https://www.humanbenchmark.com/tests/reactiontime

The website measures how fast the user reacts to a visual signal. The user **has to click** when a red box turns green. **Response** time is measured in milliseconds. This is part of a website called **Human benchmark** which **provides** 4 cognitive tests to get **your** "brain score".

When you load the page, a blue screen is displayed and prompts you to click on its frame to start the test. The screen then turns then to red and asks you to wait for it to turn green before clicking again. The time between the moment the screen turns green and the moment you click is recorded and may be saved, should you sign up on the website, but even without doing this, what is interesting is that you can see by scrolling down the page several rankings and statistics based on the reaction times of former players who tried this before. You may thus compare your score and see whether you are below or above the average.

You may wonder how time is handled as such by the website, and to understand this you must display the source code of the page by pressing simultaneously keys Ctrl, Shift and I (capital i). You will see snippets of code enclosed by the keyword <script>: these are mainly Javascript code which, once executed on your machine when your browser loads the page, does whatever it takes to manage time. No matter how this code works, what is certain is that without it the page would be static, that is it would only display colours, texts and other things without being able to interact with the user or to do any processing that would manage time.

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http://popsauce.sparklinlabs.com/

PopSauce is a multiplayer game that tests players' pop culture. In this game players have 15 seconds to identify a picture or a quote that comes from a movie or a music. **The first player who guesses** the reference scores 5 points, the next player who guesses after that will score fewer points. Javascript enables the programmer to code this game.

You can find the same timer technology in **CodeRoute**

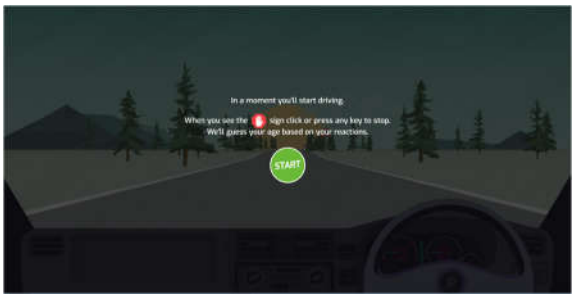
http://www.coderoute.com/test-code-de-la-route/

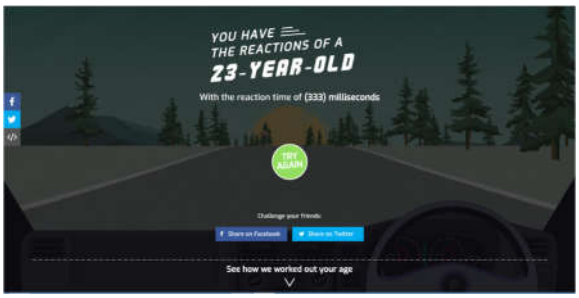
in which users have 30 seconds to give their answers.

---

https://www.justpark.com/creative/reaction-time-test/

This website **allows you to test your reaction time** while driving and **it shows you, from your** results, a predicted age by using a graph displaying for each age what the average reaction time is. If **your results** are under the minimum reaction time referenced in the graph it will tell **you**:
“We’re not sure if you’re an actual human being”.





Justpark tests user response time in milliseconds. It depicts a car driver going along a straight road, and when the red sign appears, the user must click on the screen to stop the car. The response time is then calculated and the application uses this to determine the age corresponding to reaction time. The longer the time, the greater the determined age will be too. The average (median) reaction time is 215 milliseconds, according to data collected so far. In addition to measuring your reaction time, this test is affected by the latency of your computer and monitor. Using a fast computer, wired mouse, and low latency / high frame rate monitor will improve your score somewhat.
The timer system is initialized by means of a function contained in a Javascript library, as can be seen in the source code on the page :

```
<!-- Google Tag Manager -->
<noscript><iframe src="//www.googletagmanager.com/ns.html?id=GTM-5RHQ7J"
height="0" width="0" style="display:none;visibility:hidden"></iframe></noscript>
<script>(function(w,d,s,l,i){w[l]=w[l]||[];w[l].push({'gtm.start':
new Date().getTime(),event:'gtm.js'});var f=d.getElementsByTagName(s)[0],
j=d.createElement(s),dl=l!='dataLayer'?'&l='+l:'';j.async=true;j.src=
'//www.googletagmanager.com/gtm.js?id='+i+dl;f.parentNode.insertBefore(j,f);
})(window,document,'script','dataLayer','GTM-5RHQ7J');</script>
<!-- End Google Tag Manager -->
```

The site calls on the function **getTime** to trigger the event **gtm.js**
I think this event reads the current time and when you click on a key, calculates the difference between the two moments.

---

https://www.online-stopwatch.com/world-games-running/
This website link is a **game for gambling** with friends. There are 4 runners in a race and the winner is picked randomly. It is like a PMU but without horses. You have to set a time before the race gets started. You choose one player from 4.
The timer part is coded in Javascript in the source code.
There are several games like this, but in some of them, you can choose more or fewer players
https://www.online-stopwatch.com/robot-race/
https://www.online-stopwatch.com/spaceship-race/
https://www.online-stopwatch.com/world-games-swimming/
https://www.online-stopwatch.com/duck-race/

---

https://faculty.washington.edu/chudler/java/redgreen.html
This website allows user reaction time to be tested with a traffic light. You can test your reaction three 5 times. The programme calculates an average user response time. The aim of this game is simple. You have to click on a large button to start the stoplight so that it will turn green. Then you have to wait for the stoplight to turn green and click the large button again and your response time will be registered.
This programme is developed with JAVASCRIPT and it can be useful for drivers to analyse their reaction time calculated in milliseconds.

---

http://test.prise2tete.fr/aptitude-temps-de-reaction-et-couleurs.php
The « *Test Aptitude: Temps de réaction (Reflexes) et couleurs* » website measures user response time in milliseconds to a visual stimulus. It trains you to have a better reaction time which can be really useful to be better at videogames in a competitive way. To start the test, you need to click on the square and wait until it changes its colour. When the colour changes, you need to click fast. At the end, you get your average score for each colour.
To develop this « game » they used JavaScript.

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https://www.memrise.com/home/
Memrise is a website which lets you learn many languages like English Japanese and French. The tests on this website use time to limit response time of the user but not to measure it. JavaScript or C# can be used on a website to measure the response time of users. In video games the technology used to measure this timing depends on which support games are released. It can be in JAVA, C++ or others.

---

http://bombparty.sparklinlabs.com/

Repeating systems like web applications and videogames include **an internal clock that counts time** in seconds. For their processes, apps use timing **by means of** an internal clock. Usually time is calculated from UNIX time **which** is an international clock started on January 1st 1970. The date is an integer, which is incremented each second and then calculated to show the actual date on the system. The timer then converts UNIX time into milliseconds between the two dates and compares them to a value in the **programme** to launch scripts in the app.

One example is the **browser game BombParty** which is useful to understand. BombParty is a multiplayer game where a bomb is targeting a player. The player must then write a word with a given syllable in it (e.g; The game gives you "IVE", you must type a word like "FORGIVE"), then the bomb targets another player, forcing **them** to write another word with a given syllable until the bomb explodes. At the beginning of the game, the timer in the bomb is **set to** a value by the master of the game, then the value decreases as a timer by comparing it from the date when the game started. Another timer can be used to prevent the bomb from exploding instantly after a player has been targeted by the bomb to give **them** the chance to respond before losing. This timer has a priority over the first. But if both timers are at 0, the player currently targeted loses a life and the game continues until the last player remains.

---

https://lifecraft.fr/minecraft-click-test-cps-click-per-second

The website **Lifecraft** enables users to test their **CPS** (**Clicks per second**). To test your CPS, **you have to click** as quickly as possible on the rectangle **for 10 seconds**. When the 10 seconds **are up**, the website gives the result in CPS. The timer is managed by Javascript. CPS can be seen as a performance criterion for players.

---

https://www.topquizz.com/quiz/Quizz-de-rapidite-questions-stupides-48585

This website allows users to design a **speed quiz**. All website visitors can answer questions. As well as answering the questions, the quiz enables the user to see their response time and their score. These features give the user their overall rank. To calculate response time, the website uses JavaScript.

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https://www.quizup.com/
The application **QuizUp** is a mobile application available on mobile phones, which **enables** the user to answer quizzes in competition with other people. In this game the user has 10 seconds to answer 1 question and the faster they answer, the more points they will get. If when they answer the question in 10 seconds, the user will win 18 points: if it's 9 seconds they will win 18 points. The score is the time * 2. The player who gets more points than the other wins the game. I think the language is JAVA but I have no access to the source code to check it.

---

http://www.pinturillo2.com/
Pinturillo is an online pictionary video game where you have to draw to make someone guess a word or you have to guess a word according to someone's drawing. Firstly, you have to choose the language for the game. Secondly, you have to choose a nickname. Then, you can choose to play with your friend or join a public room. When you arrive in a public room, you have to wait your turn to draw but you can guess the word that someone draw.
When someone draws, there is a timer that allows the score to be calculated for the people guessing. If you have 45 seconds left when you guess the word, you win 45 points. At the end of 3 turns, someone has won.

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https://typeracer.com/
This measures the time you take to write a text on your keyboard and puts you in competition with other users.

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https://www.dactylocours.com/test.php and https://www.typingtest.com/test.html?minutes=1&textfile=aesop.txt.
These sites test speed and rapidity in keyboard typing. Both applications show a sentence and when you have write this sentence, they show you your CPM (number of characters you type per minute) and your time in seconds. The results between the time and correct answers (CPM) allows the applications to set up ranking between players. These applications use JavaScript to develop this timing function.

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http://fr.joy.land/super-mario-bros.html
This website is for playing Mario Bros. The game features the plumber Mario who, along with his brother Luigi, has to fight the creatures coming from the sewers. The goal of the game is to eliminate all the enemies present in the level, level by level, by scoring the maximum of points and trying to go as far as possible. It's necessary to finish the level before the allotted time. The remaining time gives more points, if time is up, you lose a life.
The timer part is coded in JavaScript.

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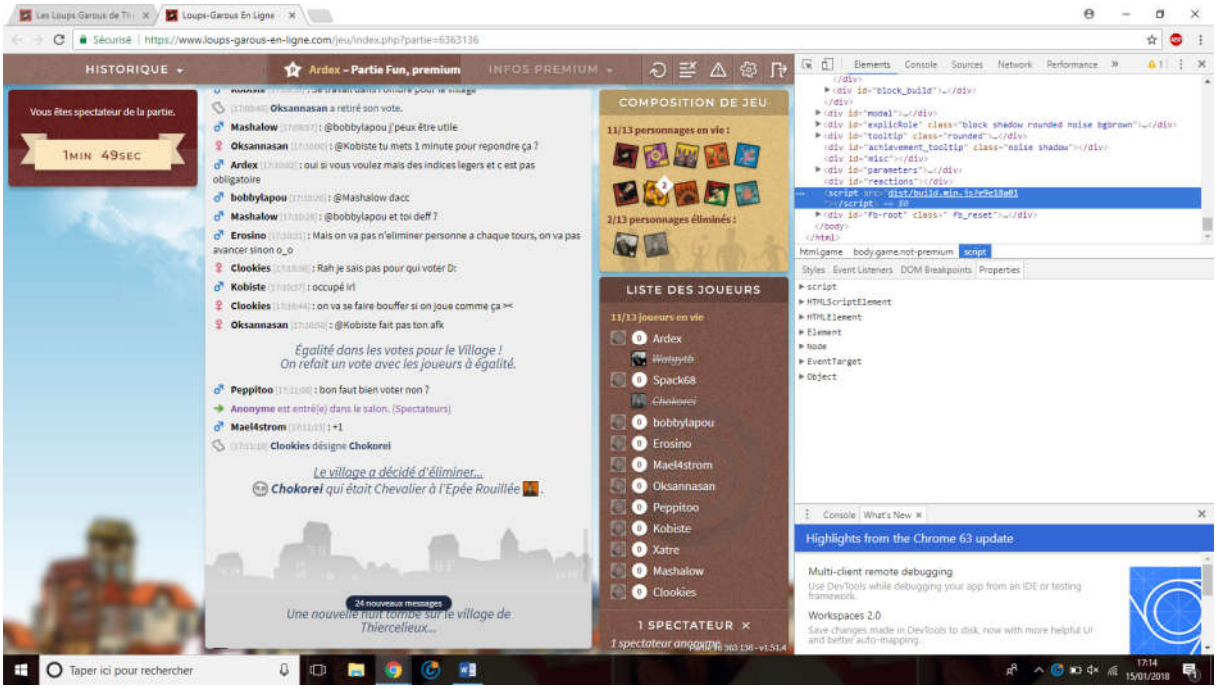
http://www.mon-qi.com/tests-de-qi.php.

This IQ test uses timer technology. When you start a test, you have 45 seconds to answer each question. The time decreases with the timer which is used for several things: to change the question if the time reaches 0, and it is also used in the calculation of the test result. If you answer quickly, your result will be high. The language used in this application is JavaScript: every second, a function is called by the timer.

The website « *Les Loups-Garous de Thiercelieux* » uses timing. During this game each player incarnates a role as a werewolf or person. Each group of characters plays one after the other. So to avoid problems the site implements a system of timing to keep control of the game's flow.

You imagine you are a wolf. When your turn begins, you have 30 seconds to choose a target. How does it work? It's easy. When the turn begins, the server for the web site use JavaScript code to launch a timer of 30 seconds (see the right of the picture). When time is up, the script stops its execution and sends a message to the server that the turn is finished. But this has a defect, because the timer is placed on the server so if there are any connection problems, the player may not play his turn.

The script is a simple script. The server gives it the maximum time to play according to the player's role, and if that player does not play by the end of the timer, their turn is over.



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https://fr.chesstempo.com/play-chess-online.html
Time is very important when playing chess to explain why you must choose the kind of game you want. There are 4 types of chess games:
- Fast games: 15 to 60 minutes per player.
- Blitz games: less than 15 minutes per player, (usually 5 minutes).
- Bullet games: 1 to 3 minutes per player.
- Lightning games: less than 1 minute per player.

The timer here does not allow players to think too long. Timing is a way to put pressure on the players because you have to manage it in order to win because once your personal timer has fallen to 0 you have lost even if you took more pawns from your opponent. This time system makes it possible to see the speed in responses to different situations. Failures therefore not only let our analytical mind work but also our speed of decision-making.
How to use this site: Click on Play without an account. To create a game, you need to click on "create a challenge" Now you can choose how much time per player you want and just wait for another player for a few minutes.

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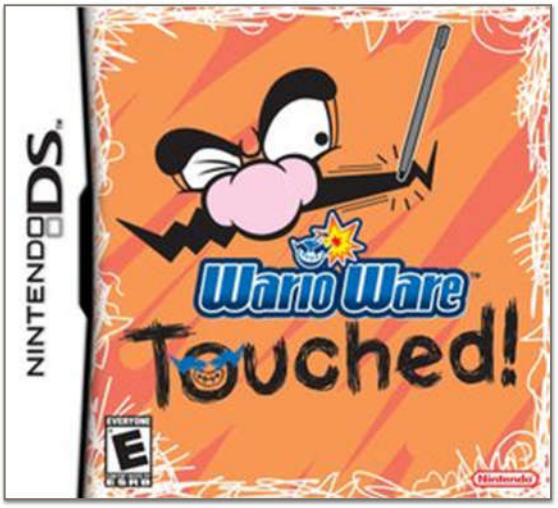
http://www.94seconds.com
This application is a test in which users answer questions about general culture. It is essentially designed for young people but all people who have a smartphone can use it.
The game proposes a letter and users will find a word, which begins with this letter, and corresponds to the requested field (animals, plants, fruits, countries, capital cities, sports, colours…). It lasts 94 seconds but users lose 3 seconds if they choose another question. This test judges the speed and the vocabulary of the player. They can therefore practice speaking English with basic words to improve their level.

---

http://www.brainmetrix.com/reflex-test/
On the website **brainmetrix,** there is a reflex test by a grid. The reflex test starts when you click ok on a message box after you click start and for 60 seconds. The objective is to click on the green buttons as fast as possible. If you take too long or miss the right green square the colour will change to red exactly on the square you incorrectly hit. A green square changes even if you do not click. And you can change the speed of changing green squares. When the time is up, the website displays the user's score under the grid and displays a message box with a score of 60 and the number of mistakes.

WarioWare: **Touched!**



https://youtu.be/AAcGkRqzdY0?t=531

WarioWare: Touched is a Nintendo DS game. The game contains micro-games based on touching the touch screen with the stylus. Players play a grouping of short minigames (called « microgames »). You have to win each microgame within a small time limit and a very brief set of instructions. Each time you win, the game speeds up the microgame, thus shortening the time and making it more challenging and pressuring to complete the microgames within the time limit.
Response time measurement is probably handled by a function which is part of a C++ standard library. If you have access to the source code, you can insert pairs of calls to this function to measure the elapsed time between specific actions.

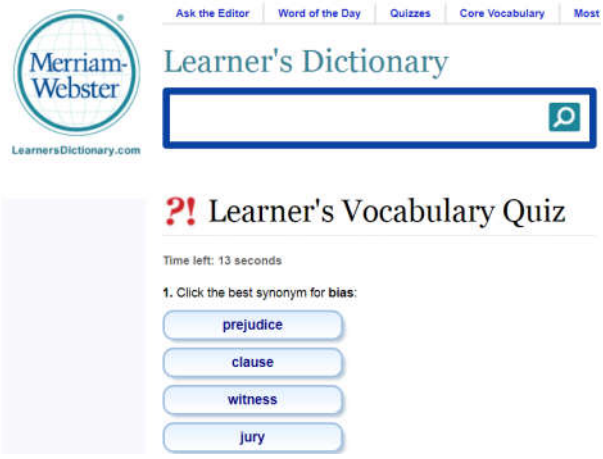
Example of code :

```
#include <time.h>
.....
main()
{
 clock_t start, finish;
 start = clock();
 .
 .
 .
 finish = clock();
 processing time = (double(finish-start)/CLOCKS_PER_SEC);
}
```

---

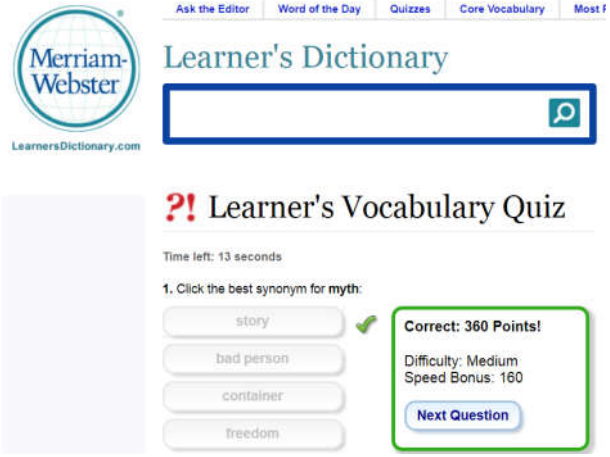
http://learnersdictionary.com/quiz/vocabulary-start

You can access a "Learner's Dictionary" with this link. The quiz is about English vocabulary (see screenshot):



When you have got a correct answer, you get more points.

If you answer quickly, you earn more points with the speed bonus.



I don't know which technology is used for the timer.

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http://www.jeux-geographiques.com/

Cities game page:

http://www.jeux-geographiques.com/jeux-en-ligne-Jeu-Villes-de-France-_pageid39.html

The website is "jeux-geographiques.com". You can play many games about regions, countries, flags and capitals. Games have quite the same principle: you "play against time": for example, for the flags game, you have a city name and you must click on the map where you think the city is. You have to answer as fast as you can to win more points than other players. At the end of the 20 cities. You can see your total points, and your ranking. All games on this website measure user response time.

OpenSesame is a software design by a Dutch team managed by Sebastian Mathôt. It allows you to design psychology, neuroscience, and experimental economics experiments. For example, if somebody wants to prove age effect on inherent learning, they can create a test which will evaluate timing responsivity. Next, the software will give them the result in .csv, that means the software excel can read it. With the results, they can make every calculation that Excel allows, which can mean a lot.

---

http://www.aimbooster.com/

Time response is used on every site that has MCQ or questions with a limited time for the user to answer. Most of the time this timing aspect is handled by JavaScript or PHP.

AimBooster is a game to train your aim in video games. At the beginning, there are two targets per second and as you progress in the game, more targets start to appear. You have 3 seconds to click on the target and three lives. If you miss one target, you lose one life.

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https://www.thebalance.com/automated-day-trading-software-eas-4142824
https://www.quantstart.com/articles/Best-Programming-Language-for-Algorithmic-Trading-Systems
https://www.inforeachinc.com/broker-neutral-trading/high-frequency(Software)

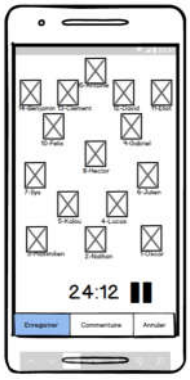
Automated trading software goes by a few different names, such as Expert Advisors (EAs), robotic trading, programme trading, automated trading or black box trading. An automated software is a programme that runs on a computer and trades for the person running the programme.

For people who buy trading software, they are completely dependent on the trading skills and programming skills of the person who wrote the programme. It will require an update from time to time. Market conditions change, and the trading software needs to be updated with it.

A transaction of a High Frequency Trading (HFT) can be ordered in less than 500 microseconds and frequency of orders can reach one thousand orders per second. In order to process the extensive volumes of data needed for HFT applications, an extensively optimised backtester and execution system must be used. C/C++ with some assembler language are likely to the strongest language candidates. Ultra-high frequency strategies will require custom hardware such as FPGAs, exchange co-location and kernal/network interface tuning. Some software also use Java API.

https://play.google.com/store/apps/details?id=fr.francetv.jeux.qpuc&hl=fr
Questions pour un champion is a famous TV show but it also has a mobile game. The principle is to answer questions before the clock runs out. A linear gauge measures the remaining time to answer questions.
This application is coded in Java, so it uses the Java library Timer that allows chronometers or timers to be coded.

In our project, we will have to use a timer for one functionality in our mobile application. When the user starts a match, a timer starts: the team appears on screen with the timer. The user can tap a jock if he scores, gets a warning or is replaced. The timer saves all these events as they are done. This function works by subtracting from the initial date system, the event's system date. This is a screenshot of our future timer use:



TIMING IN COMPUTING

Every operating system includes an internal clock that counts time in seconds. The apps using timing use this internal clock for their processes. For example, on the UNIX operating system, you can get the current date by typing "+ %y - %m - %d - %h - %m - %s", and each variable (y, m, d, h, m and s) will return one "part" of the date (y = year, m = month, d = day, h = hour, s = seconds). To get it in milliseconds you just have to convert it with the instruction "+%3N" which will convert your date into milliseconds, and use this information in your programme.

The clock started on January the first 1970 at 00:00:00 UT for the UNIX operating system and on January the first 1601 at 00:00:00 UT for WINDOWS. This date is called the "Epoch" and the internal clock counts the time from this date: this internal time is called "wall.

Apps that use timing get this internal time and use it to calculate different timings. For example, the MOBAs (a type of competitive video game) uses it to prevent the player from using their ability every time by adding a "cool down time" on it (if you have used it, you can't use it for the next 8 seconds for example).

Timing and response-time measuring

Often times, while using an application or a website, user response-time needs to be monitored. Timing and response-time measuring enhances the application, software or website to keep an eye on the speed at which tasks are being completed which in turn can be used in several ways. For instance, a website offering questions that need to be answered in a set time need to make sure the user isn't taking too long to answer the question as they could look up the answer elsewhere and use the result of their search in the quiz which would defeat the purpose of the website. Those measures can be programmed in several languages and are often made using the internal clock of the computer or the internal clock of the server that the app uses, as such it is relatively easy to use even for a beginner programmer and can have a variety of uses.

Sources :

https://www.ibm.com/support/knowledgecenter/en/SSGU8G_12.1.0/com.ibm.perf.doc/ids_prf_045.htm

http://searchnetworking.techtarget.com/definition/response-time

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Measuring time in websites is a somewhat underused feature, despite having a lot of possible uses. It might become more important as time goes on and people figure out how to apply this technology correctly. For now, an example of this feature is E-learn, a website used by the UPPA to help student learning. It includes the possibility of designing multiple-choice tests with a timer, so students know the remaining time they have to complete the test. It is an interesting feature, but the problem is that it only shows the time remaining for the whole test, and not for the current exercise, so it could be improved in this way.

A general use of user response time is to measure one's skill, either in videogames or in learning. However, there is a different use of user response time, and this is studying people's habits. An example of this usage is Youtube. This website keeps track of how many time people spend on a video, and how much it takes them to click away. This is useful to improve their recommendation system, so that they provide you with videos that could interest you.

Sources:

https://static.googleusercontent.com/media/research.google.com/fr//pubs/archive/45530.pdf

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