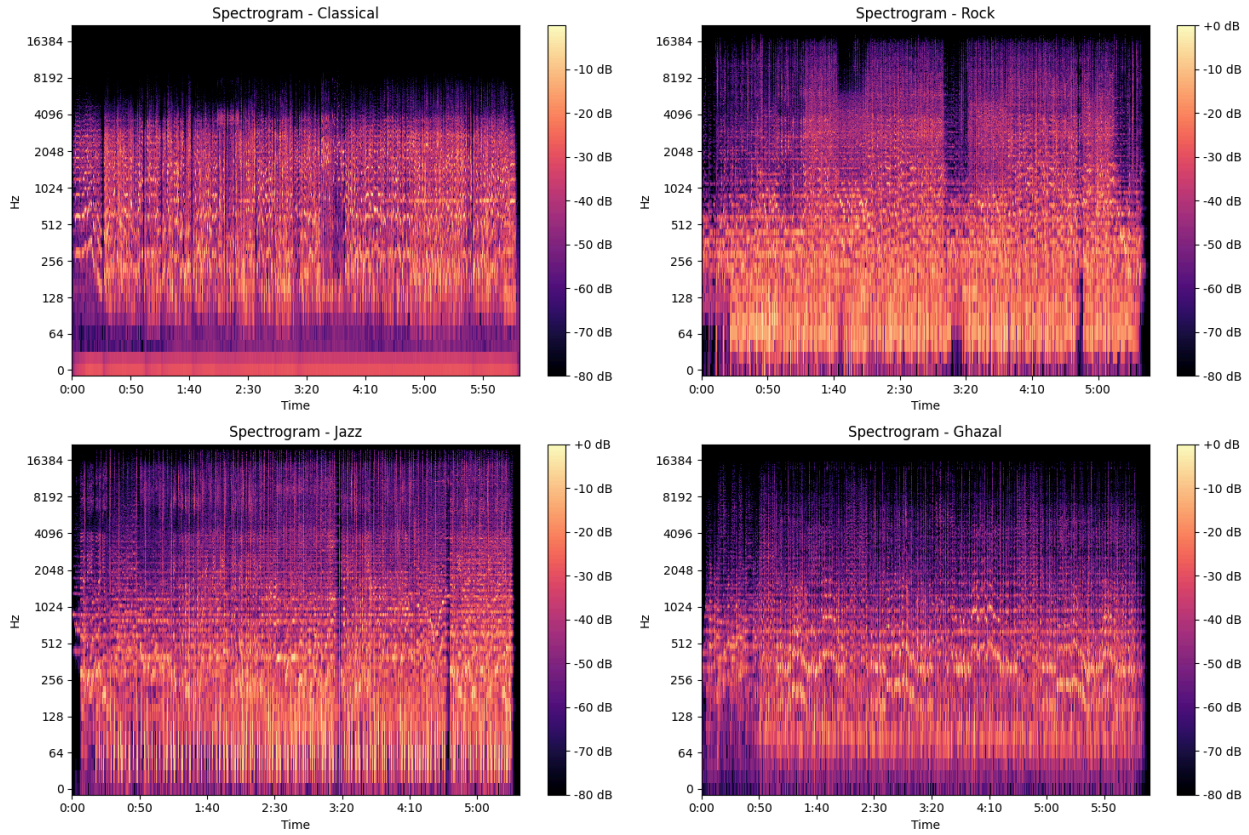

Code :
https://github.com/M23CSA520/Speech_Understanding_PA1/blob/main/m23csa520_speech_q2_taskb.py

Songs Used :

```
song_paths = {
    "Classical": "/content/songs/Alvida - Life In A Metro 320 Kbps.mp3",
    "Rock": "/content/songs/Alvida - Life In A Metro 320 Kbps.mp3",
    "Jazz": "/content/songs/Hosanna - Ekk Deewana Tha 320 Kbps.mp3",
    "Ghazal": "/content/songs/Woh Kaghaz Ki Kashti - The Latest 320 Kbps.mp3"
}
```

Analysis of the Spectrograms for Different Music Genres:

- **Classical Music:**
    - Has a wide range of frequencies present, covering both low and high frequencies.
    - The distribution appears more uniform with fewer sudden bursts.
    - Lower intensity variations, suggesting a more continuous, smooth sound.
- **Rock Music:**

    - More prominent energy in the mid-to-high frequency ranges.
    - Noticeable gaps where sound intensity drops, possibly due to variations in instrumentation (e.g., breaks in guitar riffs or vocals).
    - Likely contains more percussive elements.
- **Jazz Music:**
    - A rich spread across frequencies, similar to classical, but with more pronounced variations.
    - Shows distinct patterns at different time intervals, possibly due to the improvisational nature of jazz.
    - More dynamic than classical music but smoother compared to rock.
- **Ghazal Music:**
    - Dominated by lower and mid-range frequencies.
    - Less intensity in the high-frequency range, indicating softer instruments and vocal emphasis.
    - A more gradual and flowing structure, consistent with the melodic nature of Ghazals.

Comparison Summary:

- **Classical & Jazz** have a smoother, more continuous frequency spread.
- **Rock** is more dynamic, with bursts of high-energy frequency content.
- **Ghazal** stays in the lower and mid-frequency ranges, giving it a soft and melodic feel.