# Introduction to machine learning, programming, data science, artificial intelligence, neural network and deep learning

Reference:

- 1 Oleksii Kharkovyna ( https://towardsdatascience.com/machine-learning-vs-traditional-programming-c066e39b5b17 )
- 2 Bernard Marr and Co. ( https://bernardmarr.com/default.asp?contentID=1789 )

## Part 1



**Artificial Intelligence** can constitute image processing, cognitive science, neural networks ,machine learning, etc.

Machine Learning is a field of study that gives computers the ability to learn without being explicitly programmed(**Arthur Samuel** ). Programs do not necessary use a pre-written algorithms. They know/ learn to solve the problems on their own.

## Services available through Machine learning

- Face/ voice recognition
- Driving a car (Google Self-Driving Car),
- Diagnose diseases by symptoms (Watson), Targeted adds for products, books (Amazon), movies (Netflix), music (Spotify),
- Perform the functions of a personal assistant (Siri, Cortana)
- ETC.

**Three levels of machine learning accessibility**:

- When exceptionally used by major tech-giants like Google or IBM.
- When for example a student with a certain amount of knowledge can use it.
- When a lay man use it.

**ML-tasks:**

- Learning with a teacher (supervised learning).
- Learning without a teacher (unsupervised learning).

Teacher here means the idea of human intervention in data processing.

**ML vs Programming:**

In traditional programming, a person hard codes the behavior of the program. In machine learning, a lot of that (developing behavior of a program) is left to the machine to learn from data.

Does this mean traditional programming is not important any more?

# ML vs Programming:

ML just like AI is not a substitution, but supplementation for traditional programming approaches. For instance, ML can be used to build predictive algorithms for an online trading platform, while the platform's UI, data visualization and other elements will be performed in a mainstream programming language such as Ruby, or Java.

ML is used in the case when traditional programming strategy falls behind and it is not enough to fully implement a certain task.

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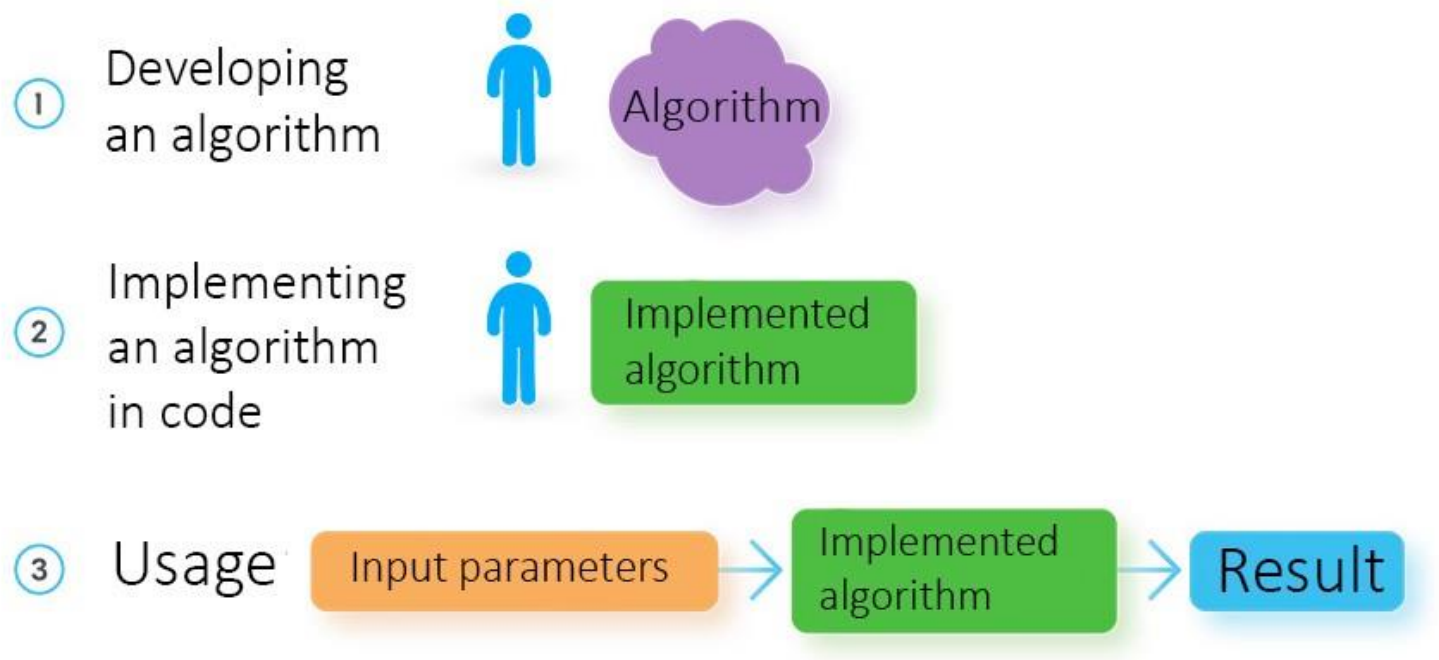
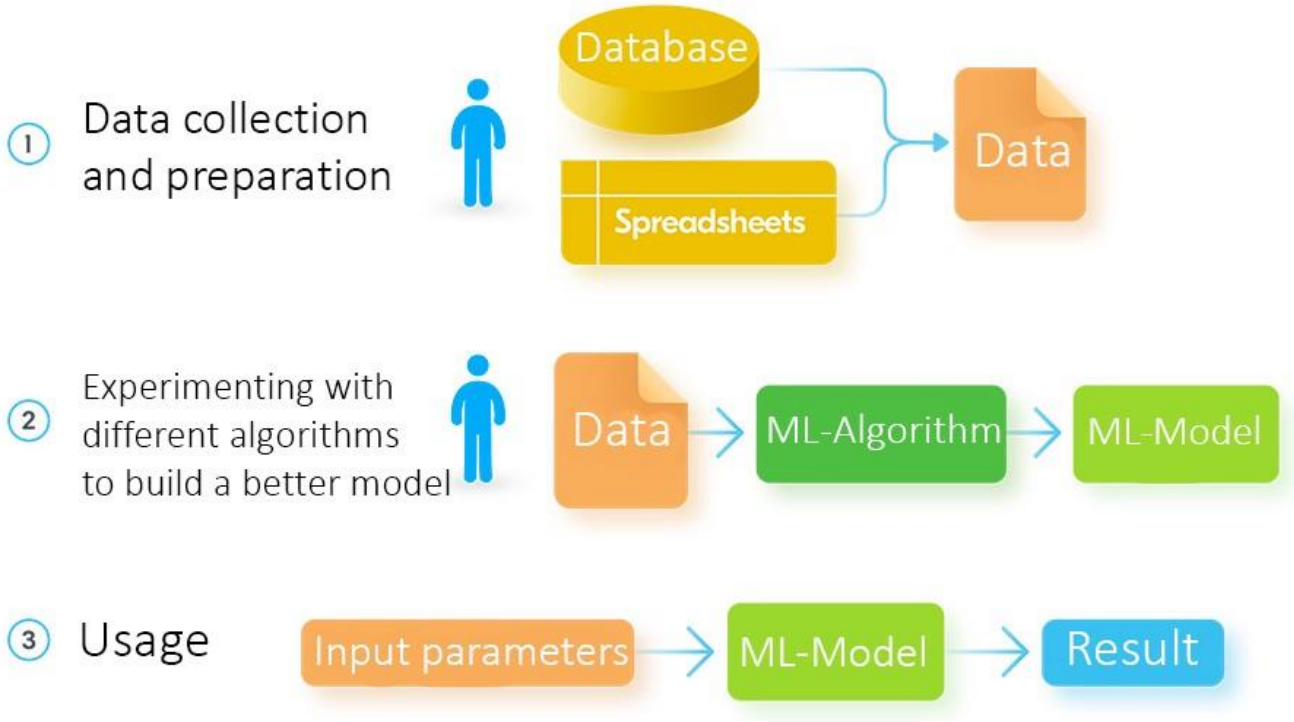
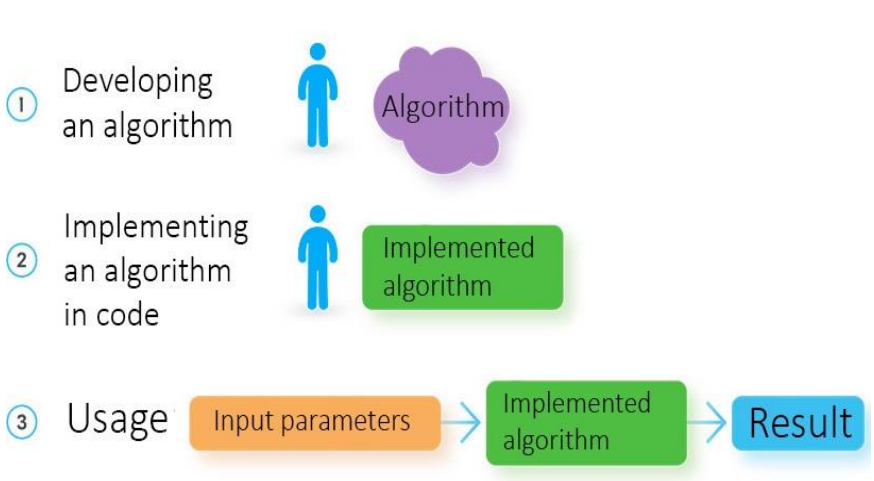
# How a software developer creates a solution (Programming)-no prediction

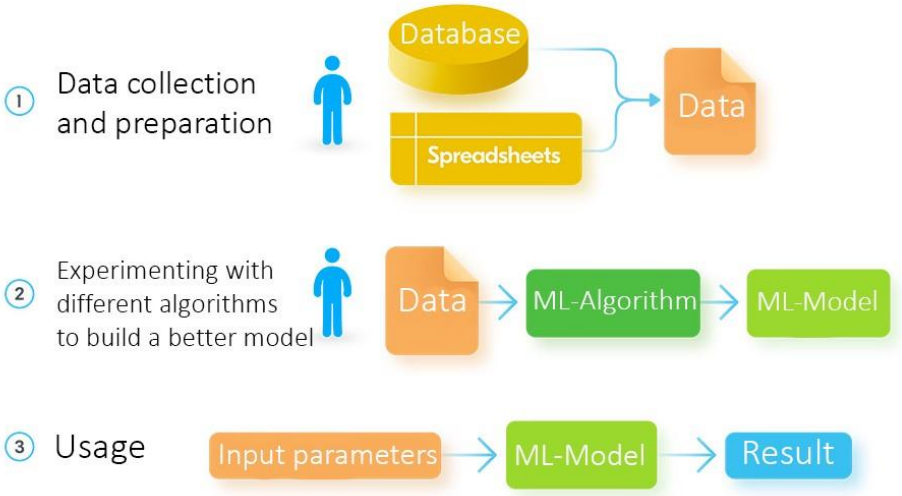


# How a data engineer develops a solution using machine learning – prediction



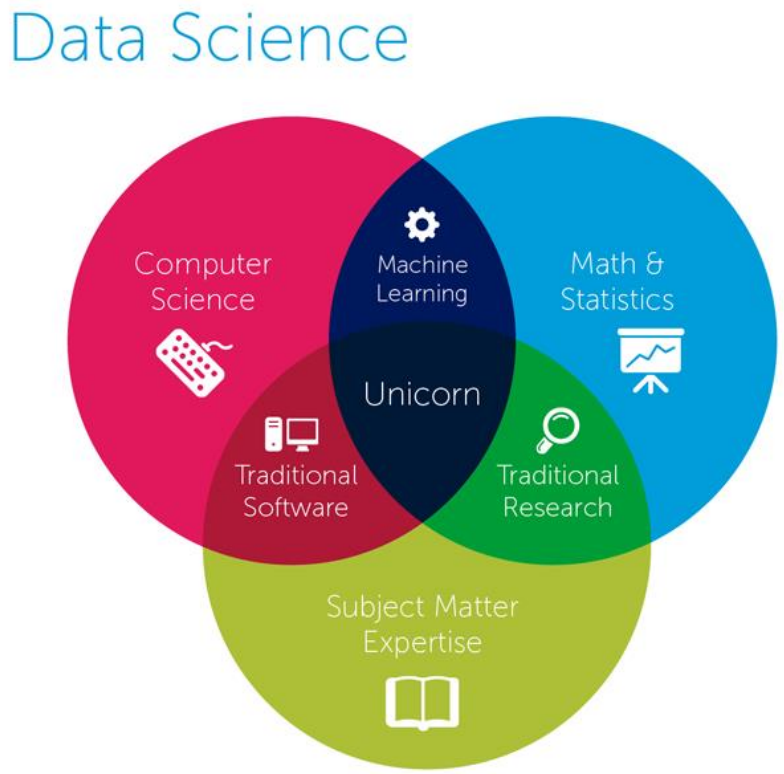
# Traditional programming and machine learning



# Data science (Data scientist)

**Data Science** is a multi-disciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data.

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# Data science (Data scientist)

**Data Science** aims at  processing data and extracting useful information from them.

Data scientists use powerful hardware, programming systems, and efficient algorithms to solve problems.

# Machine learning (Machine learning engineers)

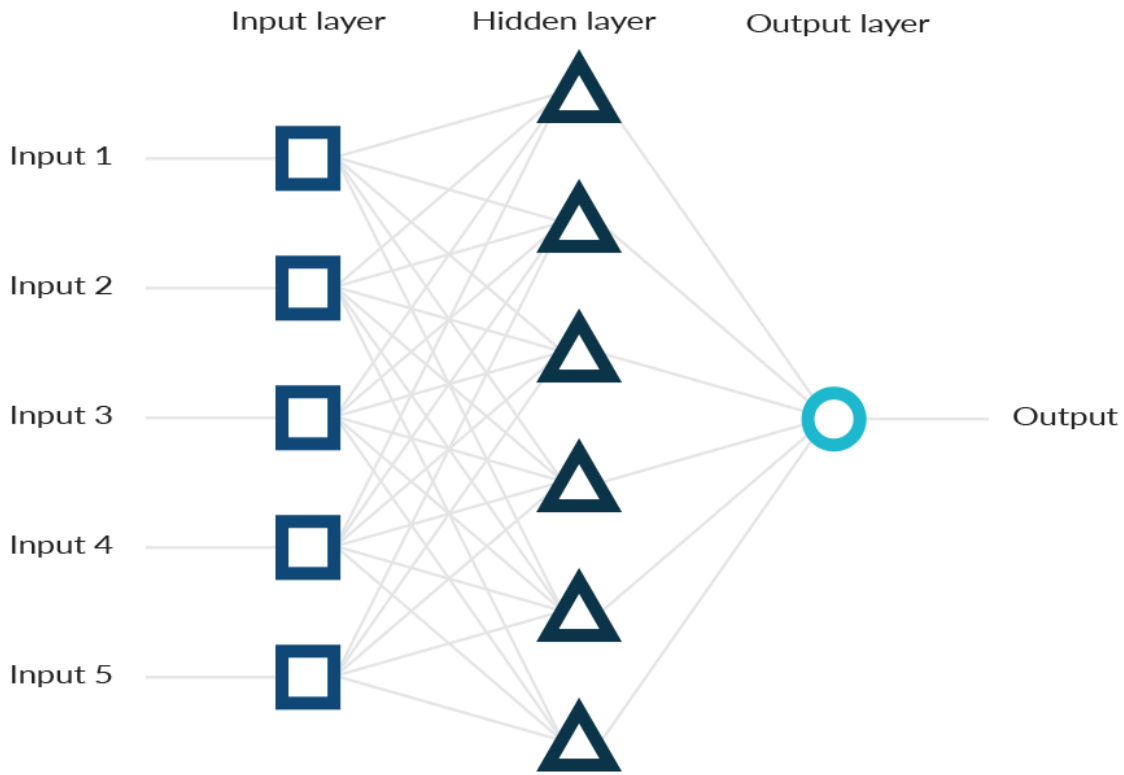
The position of the **Machine Learning Engineer** is more “technical”. In other words, ML Engineer has more in common with classic Software Engineering than Data Scientist.

The standard tasks of ML Engineer are generally similar to Data Scientist. You also need to be able to work with data, experiment with different machine learning algorithms that will solve the problem, create prototypes and ready-made solutions.

# Can you explain the difference between Programming and machine learning?

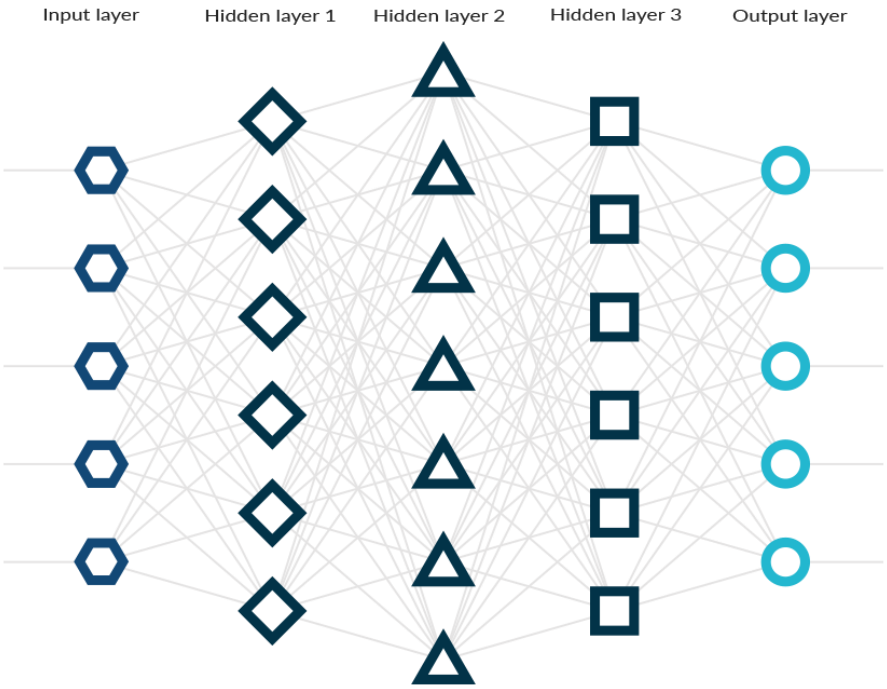
# AI (neural networks and deep learning)

- neural networks are mathematical models *inspired* by the human brain



# AI (neural networks and deep learning)

- The difference between neural networks and deep learning lies in the depth of the model. Deep learning is a phrase used for complex neural networks.



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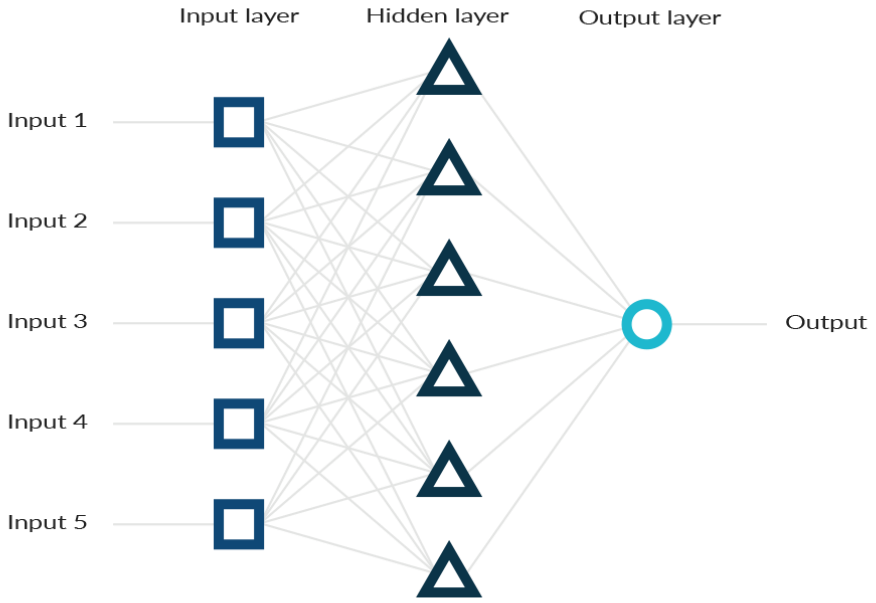


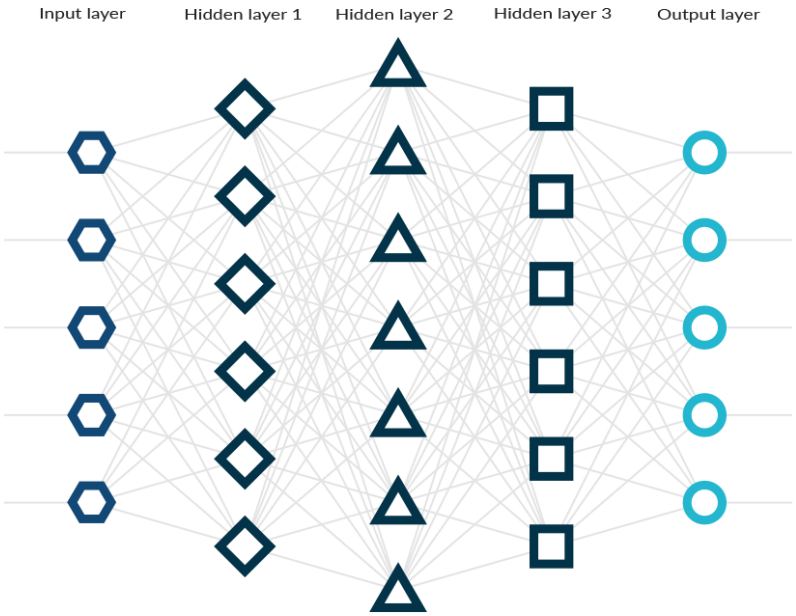

# Thank You!