

Build a Mini Piano in Java

Create a command-line "Mini Piano" application that allows a user to type keys on their keyboard to play musical notes.

Provided Code

You are given a helper class called **Tone.java**.

- It contains a method **public static void play(double frequency)** which generates a sound for a specific frequency (in Hertz).
- Do not modify this file. Just use it to produce sound.

Your Task

You need to create two files: **Piano.java** and **App.java**.

1. Piano.java

This class handles the logic of mapping computer keys to musical notes/frequencies.

- **Key Mapping:** Implement a method `showKeyMapping()` that prints the instructions to the console so the user knows which keys to press. Use the following chart:

Key	Note	Frequency (Hz)
a	C	261.63
s	D	293.66
d	E	329.63
f	F	349.23
g	G	392.00
h	A	440.00
j	B	493.88
k	High C	523.25

- **Play a Single Note:** Implement a method (e.g., `playNote`) that takes a single character key as input.
 - It should check which key was pressed (if/else).
 - It should print **"Playing note: [Note Name] ([Frequency] Hz)"**.
 - It should call **Tone.play(frequency)** with the correct frequency.
 - If the key is not in the list, it should do nothing.

- **Play a Sequence:** Implement a method `playSequence(String input)` that:
 - Loops through each character in the input string.
 - Calls your `playNote` method for each character.

For loop implementation example in Java:

```
for (int i = 0; i < input.length(); i++) {  
    // do something in a loop  
}
```

2. App.java

This is the main entry point of your application.

1. In the main method, call ***Piano.showKeyMapping()*** to display the instructions.
2. Use a Scanner to ask the user to "Enter keys: ".
3. Call ***Piano.playSequence()*** with the user's input to play the melody.
4. Close the scanner.

App Example:

Piano Keys Mapping:

a = C (261.63 Hz)
s = D (293.66 Hz)
d = E (329.63 Hz)
f = F (349.23 Hz)
g = G (392.00 Hz)
h = A (440.00 Hz)
j = B (493.88 Hz)
k = C' (523.25 Hz - High C)

Enter keys: asd

Playing note: C (261.63 Hz)

Playing note: D (293.66 Hz)

Playing note: E (329.63 Hz)