Chapter 0: Key signatures.

The key signature theory.

As explained in previous chapters: the most commonly used music scale in the Western world is called the major scale. The structure of a major scale is: 2 whole steps, half step, 3 whole steps, half step.

When you start a major scale on the note C (do), you get the notes C D E F G A B.
This corresponds to the 7 white keys on a piano. The white keys just have alphabet note names, and these notes are also called the “natural notes’. C major scale is the ONLY major scale that has no sharp (#) or flat (b) notes: only “natural” notes.

But there are also 5 black keys on the piano.
A black key on the piano is either called # (sharp) or b (flat).

These are the notes that fall in between the notes

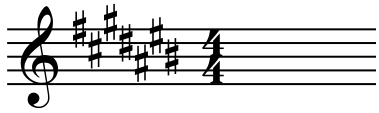
1) C and D (C# / Db),
2) in between D and E (D# / Eb),
3) in between F and G (F# / Gb),
4) in between G and A (G# / Ab)
5) in between A and B (A# / Bb).

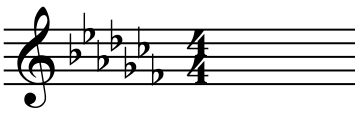
Since C is the only major scale that has no black keys, that means that the major scales started from any of the other 11 notes, all must have at least 1 sharp or flat (meaning: a black key).

Hence: key signatures…

A key signature **signifies a key.**
A key signature places the accidentals of various scales at the beginning of the staff. The key signature is always placed at the beginning of a piece of music, right after the clef and before the time signature.

It looks like this:





With the key signature placed at the very beginning of a piece of music, the musician knows right away what scale the song is written with that he is about to play. This makes it easier for the performer to sight-read the piece of music, because he knows what the notes are that is going to be dealing with throughout the piece, before he starts playing.
He knows what to expect and is better prepared to perform the piece more accurately.
By having the key signatures for all major scales memorized, through practice you will over time memorize the notes in the other 11 major scales.

Though the structure is always the same for a major scale, each key has a certain unique tonal color. Music written with an A major scale for example has a more vibrant, lively color, whereas music written with an Eb major scale, is generally agreed to have a more warm, more "soft-spoken" color.

It requires a well-developed ear and sensitivity to hear these differences.
It has been debated that Bach, Beethoven or Mozart for example did not choose the key of a composition they were about to write by accident or coincidence. They deliberately chose the scale color that they found best expressed and represented the feel they wanted to convey in the music.

Each key signature signifies a scale.

Example 1:

A major scale starting from F gives following notes:

F G A Bb C D E F

In the key of F, in order to maintain half steps between 3-4 and 7-8, the 4th note B is flatted to Bb, securing a half step above 3rd note A.

That 1 flat "signifies" the key of F. It is its "signature" so to speak.
There is only one major scale that has 1 flat, and that is an F major scale.

Example 2:

G major scale has following notes:

G A B C D E F# G

In the key of G, in order to maintain half steps between 3-4 and 7-8, the 7th note F has to be raised to F# in order to half a half step between 7 & 8.

That 1 sharp "signifies" the key of G. It is its "signature" so to speak.
There is only one major scale that has 1 sharp, and that is a G major scale.

In other words: a key signature is a number of sharps or flats.

Since a scale has 7 notes:
From 1 up to max 7 notes can be raised: 1 – 7 sharp (1#, 2#, 3#, 4#, 5#, 6#, 7#)
From 1 up to max 7 notes can be lowered: 1 – 7 flats (1b, 2b, 3b, 4b, 5b, 6b, 7b)

There is one major scale that has no sharps or flats. You already learned that scale: the C major scale.
This adds up to 15 possible key signatures.

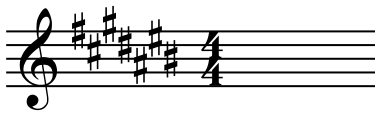
A key signature tells for its corresponding major scale, how many notes that scale is different from the C major scale (the scale that consists of white keys only).

The order of sharps and the order of flats.

Memorize following lines:

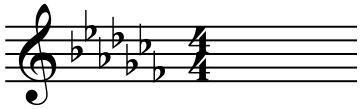
1) **The order of sharps**

F# C# G# D# A# E# B#



2) **The order of flats.**

Bb Eb Ab Db Gb Cb F(b)



Notice how the order of #'s is the order of b's backwards, and vice versa.
The sharps go up in 5ths.
The flats go down in 5ths.
This sequence in 5ths is the result of the *cycle of 5ths,* which is covered in a later chapter.

What does this mean: "order of…"?

You want to memorize both these lines, because you will be using them to figure out and to memorize what the notes are in all 12 major scales.

Now, the "order of sharps" means that the sharps always happen in that order:

- A scale that has 1 #, that note is F#
- A scale that has 2#'s, these notes are F# and C#
- A scale that has 3#'s, these notes are F#, C# and G#,

And so on.

Same for the order of b's:

- A scale that has 1 b, that note is Bb
- A scale that has 2b's, these notes are Bb and Eb
- A scale that has 3b's, these notes are Bb, Eb and Ab,

And so on.

Which scales use b's and which use #'s?

You use the order of #'s for scales that start on **WHITE** keys:

1) G major,
2) D major,
3) A major,
4) E major,
5) B major

2 exceptions: F# major and C# major scales

You use the order of b's for scales that start on **BLACK** keys:

1) Bb major,
2) Eb major,
3) Ab major,
4) Db major,

5) Gb major,
6) Cb major

1 exception: F major scale (starts on a white key, but has 1 flat)

How to apply this to learn all major scales?

This is where things can get a bit tricky.
Following explains a system that will enable you to memorize what the notes are in all 12 major scales using the order of sharps and the order of flats.

You either will be

1) **Trying to figure out the key signature (the notes in a given scale),**

This would be the case for example when you jam with friends and they say: "let's jam in the key of A". You need to know what the notes are in that scale so you can play solos and interact with your friends musically.

2) **Trying to figure out the scale (based on a given key signature).**

This would be the case when you want to learn a song from sheet music, and you need to know what scale the song is written in when you see the key signature at the beginning of the piece.

Even if you are not interested in learning to read music, this information is still helpful. Knowing how to apply this information will for example make it easier for you learn new songs. The more you know about music, the more connections you see, and the less you have to rely upon memory when trying to learn a new song.

So here's how to apply the order of sharps and flats…

- ***For scales with sharps:***

1) Apply following trick when you know the key signature and you try to figure out what scale corresponds to that key signature (learning a transcribed song):

   Whatever the number of sharps, take the last # in line → Go up a ½ step from there = the key

   Example :
   When there's 3 #'s → they are F#, C# and G# → last # in line is G# → up a ½ step from G# = A (major scale).

   Conclusion:
   A major scale has 3 sharps (meaning: black keys F#, C# and G#.)

2) Apply following trick when the key is a given. (When in a jam session with musicians, somebody names a key, and you try to figure what the key signature is, meaning: what the notes are)

   Go over the line of #'s → stop on the sharp that is a ½ step down from the key you are looking for. That one is the last sharp in line. Count the number of sharps up till there.

   Example:

Key of A → order of #'s is F#, C#, G#... bingo → this is the sharp a ½ step lower than the key.

Conclusion:
A major scale has 3 #'s: F#, C# and G#.

- ***For scales with flats:***

1) Apply following trick when the key signature is a given and you try to figure out the scale: (learning a transcribed song)

   Go back 1 flat: the one before the last b in line → = the key

   Example:
   2 b's → they are Bb and Eb → the one before the last b is Bb → = the key (scale).

   Conclusion:
   Bb major scale has 2 flats (meaning: black keys Bb and Eb)

2) Apply following trick when the scale/key is a given and you try to figure out the key signature. (Jam session with musicians),

   Go up to the b with the same name of the key that is given→ then go 1 flat further (add the next flat)

   Example:
   Key of Ab → order of b's is: Bb, Eb, Ab *(Which is the key we're looking for).*
   Go 1 flat further, which is Db.

   Conclusion:
   Ab major scale has 4 flats (Bb, Eb, Ab and Db)

Caution!!!

1) A scale that has 6 sharps: the 6th sharp is E#. A half step up from E# is F# (Not F: F major scale has 1b, not sharps)

2) The 7th sharp in the order of #'s is B#. Up a half step from B# is C#. C# major scale has 7#'s.

3) You want to think of the "order of sharps" and the "order of flats" as continues lines. Hence: for the order of flats, if you only have 1 flat, the "one before the last flat" would be F. F major scale has 1 flat in the scale (Bb).

4) The major scale that has 1 flat is F major scale. (Not Fb. Notice how in the order of flats, the last flat is in between parenthesis. Fb is the 7th flat in the order of flats, but the scale you get is F when you take the 1 before the last flat, preceding Bb)

Helpful tips!

A) Enharmonic scales/notes.

"Enharmonic" means different note names for the same sound (Eb and D#, F# and Gb, B and Cb, etc…).

The key signatures of enharmonic scales ALWAYS add up to 12.

Examples:

C# = 7#'s ------- Db = 5b's = 12 #'s and b's

Cb = 7b's ------- B = 5#'s = 12 #'s and b's

Gb = 6b's ------- F# = 6#'s = 12 #'s and b's

Ab = 4b's ------- G# = 6#'s + 1 ## (double sharp) = 12 #'s and b's

B) ½ step apart but same alphabet note name.

For scales that are a ½ step apart but sharing the same note name (A & Ab, F & F#, B & Bb, etc…) → their key signatures ALWAYS ad up to 7

Examples:

C = 0 b's → Cb = 7b's = 7
A = 3 #'s → Ab = 4 b's = 7
F = 1 b → F# = 6 #'s = 7
G = 1 # → Gb = 6 b's = 7
D = 2 #'s → Db = 5 b's = 7
Etc…

How to practice key signatures.

Make 2 stacks of flash cards:

1) Zero #, 1#, 2#, 3#, 4#, 5#, 6#, 7#, Zero b, 1b, 2b, 3b, 4b, 5b, 6b, 7b
2) C, C#, Db, D, Eb, E, F, F#, Gb, G, Ab, A, Bb, B, Cb

With the first stack of flash cards, you practice
how to figure out the scale, based on a given key signature.

With the 2nd stack of flash cards,
you practice how to figure out the key signature to a given scale.

That way you will memorize in either direction what the notes are in all major scales, and what the major scale/key is that you are dealing with when you see a grouping of notes.

Go through each stack of flash cards, and apply the above explained practice systems.
Practice this for about 3 minutes per stack of flash cards, about 3-4 times a day.

How to efficiently figure out the white keys in a scale with lots of #'s or b's.

Sure you could count all the way up the order of sharps or the order of flats to find out which notes did not get sharped or flatted, but there is a faster and easier way.

Use the knowledge that: “the first flats are the last sharps” and vice versa.

The order of sharps is the order of flats backwards
The order of flats is the order of sharps backwards.

Sharps: **F C G D A E B**
Flats: **B E A D G C F**

A scale with 4 sharps has the 3 last letters in the order of sharps as white keys. These 3 letters, A, E and B, are the first 3 flats. It is faster (read: more efficient) to count the first 3 flats, than to have to count all the way till the end of the order of sharps to figure out what the 3 notes are that did not get sharped.

Conversely:

A scale with 5 flats will have the last 2 letters in the order of flats as white keys. The last 2 flats in the order of flats are C and F. These are also the first 2 sharps. It is faster (read: more efficient) to count the first sharps, than to have to count all the way till the end of the order of flats to figure out what the notes are that did not get flatted.

Use this information to your advantage to figure out faster what the white keys are in scales with lots of sharps or flats.

Examples:

1) The key of Db has 5 flats. The white keys (2 notes that did not get flatted, last 2 notes in order of flats) are F and C: also the first 2 sharps.

2) The key of B has 5 sharps. The white keys (2 notes that did not get sharp’d, last 2 notes in the order of #’s) are B and E: also the first 2 flats.

One of the benefits you get from this little piece of trivia is “awareness”. You get scales down on a deeper level in shorter amount of time, if you’re not only aware of what the key signature is of the scale, but also of what the notes are that are NOT part of the key signature (the white keys).