Статья: **“What is Machine Learning?”** Цыпышев Тимофей ИУ5-11Б

Arthur Samuel, a pioneer in the field of artificial intelligence and computer gaming, coined the term “Machine Learning”. He defined machine learning as – a “Field of study that gives computers the capability to learn without being explicitly programmed”. In a very layman’s manner, Machine Learning(ML) can be explained as automating and improving the learning process of computers based on their experiences without being actually programmed i.e. without any human assistance. The process starts with feeding good quality data and then training our machines(computers) by building machine learning models using the data and different algorithms. The choice of algorithms depends on what type of data do we have and what kind of task we are trying to automate.

**Example:** Training of students during exams. While preparing for the exams students don’t actually cram the subject but try to learn it with complete understanding. Before the examination, they feed their machine(brain) with a good amount of high-quality data (questions and answers from different books or teachers’ notes, or online video lectures). Actually, they are training their brain with input as well as output i.e. what kind of approach or logic do they have to solve a different kinds of questions. Each time they solve practice test papers and find the performance (accuracy /score) by comparing answers with the answer key given, Gradually, the performance keeps on increasing, gaining more confidence with the adopted approach. That’s how actually models are built, train machine with data (both inputs and outputs are given to the model), and when the time comes test on data (with input only) and achieve our model scores by comparing its answer with the actual output which has not been fed while training. Researchers are working with assiduous efforts to improve algorithms, and techniques so that these models perform even much better.

**Basic Difference in ML and Traditional Programming?**

* **Traditional Programming:** We feed in DATA (Input) + PROGRAM (logic), run it on the machine, and get the output.
* **Machine Learning:** We feed in DATA(Input) + Output, run it on the machine during training and the machine creates its own program(logic), which can be evaluated while testing.

**How does ML work?**

* Gathering past data in any form suitable for processing. The better the quality of data, the more suitable it will be for modeling
* Data Processing – Sometimes, the data collected is in raw form and it needs to be pre-processed.
* Divide the input data into training, cross-validation, and test sets. The ratio between the respective sets must be 6:2:2
* Building models with suitable algorithms and techniques on the training set.
* Testing our conceptualized model using data that was not entered into the model during training.