of the special role of the fragments in this last row, they are highlighted in green throughout the performance. Please also note the ottava treble clef for these fragments and be sure to play the notes 8va as that clef indicates.

As the title of this movement suggests, the spirit of this movement is a chorale (perhaps more Ives and minimalist than Bach). Connect smoothly from chord to chord, build larger phrases (and use duration, dynamics, articulation, and pedaling to help with that), and add in the notes from the final row as (mostly) subtle decorations to the music. Because the chords are sparser on the left side and denser on the right side, there is a natural tendency to play the left-side chords softly and the right-side chords loudly. Be aware of this, and do not be afraid to play against this tendency sometimes.

The performance should last approximately 4 minutes. A timer at the bottom of the score shows elapsed time for your reference.

Over the course of the performance, the computer gradually changes which fragments are visible. At the beginning, only the fragments on the left side of the score are displayed. By the middle of the performance, all fragments are visible. Fragments are then gradually hidden again until the end, when only the right-most fragments remain.

III. Perpetual Quiet

The musical material for this movement consists of 19 musical fragments. Each fragment is a single note. Unlike other movements, the fragments are not displayed in separate boxes. They are simply displayed as a series of notes on a single grand staff.

To play a fragment, simply play the note. You should never repeat the fragment before moving to the next.

You may start the performance with either of the two fragments shown at the beginning.

The tempo is up to you, but should generally be at least 104 b.p.m. (with each note played as an eighth note). It can be faster whenever you wish and can occasionally be slower. Every note should be equal in duration. Rubato is fine, and accelerandos and decelerandos to transition to new tempi are also fine. Rare subito changes in tempo are acceptable as well. Convey a sense of regular meter only if and when you wish to do so.

Do not use sustain pedal at all. Use soft pedal at your discretion.

The computer tracks the choices you make about which fragments to play. It always highlights the fragment you are currently playing in blue. The fragments you can choose to play next are displayed in black. (Fragments that you cannot choose are displayed in light gray.) There are no lines drawn to your choices because this would make the score too cluttered to read.

You can move left to right across the score to play each fragment (thus creating repeating upward arpeggios), but you can also play them in any order you choose and can vary this order regularly. You can skip fragments as you move from left to right, you can go backwards, or you can play them completely out of order.

The computer changes the fragments you can choose to play in two ways. First, it cycles through groups of fragments (each group is 3 consecutive notes except for the lowest-pitched group, which consists solely of the low D). Once you have played one note in the group a certain number of times, it grays out that note and moves on to another note in the group. Once you have played the new note enough times, it moves on to the next, and then eventually back to the first, and so on. (The number of times you must play each note before progressing varies.)

Second, over the course of the performance the computer activates and deactivates different groups of fragments. These changes occur at predetermined times. (There are never more than 5 of the 7 groups active at any given time.)

In the spirit of the title of this movement, try to convey a sense of constant motion (through the arpeggios) but within a gentle, relaxed context. Dynamics should generally be soft.

The performance should last approximately 4.5 minutes. A timer at the bottom of the score shows elapsed time for your reference.

IV. Perpetual Melody

The musical material for this movement consists of 39 musical fragments, divided into 3 sections of 13 fragments. Each fragment is a short, rhythmic motive.

To play a fragment, play it as notated at a steady tempo. You may repeat a fragment as many times as you wish before moving to another fragment (though you need not repeat it at all). When moving on to another fragment, you should generally continue in time and tempo, without pause. (Occasionally, you may also hold the final note of a fragment as a fermata before moving on, or you may insert a rest of indeterminate length between fragments.) You can create a sense of regular meter if and when you wish, even if that meter does not align with the start of fragments. (For example, you could play a series of 3-eighth-note fragments in a row as if they are in 4/4 time.)

You may start the performance with any fragment you choose.

There is considerable flexibility with regards to tempo: it can be as slow as 72 bpm per quarter note or as fast as 144 bpm. Feel free to vary tempo considerably, both via gradual accelerandos and ritardandos and via subito changes to tempo.

Use pedal sparingly if at all.

The computer tracks the choices you make about which fragments to play and how long you play each one. It always highlights the fragment you are currently playing in blue and draws thick black lines to the fragment(s) you can choose to play next.

During your performance, the computer will vary how many choices it gives you about what to play next, as well as how it determines your options. It bases these decisions on which fragments you have played recently and for how long you have played each. At some points in the performance, the computer will push you towards repeating and alternating between the fragments you have played most often. At other points, it will push you to play fragments you have not played recently. Some aspects of the computer's algorithm, such as how many choices to give you and when to change sections, are updated automatically at predetermined times during your performance.

The performance should last approximately 5 minutes. A timer at the bottom of the score shows elapsed time for your reference.

The performance is divided into three sections, each with a different set of fragments. The sections begin at 0'00", 1'30", and 3'00". As the piece moves from one section to the next, try to quickly end the phrase you are currently playing and then start the new one by playing the fragment highlighted in blue.

In the spirit of the title of the movement, try to convey a sense of a melody that is constantly evolving, as opposed to a series of disconnected motives that are each statically repeated and juxtaposed. The music can at times be driving and at other times be meandering and almost romantic, with extensive rubato.

Frequently Asked Questions

The computer sometimes makes a mistake and mis-identifies which fragment I am playing. What should I do?

The listening software is good but not perfect, and it occasionally thinks you are playing something different from what you are actually playing. Pianists are also good but not perfect, and they occasionally miss a note that may confuse the computer listener.

If you are playing one fragment and the computer thinks you are playing another, keep playing what you are playing, but pick the next fragment to play based on the choices the computer displays to you.

If the computer seems to be constantly mis-identifying fragments, check your audio setup. Make sure you are using high-quality microphones that are positioned as close inside the piano as possible and that the audio input level to the software is neither too soft nor too loud.

The software seems to start up fine but I don't ever see the score. What should I do?

Sometimes, security restrictions on your machine may prevent the INScore score display software from launching automatically the first time you use Shadows. If so, try the following: 1) Quit Max. 2) Double-Click the INScore application (in the same folder as _shadows). 3) If it still does not open, try right-clicking the INScore application and selecting "open" from the popup menu. 4) Once INscore has opened, quit it immediately. Then relaunch _shadows and all should be well.

Getting Help and Getting in Touch

Please do not hesitate to contact me with technical questions, bug reports, or other issues. I would also love to hear about your experiences with Shadows.

I can be reached via:

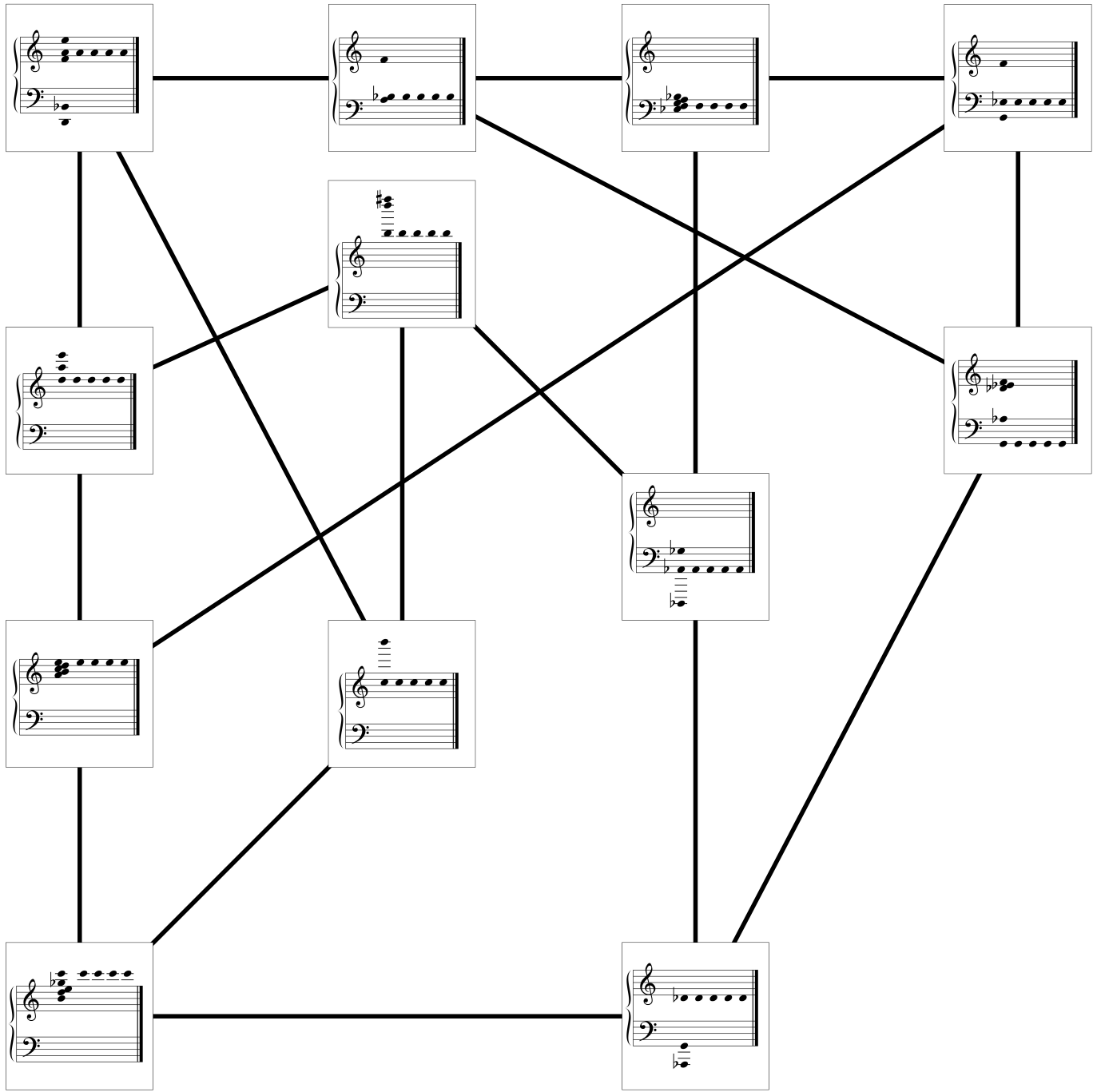
<http://www.jasonfreeman.net/contact/>

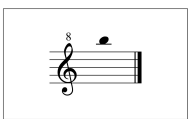
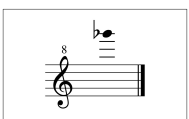
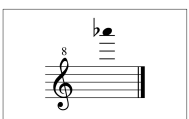
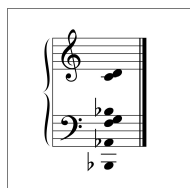
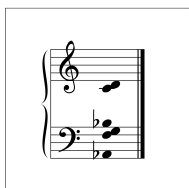
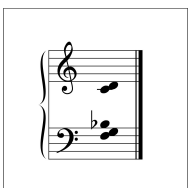
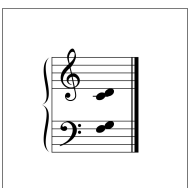
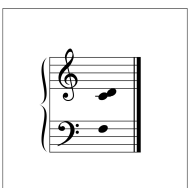
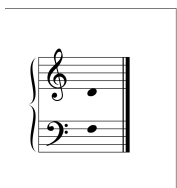
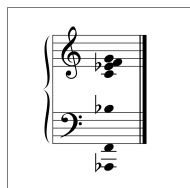
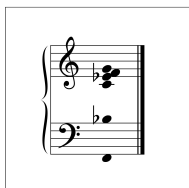
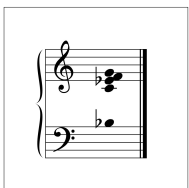
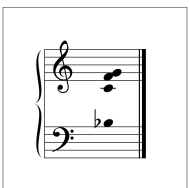
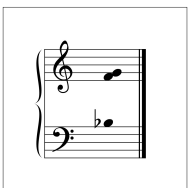
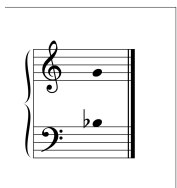
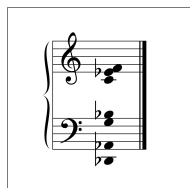
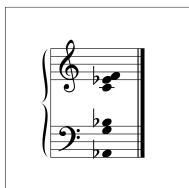
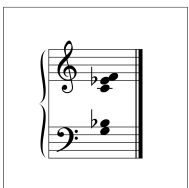
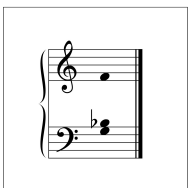
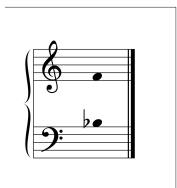
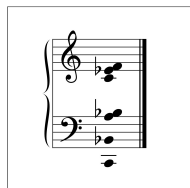
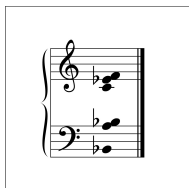
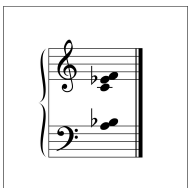
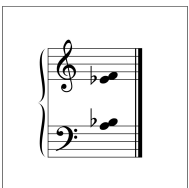
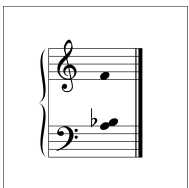
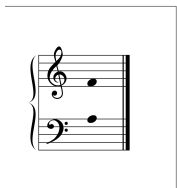
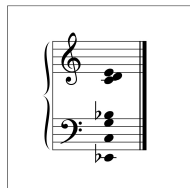
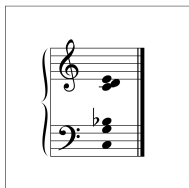
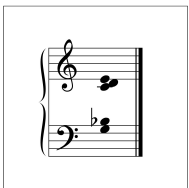
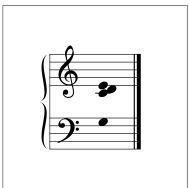
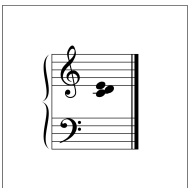
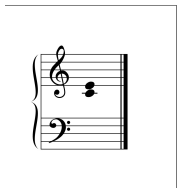
Most importantly, have fun with Shadows!

Jason Freeman

Paris, France and Atlanta, Georgia

July 23, 2015





A musical score for piano, consisting of two staves: a treble clef staff on top and a bass clef staff on the bottom. The music is written in a key signature of one sharp (F#) and a common time signature (C). The piece begins with a single note on the bass staff, which then moves to the treble staff. The melody in the treble staff is a series of ascending half notes, starting from the second line (D4) and ending on the first space (F#5). The bass staff provides a harmonic accompaniment, starting with a single note on the second line (D3) and then moving to the first space (F#3), followed by a series of ascending half notes: G3, A3, B3, C4, D4, E4, F#4, G4, A4, B4, C5, D5, E5, F#5. The piece concludes with a double bar line.

