NU LAGUNA

COURSE MATERIAL NO. 1

SOUND PRODUCTION DESIGN
MUSIC THEORY

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BMMA INSTRUCTOR

I. MUSIC THEORY

Making music is intrinsically human and studying music theory is not required to become a sound designer. Understanding music theory, on the other hand, may aid in your comprehension of how music is composed and read. It'll come in handy if you want to write your own music. It's also useful if you want to arrange a piece of music, which involves changing the way the music is written to make it acceptable for different reasons.

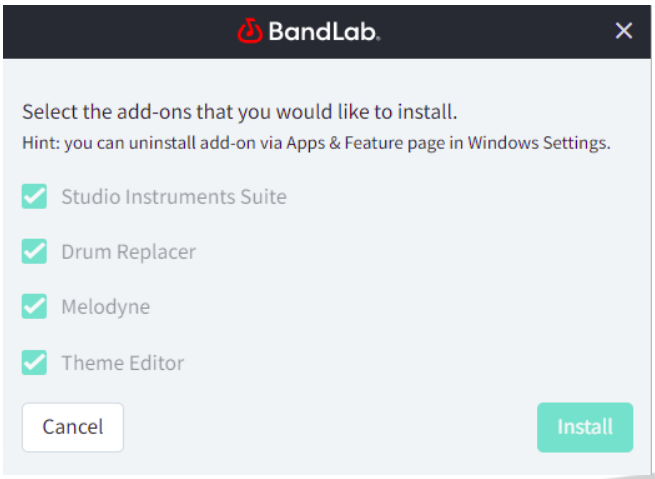
In this lesson I will teach you the fundamentals of music theory. To be honest, this lesson will barely scratch the surface of the subject, but it should be enough to get you started with understanding music.

Note that I will be introducing concepts differently in this lesson. Instead of using the traditional musical notations I will use the user interface of the Digital Audio Workstation to explain the concepts. I have chosen Cakewalk by BandLab due to its intuitive features and free license.

To download Cakewalk go the link below and download the installer:
https://www.bandlab.com/products/cakewalk

Note on the installation: There are free plugins including some nice virtual instruments that will be useful in our course.

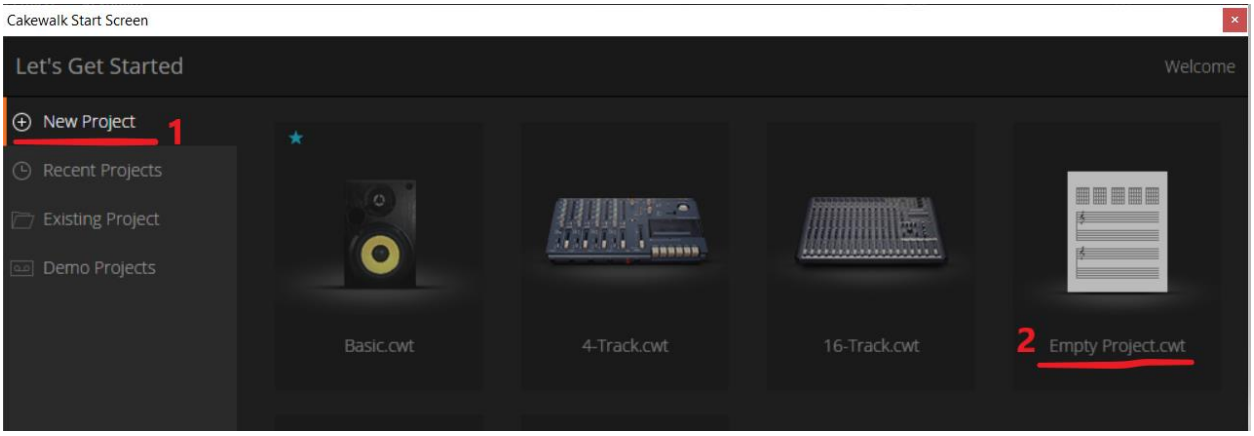
Be sure to place a check on "Studio Instruments Suite" and install. The other plugins are optional.



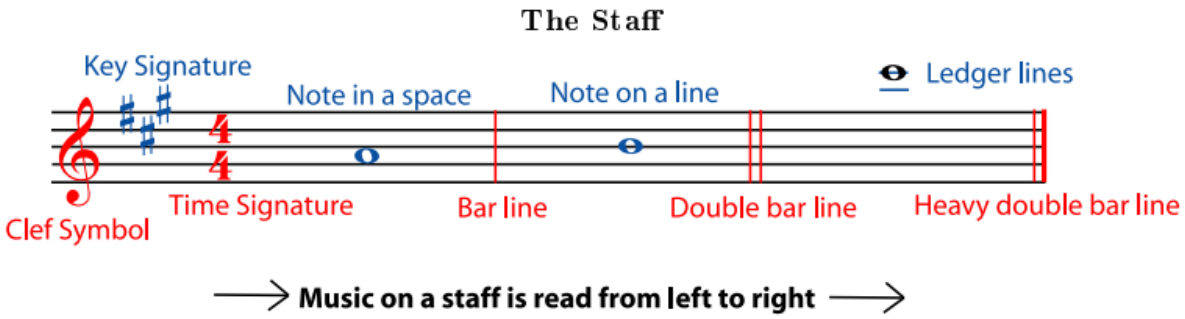
II. BARS and BEATS

A measure (or bar) is a single unit of time in music theory that has a given number of beats played at a specific pace. Composers divide their compositions into measures, which are easily digestible chunks that allow players perform the music as intended. When a piece of music is broken into measures, players only must process a little portion of it at a time, allowing them to focus on giving the greatest performance possible. Vertical measure lines or bar lines that run perpendicular to the staff are used to identify measures.

It'll be easier to understand if we apply it in action. Fire up Cakewalk and create a new project.

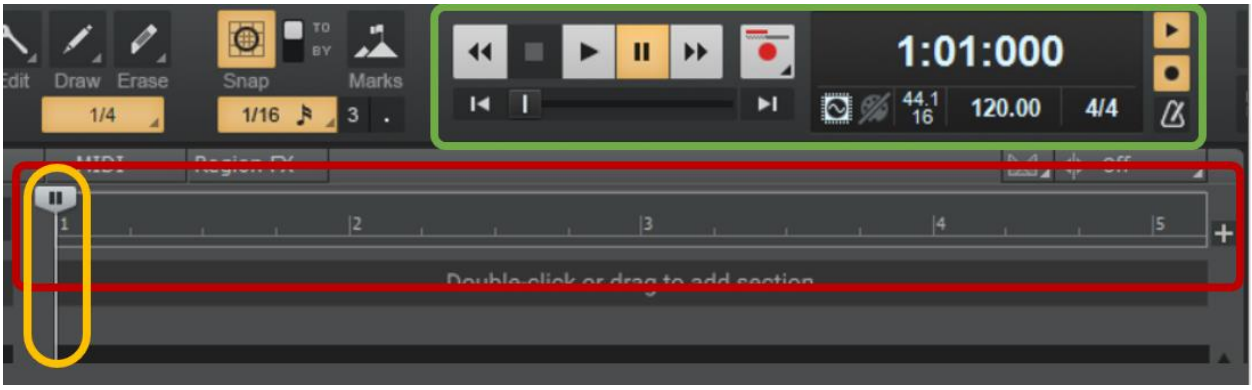


On the get started window choose **"New Project"** then click on **"Empty Project.cwt"**. The file extension of Cakewalk projects is "cwt".

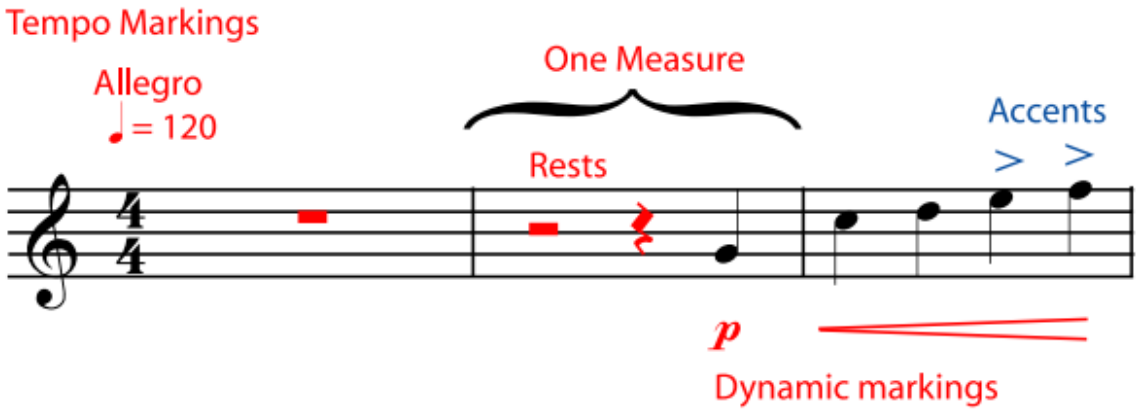


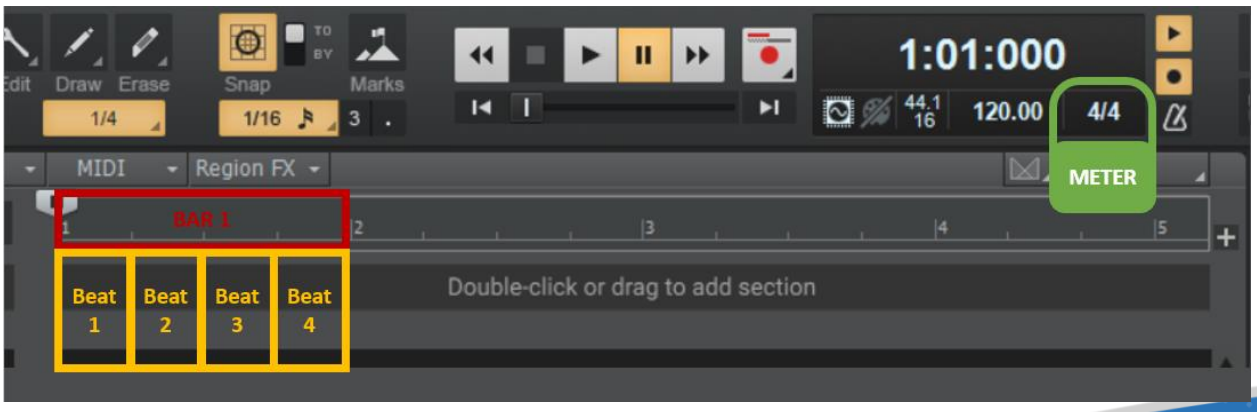
The workplace will come up. The user interface is composed of panels which are resizable. To adjust the panels, hover your mouse on its border and click + drag to adjust panel size.

The user interface might seem overwhelming but for now just focus your attention on a small section of the workspace.

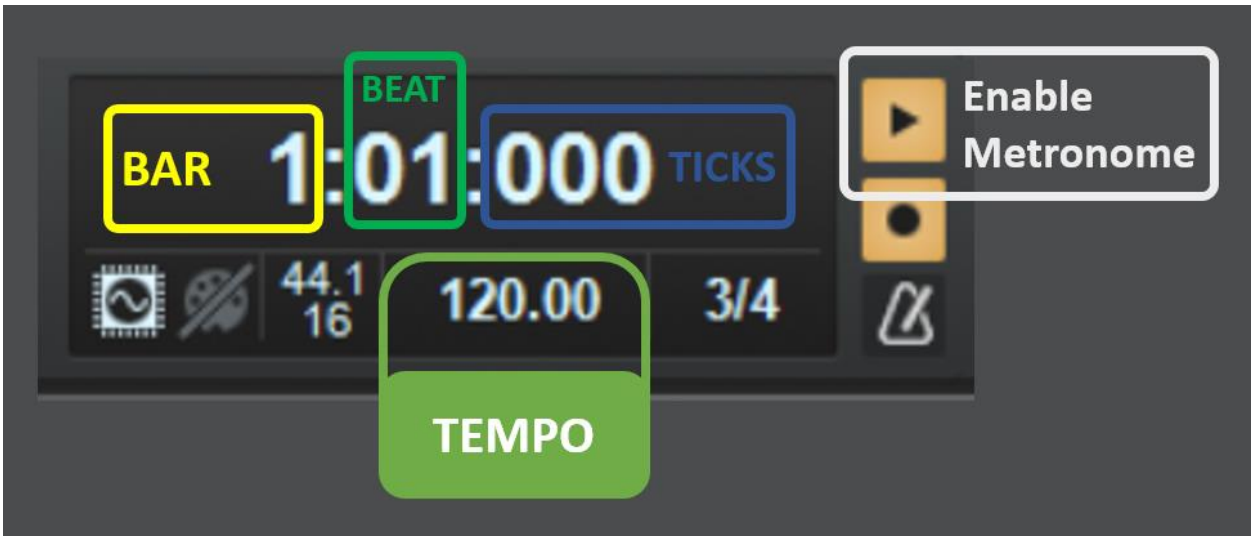


One bar is one measure. A bar contains beats. The number of beats depend on the measure. In this lesson we'll just explore two types of measures: 4/4 and 3/4. In 4/4 there are 4 beats in a bar. In a 3/4 measure there are 3 beats in a bar.





Tempo is the pace or speed at which a section of music is played. It is measured in Beats per minute (BPM). For instance, a tempo notated as 60 BPM would mean that a beat sounds exactly once per second. A 120 BPM tempo would be twice as fast, with two beats per second.

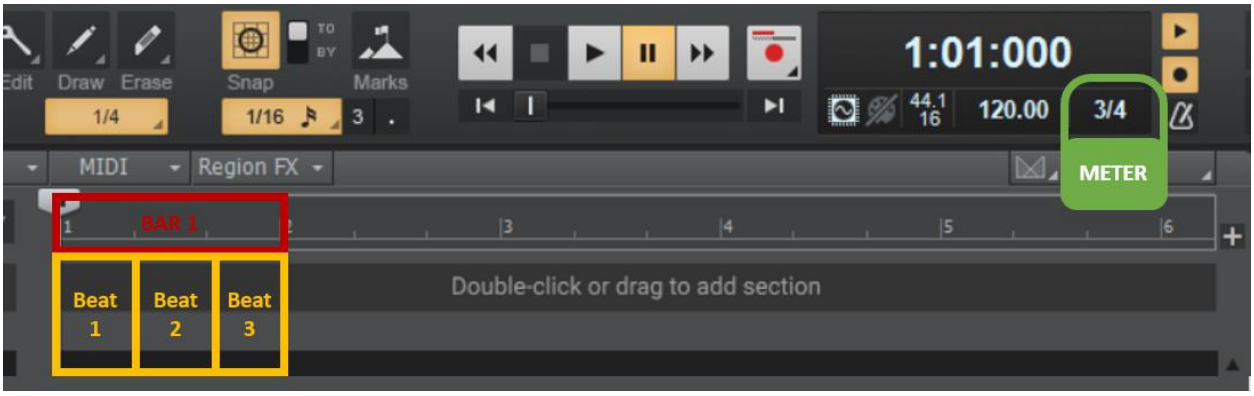


The Metronome

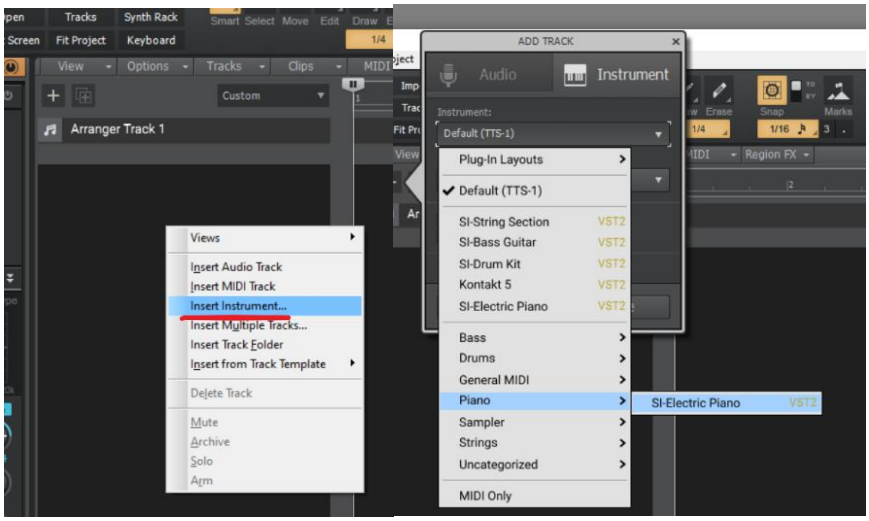
The purpose of a metronome is to keep a musician in line with the timing of their playing. It gives them the ability to follow a set tempo and follow along with whatever song, piece, or exercise that they're trying to play. Composers usually use a metronome for reference when writing musical compositions.

In the transport module, there is a button for turning the metronome sound on and off. Turn if on and hit play. You will hear ticking sounds corresponding to the beats. If your meter is set to 4/4 the metronome will produce a "tok-tik-tik-tik" pattern where "tock" is heard on every first beat of a bar. If your meter is set to 3/4 then your will hear a "tok-tik-tik-tik" pattern.

The hotkey for playing and stopping is the spacebar.



Let's bring the meter back to 4 beats per bar and add a virtual instrument (VST). There is a panel beside the time ruler called the Arranger panel. This is where tracks are stacked. Right-click on that panel's black area and choose "Insert instrument…".



Go to the Piano option and choose "SI-Electric Piano". Hit "Create". A new track will appear in the arranger panel.

If you click on the piano icon on the track, it will open the GUI of the VST. "SI-Electric Piano" is an electronic piano VST. If you click on the piano keys with your mouse, you should here it play notes. You can close the VST GUI for

now. VST produce sound using computer data called MIDI. Every time you click on the keys in the VST GUI a MIDI data is fed on the VST and a sound corresponding to that MIDI data is produced. There are external devices called MIDI controllers that you can use to play VSTs like an actual instrument.

Some MIDI controllers are designed to manipulate not only VSTs but also the DAW itself. For instance, the Studiologic SL Mixface can be used to control the faders and knobs of the DAW.

Most MIDI controllers are connected to the computer via USB.

Of course, not everyone participating in this course has access to MIDI controllers. The good news is that these are not required to produce music. In the next section we'll learn how to set your computer keyboard as your MIDI controller.

III. PITCH: SHARP, FLAT, AND NATURAL NOTES

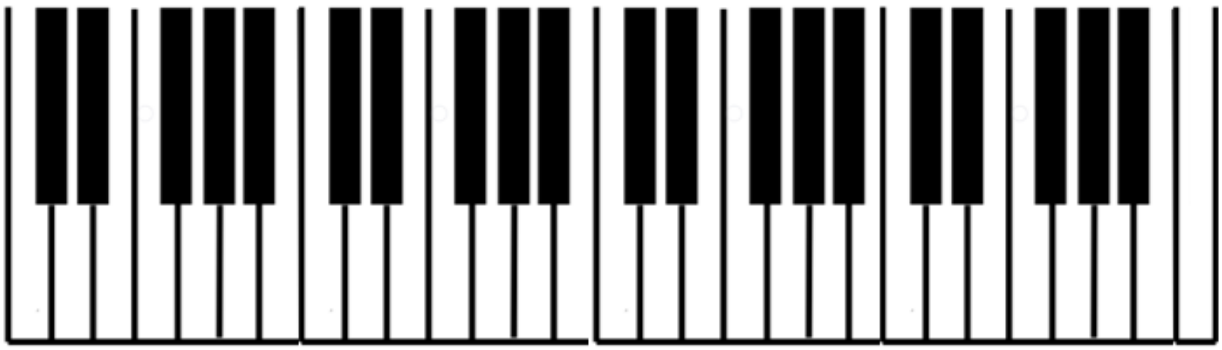
Natural Notes. The pitch of a note is how high or low it sounds. Pitch depends on the frequency of the fundamental sound wave of the note. The higher the frequency of a sound wave, and the shorter its wavelength, the higher its pitch sounds. But musicians usually don't want to talk about wavelengths and frequencies. Instead, they just give the different pitches different letter names: **A, B, C, D, E, F,** and **G.** These seven letters name all the **natural notes**.

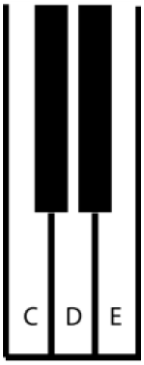
A B C D E F G. It's like the English alphabet but this one ends in "**G"**. Once you reach the last note you back to the first letter. Before you start memorizing the pattern, we have to change the sequence to start with "**C"**. So now that sequence is **C, D, E, F, G, A, B.** Now you can start memorizing. These are all the notes there is. No matter how many keys a piano has the notes will revolve around these seven letters.

Sharps and Flats. The black keys are your sharp and flat notes. The black key after C is C# (C Sharp). But if you're coming from D then the sane black key can be referred to as Db (D flat). A black key is both a sharp and flat note.

Any note can be a sharp or a flat — even white keys on the piano. For instance, the note B (a white key on the piano) can also be notated as C-flat. The note D (also a white key on the piano) can be notated as E double flat. Sharps are marked with "**#**" ang flats with "♭" (use lowercase **b** as an alternative.) Example: **C#, B♭.**

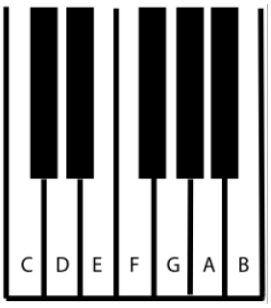
Below is a 49-key piano layout. So how on earth do musicians find the notes in that roll of keys?





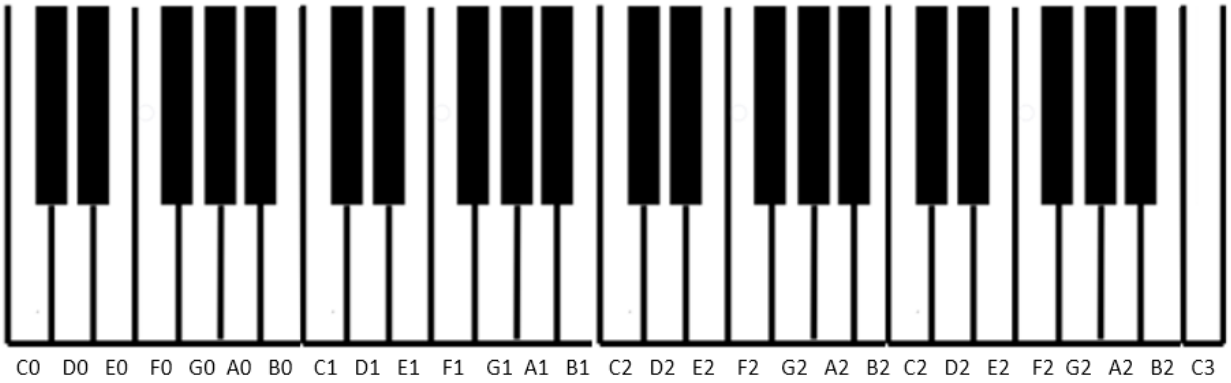
It's quite simple! The piano has white keys and black keys. If you pay attention, the white keys are bundled into two groups by the black keys.

Three white keys are bundled by two black keys and four white keys are bundled by three black keys. The two-black-key bundle starts with **C** and the three-black-key bundle starts with **F.**

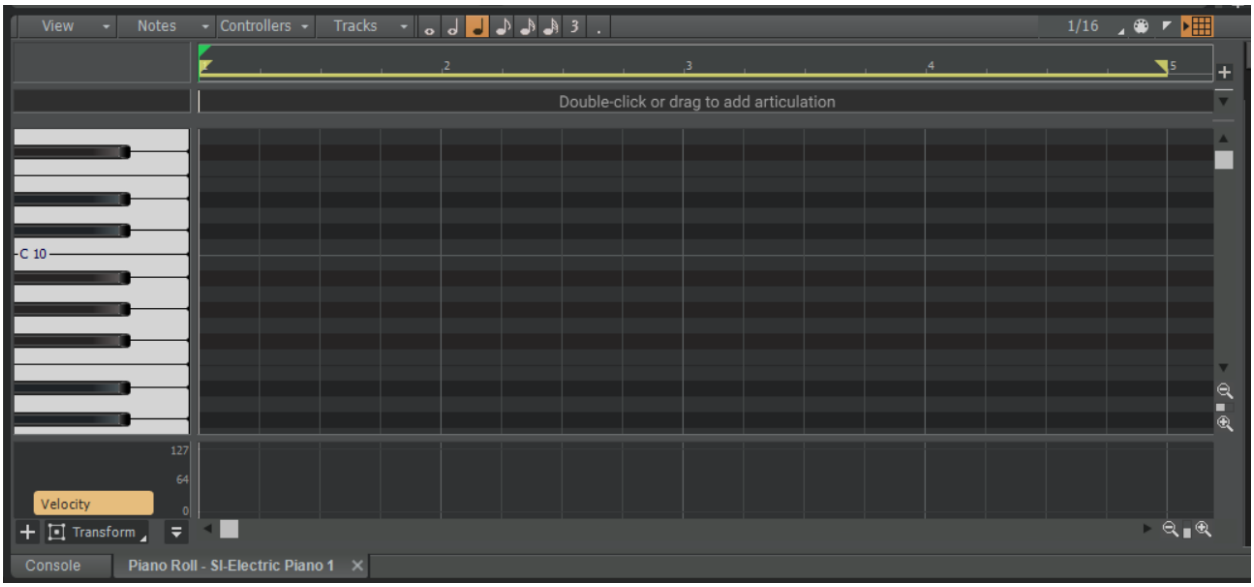


Octaves. An octave is an interval or a measure of distance between notes. Each octave starts with **"C"** and once it reaches the next set of keys it will still have the same note letters but double in frequency. The next **"C"** is the same key but higher.

In our DAW the octaves will be indicated by a number starting with zero (0). The first set of keys will be **C0, D0, E0, F0, G0, A0, B0…** the next set will be **C1, D1, E1, F1, G1, A1, B1…** then **C2, D2, E2, F2, G2, A2, B2…** so on and so forth.

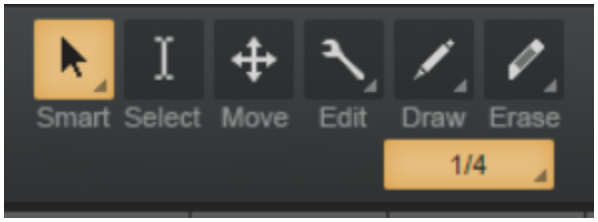


The number of octaves depend on the number of keys on the keyboard. In Cakewalk, the piano roll goes up to C10. To open the Piano Roll in Cakewalk, go to the menu bar, Views > Piano Roll View. The Piano roll will appear as a panel below the track panel. Click and drag on its border to give it more room in the workspace.



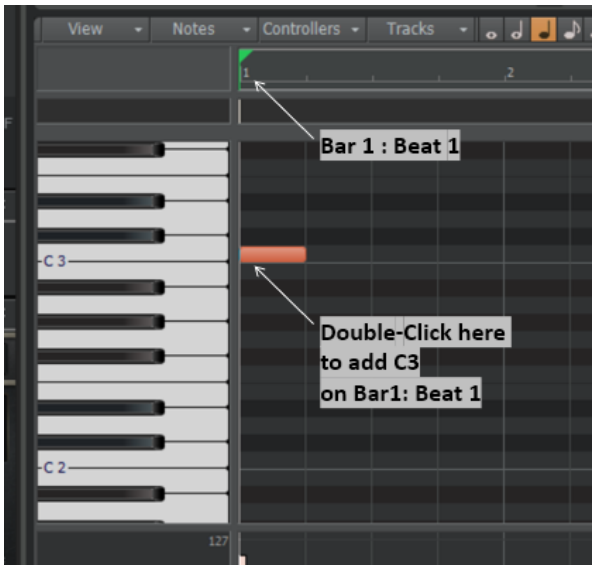
Piano Roll. Unlike a traditional piano the Piano Roll is standing upright. This is because the space at the center is where we'll lay down the notes relative to time (beats). If you click on the keys, you will trigger the sound of the instrument to which the Piano Roll is attached to. Assuming that you still have SI-Electric Piano, click on Views > Virtual Controllers > Computer Keyboard. A pop-up window will come up. While this window is open hotkeys be disabled and your keyboard will trigger the sounds of your VST. **Try it!**

The Z and X keys will allow you to move up or down an octave. The hold simulates the piano sustain pedal. It will make a note ring out instead of getting cut off upon release of the key.



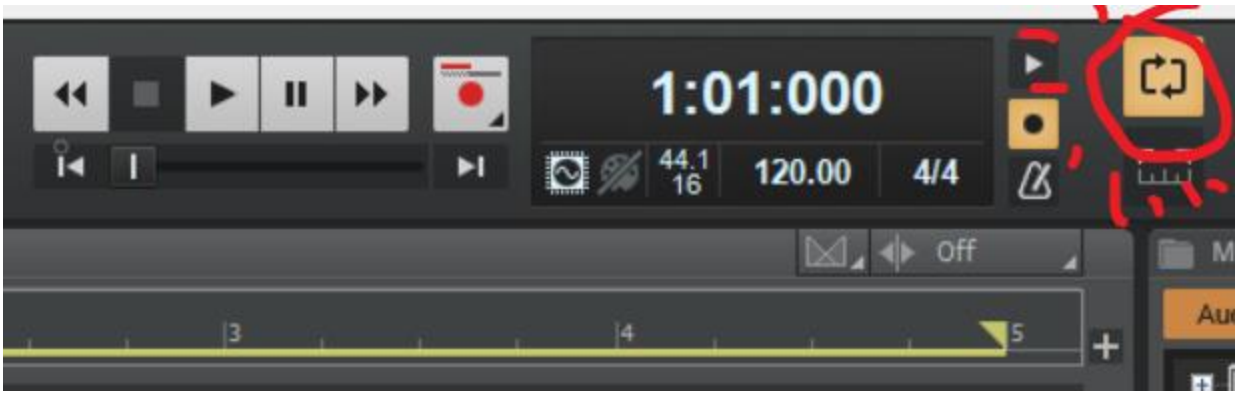
Playing single notes is easy and fun using the Virtual Controller but to get a full sound we need chords. We'll program the chords manually on the **Note Pane** using just the mouse.

On the Control Bar make sure the "Smart" tool is active. Hover mouse on the Piano roll keys and use your mouse wheel to scroll up and down. Look for the C3.

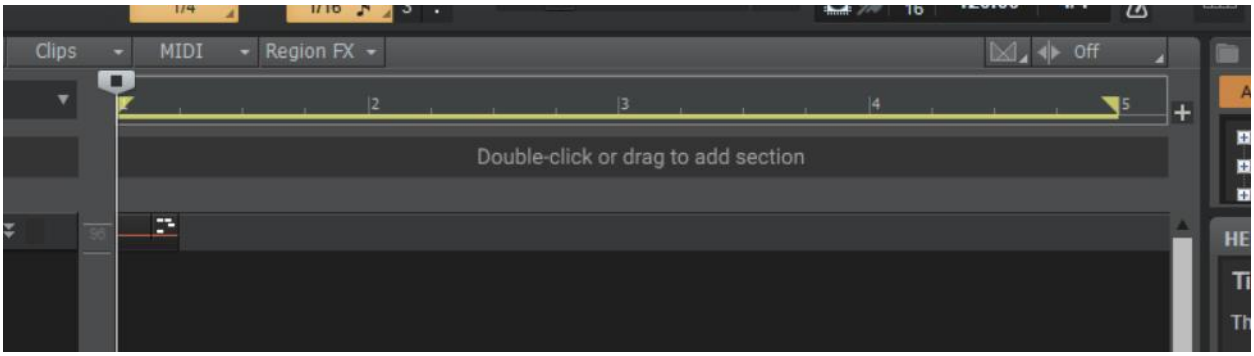


Double-click on the first beat of Bar 1. This will create a C3 note on Bar 1: Beat 1. Hit play and your will here the note play. This is how we'll lay down chord patterns. Before we continue to the next section let's setup a 4-bar loop on your time ruler.

As an exercise we'll use 4/4 meter at 120 bpm (defaults) and set it to loop within 4 bars in the time ruler.



Click on the “Loop” icon to enable loop.



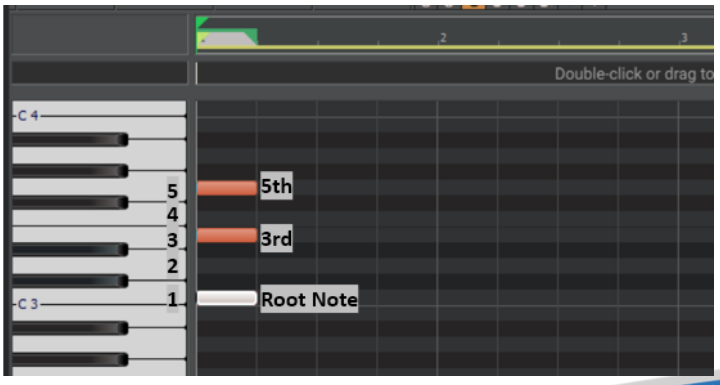
On the Time Ruler, Click and drag the end point of the yellow marker to occupy the space up to the last beat of Bar 4. Hit play and see how it loops back to Beat 1 of Bar 1 after reaching the last beat of Bar 4. In the next section we’ll lay down chord patterns for each bar.

IV. MAJOR AND MINOR

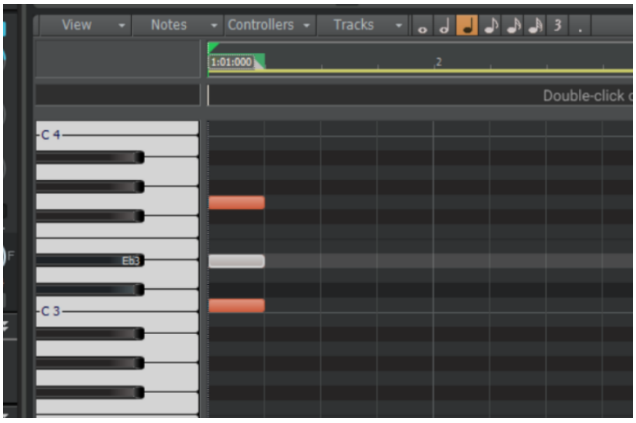
Major Chords. Here are the steps in creating three-note major chords:

1. Pick the root note.
2. Add the 3rd note from the root.
3. Add the 5th note from the root.

In short, use the 1-3-5 pattern.

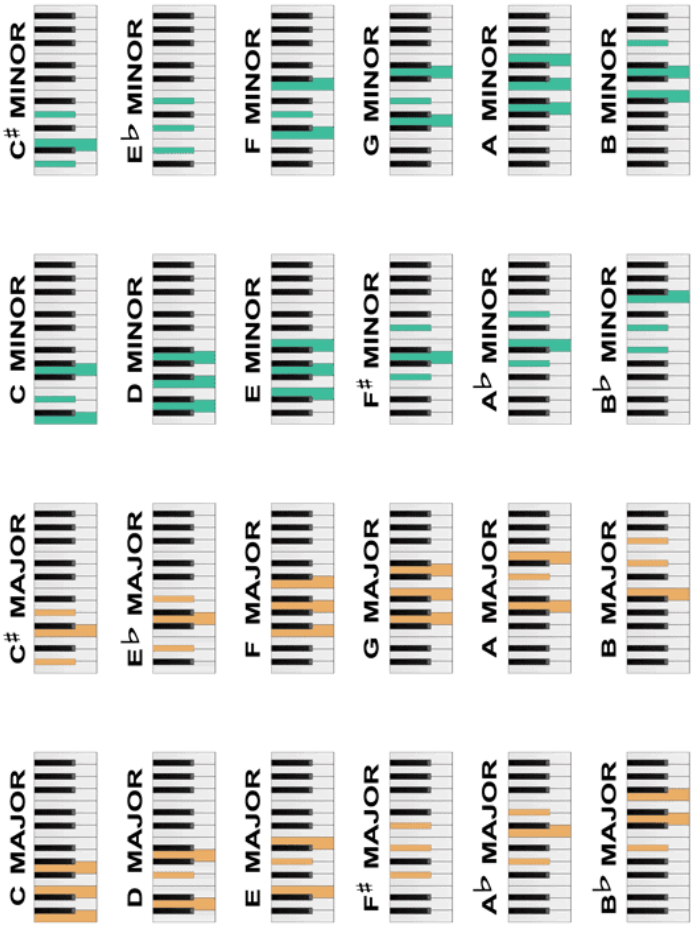


Minor Chords. Do the same steps as for major chords but move the 3rd 1-semi tone down (flat).

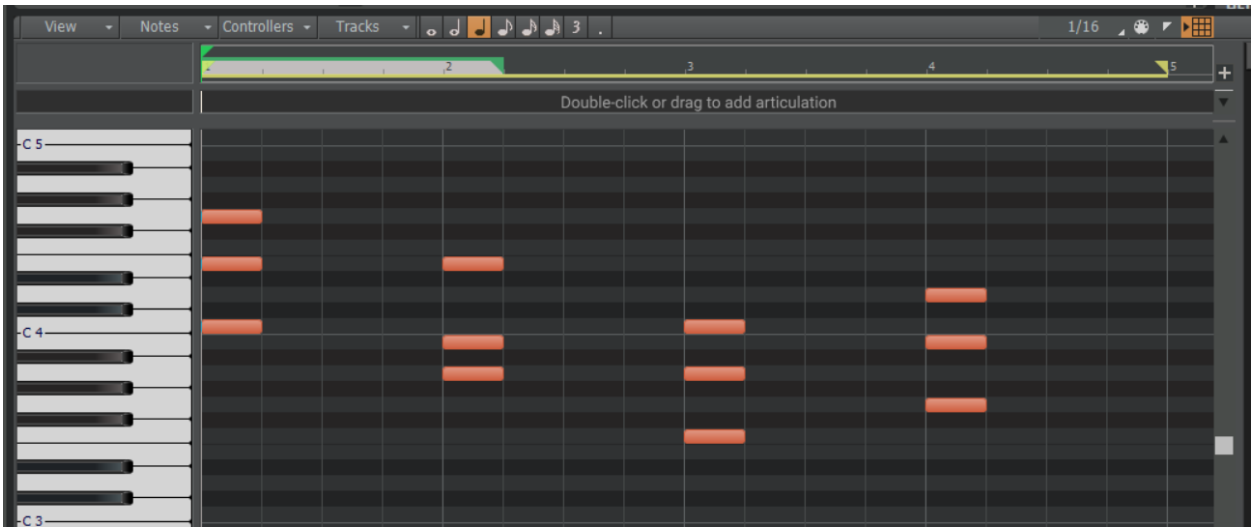


In short, use the 1-3b-5 pattern. Minor is marked with "**m**". Example: **Gm, C#m** (C Sharp Minor).

Here is a chord chart from https://www.skoove.com/blog/piano-chords/. It's rotated to easily translate to Cakewalk's piano roll.

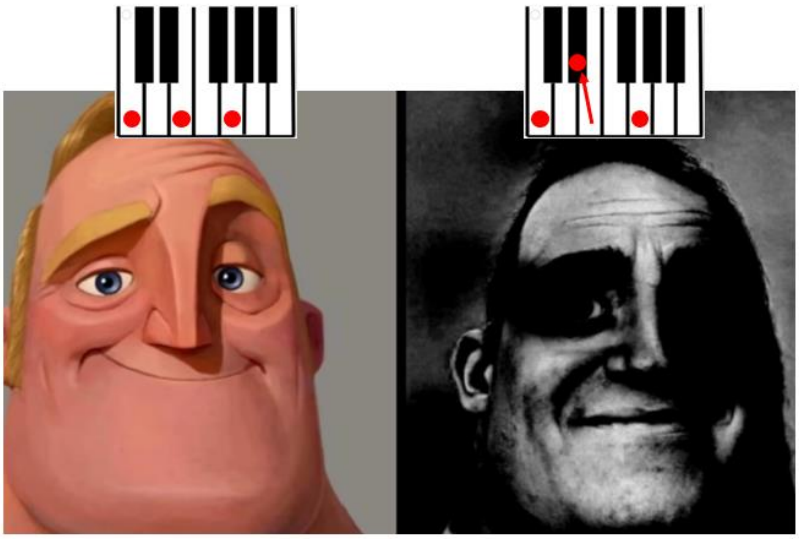


Below is a 4-chord progression in Cakewalk's piano roll. C4, Am (root on A3), F3 and G3. Each chord is programmed at first beat of each bar.



On an emotional level, major chords tend to sound bright, while minor chords sound darker.

Check out this short description of the emotional personality that goes with each of the different keys:



- **C:** Innocence, happiness with a spiritual feeling.
- **Cm:** Innocence, sadness, heartbroken and evokes yearning.
- **C#m:** Passionate and deep, evoking sorrow, grief, despair, and self-punishment.
- **Db:** Depressive masked by an air of happiness. Evokes feelings of grief and despair.
- **D:** Triumphant and victorious. Feels like war marches or holiday songs.
- **Dm:** serious and melancholic. Brings on feelings of concerns and contemplation.
- **D#m:** Deep and anxious, evoking feelings of distress, terror, darkness, and hesitation.

- **Eb:** This key brings on feelings of cruelty, but also devoted love, openness, and intimacy.
- **E:** Dissatisfaction and a ready-to-fight feeling – but also joy and delight.
- **Em:** Restless love, grief, and mournfulness.
- **F:** Optimism and the will to explode.
- **Fm:** Dark and funereal, evoking feelings of the deepest depression, death, loss, and misery.
- **F#:** Conquest, relief, triumph, victory, and clarity.
- **F#m:** Resentment, discontentment, and lamentation, but with a touch of hope.
- **G:** Happy, but with serious overtones, idyllic, and poetic. This evokes calm, satisfaction, tenderness, gratitude and peace.
- **Gm:** Feelings of discontent, uneasiness, failure, concern, and struggling.
- **Ab:** Death, eternity, judgment, darkness.
- **Abm:** related to wailing, suffocation, lamentation, struggle, and negativity.
- **A:** Brings feelings of joy, reciprocated love, satisfaction, optimistic, trust, and spirituality.
- **Am:** Sad, but with tenderness.
- **Bb:** Joyful and cheerful, with feelings of love, consciousness, hope, optimism, and peace.
- **Bbm:** Feels like the night, darkness, blasphemy, death, and destiny.
- **B:** Feelings of strength, wildness, passion, jealousy, fury, negativity, and the will to fight.
- **Bm:** Solitude, melancholy, patience, calm, submission, and acceptance.

These are just a couple of examples of how major and minor chords can create mood and emotion, both expected and unexpected.

V. PRACTICE

Find a song, look for its meter and tempo and find the chords used in it. Use Cakewalk to program the song chords.

12 Easy Guitar Songs You Can Play with Just 4 Chords

- 1) "Don't Stop Believin" - Journey.
- 2) "With or Without You" - U2.
- 3) "Soul Sister" - Train.
- 4) "Let it Be" - The Beatles.
- 5) "Already Gone" - Kelly Clarkson.
- 6) "I'm Yours" - Jason Mraz.
- 7) "Take Me Home Country Roads" - John Denver.
- 8) "Cruise" - Florida Georgia Line.

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https://www.derekwilliamsguitar.com › post › 12-easy-gui...

VI. SUMMARY

We learned how music theory is applied inside a DAW. We also learned how to lay down notes and chord patterns on the tracks. Chord patterns have emotional impact on the listeners and storytelling.

You may not be a musician but with virtual instruments (VSTs) you can create music programmatically using the piano roll.

The notes created in the piano roll are known as MIDI notes, which can be exported as file and can be used on other programs.

In the next lesson, we'll dive more into recording virtual instruments in Cakewalk.

VII. REFERENCES

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