The sequential ordering of events in memory, numbered through $\vec{\mathbb{N}}$, which gives ***direction*** *FORWARD*, is defining the ***causal action*** for us.
The concept of Time must obey a ***primary quality***, the ***causal action***.
Put in a simple word, *FORWARD*.
We say that time has a forward ***direction***, as shown by the arrow in the count
$\vec{\mathbb{N}} \equiv 0, \overrightarrow{1,2,3,4,}$ .... The count is a ***causal action***.
Often the ***causal action*** is called for The Arrow of Time. – Here it is: The Arrow of Times.
The Arrow of Times has no ***direction*** in the traditional natural space and the causal ***direction*** is called a pure ***primary quality*** for the concept of Time.
When we count the natural numbers, the individual numbers are **no *quantity***. E.g.
When we count the number 3, the number 2 disappeared in the past, and we expect 4.
It is also impossible to judge whether the present 'NOW' is big or small. (**no *quantity***)
The count itself (the natural number) has no magnitude.

1.3.2.1. Extension of Time

The idea of extension in the concept of Time is a *secondary quality*.[14]
I claim exactly, that the experience of the extension of Time is a religious experience.
I will be compelled to say that Times has no extension (in space), and that time is not the reason why something happens. However, when something happens causes, why we experience time.
The events mean that we experience and interpret sequential perceptions as time, experienced as a *secondary quality*.
The only reason we know that time is, is to remember the past and that there are *constantly*[15] *persistent* new elements to memory.
To the future, we can only guess from the memory of the past.

1.3.3. Quantity in Time

The idea of a time quantity depends on a process of counting the number of oscillations in a rhythm. The most widely known time quantum is the rhythm of the beating of our own heart and the more technical tock from a pendulum clock.
We count the time forward, as above, in the sequence: ... 1, 2, 3, 4, ...
In the causal action number 1 persistently is added sequentially, as follows:

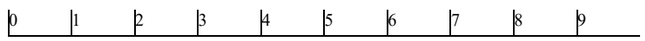
$$0 + 1 = 1, \quad 1 + 1 = 2, \quad 2 + 1 = 3, \quad 3 + 1 = 4, \ldots$$

Anyway, we can count backwards ... 4, 3, 2, 1, 0, ...
Instead, we subtract 1 all the times, as: ... $4–1 = 3$, $3–1 = 2$, $2–1 = 1$, $1–1 = 0$ ...
We can describe the backwards counting process by the sequence:

$$i_n = i_0 - n, \quad i_n \in \mathbb{Z}, \quad n \in \vec{\mathbb{N}}$$

The fact that we count rhythm backwards does not imply the time to go backwards. To read this text line from right to left, nor make the time go backwards, although the text causal content changes. Anyway, your reading ***direction*** is still *FORWARD* in your ***causal action***.

1.3.3.1. The Passage of Time



You draw a timeline or time axis, where the figure marks along the axis correspond to the counting rhythm sequential timing numbers as a *FORWARD* that forecasts future times.
Let us just start at 0 (zero) to count forward in a positive orientation on the number line.

[14] The Christian philosopher Augustine dealt with the extension of Times starting from creation over Christ until doomsday (Creation as the reason). This is considered here as a religious attitude, that we will not deal with here.
[15] The name *constantly* refers here to the NOW as a process concept. (*persistently* may be better than *constantly*, to avoid *eternally*).

When we counted, for example. 5, we can remember that we counted 1, 2, 3, 4, and 5.
We consider the passage of time positive. We can also look at a number that represents the future e.g., 9 and count backwards along the number line in the negative orientation. The timeline ***direction*** is drawn in space, and in space, we can alternate the orientation of ***direction*** without violating causality. The times from an imagined future counted to the event we remember may appropriately be considered negative,[16] but our process to keep on (counting forward) to a future point, always goes causally *FORWARD*.
Keep in mind; for the concept of Time, the ***primary quality*** is ***causal action***. Remember:
To count backwards along the timeline is backward in space, but *FORWARD* in the concept of Time. Time has ***direction*** but its orientation has no meaning in physics.
Time can only go forward never backwards. I.e., an imaginative journey through time to the past can never be done in reality. Of course, you can travel backwards through space, but keep in mind the return ticket! When travelling forward again through space to return to the original place, the journey time is doubled, and the past path is only your memory of your trip.
The timeline helps to illustrate the time events as location points with numbers in sequential order $\vec{\mathbb{N}}$, and thus the ***causal action*** *FORWARD*. The ***direction*** of time is often illustrated as the ***direction*** of reading. Anyway, the timeline is an illusion, because the ***direction*** of the ***causal action*** *FORWARD* always is orthogonal to space and can never be projected into physical space by geometric methods. But anyway, we can draw a timeline as a *display* for our intuition parallel to any ***direction*** through natural space, e.g., as a line on paper with marks for events.

1.3.4. Speed of Times, the Quantum of Time, and the Frequency

How fast is the time? How fast is the rhythm we count? Our hearts beat about once per second (maximum three). A typical pendulum clock has one tock per second like a quartz clock gives a mechanical notch at each second (1 Hz). The basic ***quantity*** is the count number 1 (one).
We count one, and one more and one more, etc. ...
The speed in the concept of Time is the rhythm with which we count.
We call this the frequency f. Of What? We must choose a specific ***entity*** as a clock in physics.

We measure frequency f as the number of oscillations n_u per unit of time t_u: $f = \frac{n_u}{t_u}$

The time unit t_u is here (paraphysical) defined as a self-referring argument: $t_u = \frac{n_u}{f}$

For this, we provide a number for the clock time t_c, as the ratio between the count numbers of oscillations (tocks) n_c and the frequency f_c of the clock: $t_c = \frac{n_c}{f_c}$

The common time unit is 1 second. One second has since 1967 been defined as the duration of 9,192,631,770 oscillations of the radiation between the two hyperfine levels of the ground state of the Caesium atom Cs_{133}.

Here, the frequency is: $f_{Cs} = 9{,}192{,}631{,}770$ [Hz]
We count to: $n_u = 9{,}192{,}631{,}770$
Thereby one second just defines as:

$$1[s] = t_u = \frac{n_u}{f_{Cs}} = \frac{9{,}192{,}631{,}770}{9{,}192{,}631{,}770\,[Hz]} \qquad (1) \tag{1.8}$$

Here the microwave radio frequency 9.2... GHz can easily be counted electronically.
When we counted to $n_u = 9{,}192{,}631{,}770$, we have one second. In the Caesium atomic clock, the radio wave oscillation determines the speed of times in the clock, with the frequency f_{Cs}. –
The speed of counts is what we call frequency.
The count $n_c \in \vec{\mathbb{N}}$ is the basic ***quantity*** of the concept ***quality*** of times (perceived as Time).

[16] An example of a negative time interval is $t_1 = 9 \;\wedge\; t_2 = 5 \;\Rightarrow\; \Delta t = t_2 - t_1 = -4$