

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)
```