



CODING: OUR FUTURE LANGUAGE?

MODULE SUMMARY

#DABEI-Geschichten – an initiative by Deutsche Telekom AG



LIFE IS FOR SHARING.

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FURTHER INFORMATION

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WHAT IS CODING?

Do I need to speak a programming language to help shape the digital world? A question that is increasingly becoming the subject of discussion. Answers to these questions can be found in the following module.

Cooking and Programming

Cooking and programming? – Two activities that do not seem related. Think before you continue reading: What do cooking and programming have in common?

What is Coding?

“Coding” is another word for “programming”. Statements or commands are implemented in coding in a similar way to baking. These commands are translated into a language that a computer understands. The result is the so-called “code” or in other words, the “program”.

The languages required for this are called “programming languages”. Each language has a specific purpose – e. g. for the development of apps or websites.

Pseudocode

Before a program is written in a programming language, many coders use so-called “pseudocodes”. Pseudocodes are structured like codes, but use whole words, sentences and comments for illustration. This makes them easier to understand and suitable for planning new programs.

Machine-Language

Machine language is one of the programming languages that a computer can understand and execute directly. The code of a machine language is called “machine code”. It consists of many ones and zeros. This can quickly become confusing. In addition, each computer needs its own machine code.

Therefore, high-level programming languages are mainly used today. They are similar to human languages and consist of numbers, letters and words. They make it easier for programmers to read and understand the commands. In addition, the codes of high-level programming languages are not limited to individual computers.

However, for the computer to understand high-level programming languages, they must be translated back into machine code. So-called "compilers" are used for this purpose. A compiler is a kind of interpreter that can translate high-level programming languages back into machine code.

Higher Programming Languages

- JavaScript
Even if the name JavaScript sounds similar to Java – these programming languages do not have much in common. JavaScript is used to provide websites with up-to-date information. Weather information that can change every hour is automatically updated at fixed intervals.
- C and C++
C and C++ are two of the oldest programming languages. However, they are still very

important! C++ is the further development of C. Games, but also operating systems such as Microsoft or iOS work with these programming languages.

- Java
Java has been used as a language for all applications since the 1990s. Initially it was supposed to be used as a programming language for mobile phones. But soon it was used for programming in the Internet. Among other things, Java ensures that animated, i.e. moving, images are displayed correctly.
- PHP
Have you ever registered online somewhere with the help of a registration form and forgotten to fill in a field? In this case, you probably received an error message such as "Your input is not complete". PHP is responsible for this error message. PHP is used wherever user input needs to be processed.

A Look behind the Scenes

You just learned about different programming languages. When surfing the Internet, you see beautifully designed pages and images that have been programmed with the help of these languages. The result is the source code. The source code of a web page consists of characters and letters and lies behind the visible page. It is usually invisible to the user.

3 Facts about Coding

Coding has much more to offer than just source code and programming languages. These facts show you just how diverse the subject of coding and programming can be. Did you know...

... that mathematician Grace Hopper created the first compiler in 1949?

... that the first higher programming languages have already been developed in the 1940s?

... that almost 70% of programmers learned to program themselves?

CODING IN EVERYDAY LIFE

On the way to the office you are listening to a podcast about coding. Fascinated by the topic, you take a closer look at your surroundings. You will be surprised where coding is hidden.

Coffee Mug

Just a quick coffee and then off to work? Most cafés and bakeries use vending machines that prepare hot drinks at the touch of a button – whether coffee, cappuccino or latte macchiato. This is only possible because the preparation of the drinks is already stored as a program in the machine.

- Trees
Of course, the trees themselves are not programmed. But: green areas in cities are planned precisely, just like, for example, streets. Special landscaping software is used for this.
- Public Transportation
In road traffic, coding supports drivers and passengers – e. g. in navigation devices, for displaying the next stop or for electronic timetables.
- Street Lamps
Street lamps are also controlled using a program. Either the street lamps switch on automatically at a certain time or when twilight sets in.
- Fashion Business
Fashion and coding are more closely related than you think. Well-known designers plan their latest garments with programs first. Then they are produced and sent off to the catwalk.
- Music Business
Without coding, electronic music would be unthinkable! Music styles like house or techno use programmed drums and instruments. Programs and codes are used for all music styles

- from recording music to post-production in studios and at concerts.
- Smartphone
With a smartphone, coding accompanies us throughout the day. Whether you are sending a message, listening to music, or using a game app, you will find codes and applications everywhere.

The Code in our Food

Coding has become an integral part of everyday life. Many apps and programs make life easier. However, we are often not even aware of where coding makes sense. On the following pages you will learn how coding influences something vital – our food.

Coding in Agriculture

We all know that food does not fall from the sky. Before our food lands on our plate, it must grow and, above all, be harvested. Take a minute to think before reading on. How could coding facilitate agricultural work?

Technical support will become increasingly important in agriculture. The latest technologies of "Agriculture 4.0" also sound futuristic. Programmed tractors harvest crops by themselves. Drones monitor the fields and draw attention to problems. Even the animals are observed and fed by programs.

Coding at the Supermarket

With a full cart at the supermarket cash register and once again, the line is much too long. Take a minute to think before reading on. How could coding make the situation at the supermarket easier?

Soon you will not even have to pay in the supermarket. At least not at the cash register. In Seattle, Amazon has opened the first supermarket without cash registers. The store remembers every item that is taken off the shelves. The store uses many cameras and special scales on the shelves for this purpose. When you leave the store, the money is debited from your account.

Coding and Food

You come home late at night, have had one appointment after the other all day and now you have to wash dishes? – No wonder you do not want to cook. Take a minute to think before reading on. How could coding help here?

A few clicks later, your food is already on its way. Numerous delivery service apps bring food right to your doorstep. And business is booming. In 2017 alone, the industry had a turnover of almost 3 billion Euros.

The Million Program

When the brothers Maxim and Raphael Nitsche introduced their mathematics app "Math 42" in 2013, they had no idea what a success it would be. The app tutors students in mathematics. That is, it supports them in solving formulas or draws interactive graphs. The app is successful and is now used by 1.8 million people worldwide. In 2017, the app was sold to the USA for 20 million euros. That is how a good idea becomes a fortune.

LEARNING TO PROGRAM

Can Everyone Learn to Program?

Everyone can learn to program! At least that is what celebrities like Bill Gates or Mark Zuckerberg say. But is that really true? The “Hour of Code” initiative makes it possible. With the help of small units, children, adolescents or adults learn to write their own program within an hour. The only things specified are the tasks and the required program blocks. The goal of the “Hour of Code” is to overcome preconceptions.

Learning to Program in School

In the future, programming will not only be learned privately at home, but also in schools. This topic is often discussed in the media.

What do you think: Should coding be taught and learned in schools?

Contra Programming

- Programming alone is not enough, to understand the digital world.
- Children should learn to read and write properly instead of programming.
- Choice not obligation: Pupils should be allowed to choose!

Pro Programming

- Coding is the language of the future. Teaching it is the task of schools.
- Programming promotes children’s problem-solving abilities.
- Children should not only be allowed to use digital technologies, but also to play an active role in shaping them.

Tools for the Programming World

- Bee-Bot
Coding and small children – does that make sense? Small robots such as the Bee-Bot are perfect for bringing the idea of coding to little children. The little bee is programmed using the buttons on its back. In addition, there is a game plan on which the robot moves as programmed by the children. With the Bee-Bot, pre-school children can gain valuable coding experience while having fun.
- Calliope Mini
The Calliope mini is intended to make it easier for all children from the 3rd grade upwards to get started with programming. The possibilities are manifold: glowing lights, hearts on the small display or circuits arouse interest in coding at a young age. The Calliope mini is already being used in some German states.
- Lego WeDo
Do you remember the small colorful Lego bricks from your childhood? They are not just suitable for playing, but also as an introduction to the programming world! Lego WeDo combines play and coding in a meaningful way. First, the robots are built and then programmed on the computer.
- CODE – University of Applied Science
There are also many different ways for adults to learn coding. The private

university CODE was founded by the entrepreneur Thomas Bachem for this purpose and offers courses of study for prospective software developers, designers or product managers.

Programming as an Opportunity

Programming opens up opportunities in the professional world.

Refugees Learn to Program

It is not always easy for refugees to find a job in a new country. They often already have a degree or vocational training. Programmers are currently very sought after. The programming school "[refugees{code}](#)" in Austria gives a total of 21 refugees, both men and women, new professional opportunities.

Over the course of 9 months they learn how to use three different programming languages. And it pays off! "[refugees{code}](#)" already successfully found jobs for several graduates – for example, at the company that operates the flea market app "Shpock".

Homeless Man Learns to Program

The software developer Patrick McConlogue lives and works in New York, where he met a homeless man named Leo every morning on his way to work in summer 2013. One day McConlogue decided to start an experiment with Leo. He spoke to him and gave him a choice: Offer # 1: McConlogue would bring the homeless man \$100 the next day. Offer #2: McConlogue would bring the homeless man a laptop and books with instructions for programming the next day. In addition, he offered to leave work an hour early every day to teach the man how to program.

Leo chose the second offer. Together with the software developer, he learned the basics of programming every day for one hour. In the meantime, Leo has programmed his very own app on the topic of global warming.

CODING IN THE FUTURE

Coding in the World of Tomorrow

Robots, artificial intelligence or the transparent man and mass surveillance. These are well-known topics from science fiction books or films. What sounds like a dream of the future could soon become reality. Everyday life and the working world are changing and coding plays a decisive role.

The Working World of Tomorrow

- Flexibility: Networking via the Internet makes work more flexible. In the future, workers will be able to determine where, when and with whom they work.
- New Technologies: New technologies will support you in your work. Video conferences and the quick exchange of data and documents on the Internet are becoming part of everyday life.
- Workplace: The workplace is changing. Employees work less frequently at their desks and more with their colleagues – e. g. in rooms where they can exchange ideas together.
- Creativity: Creativity will become more and more important. Many work processes will be

carried out automatically by machines or artificial intelligence. But humans will always have the best ideas.

Coding – A Man’s Domain?

Programmers are very sought after – and often men. But there is actually no reason for that.

Under the hash tag [#kodewithklossy](#), the model Karlie Kloss organizes summer camps and workshops for girls and women around coding; a chance to get to know the apparent male profession without hesitation.

“Not Everyone has to be able to Code”

Even if programmers have good chances on the job market – not everyone has to be able to program! Much more important than programming itself is the ability to think digitally and get involved in the digital world.