Data Science for AI

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Understanding Data Science

Understanding the Term

“data science”

The study of data in an analytical manner to derive useful insights, involving principles of observation, critical thinking, mathematics and computer science.

Computers vs Humans

Let us consider an analogy of ourselves to understand how computers use data to draw results.

Humans work on data too (experience, or knowledge). They are pretty dumb when they are born, but slowly, as their senses provide them more experience of the world, they actively use this experience to build their character.

Computers are no different. They work on the same principle. Computers are nothing but dumb boxes, which we tricked into working by passing electricity through it. However, once they know their approach to the data, they have the ability to execute the functions very quickly.

Essence of Data Science

Data is essentially inputs, or a bunch of facts that could be gathered together and studied upon to draw out certain patterns and relations.

Many things in the universe can be linked to each other. These do not always have to be linked by nature. Human beings can link them out by their own means too.

One example of this is use of mnemonics to remember things. Such mnemonics might have no logical or technical correlation with their subjects, but it helps our brain form a linkage through which we can recall the subject matter.

The Art of Learning

$$Subs\ t = \frac{v-u}{a} \quad into \quad s = ut + \frac{1}{2}at^2$$

$$s = u\frac{(v-u)}{a} + \frac{1}{2}a\frac{(v-u)^2}{a^2}$$

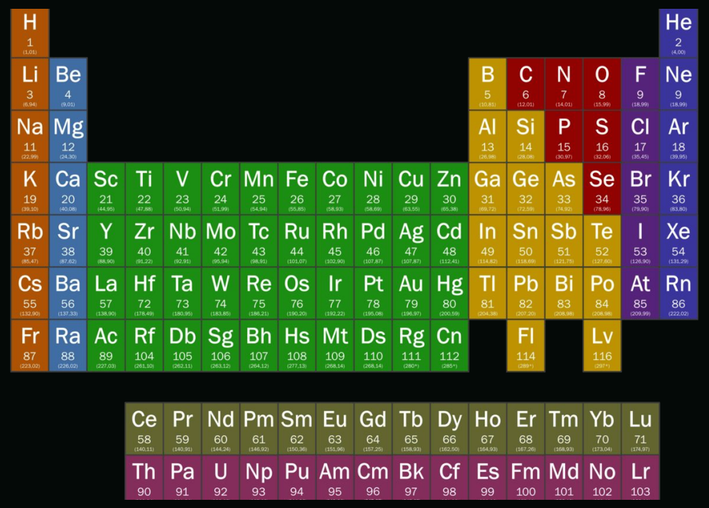
$$s = u\frac{(v-u)}{a} + \frac{1}{2}\frac{(v-u)^2}{a}$$

$$2as = 2u(v-u) + v^2 - 2uv + u^2$$

$$2as = 2uv - 2u^2 + v^2 - 2uv + u^2$$

$$2as = v^2 - u^2$$

$$v^2 = u^2 + 2as$$

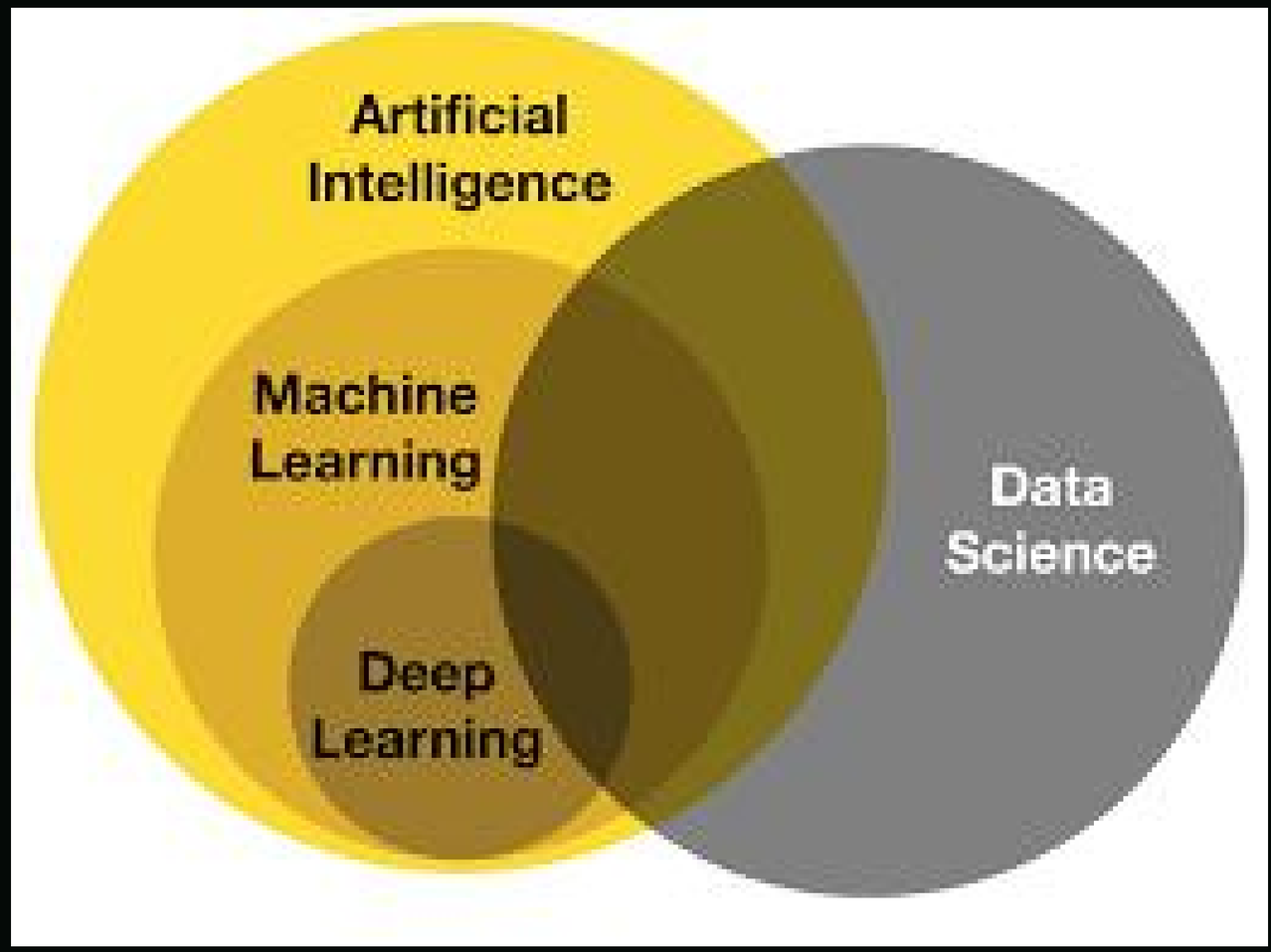


Thinkology

If so many people were web developers, why does no one make the next Google, WhatsApp or Instagram??

If ChatGPT works on the same principle of data science, why is it called an AI-assisted bot then??

AI vs Data Science



Evaluating Data Science Projects

We will attempt to look at the whole process of creating machine driven analyses from raw data through different example problems. The fundamental funda is to carry your common sense along the way.

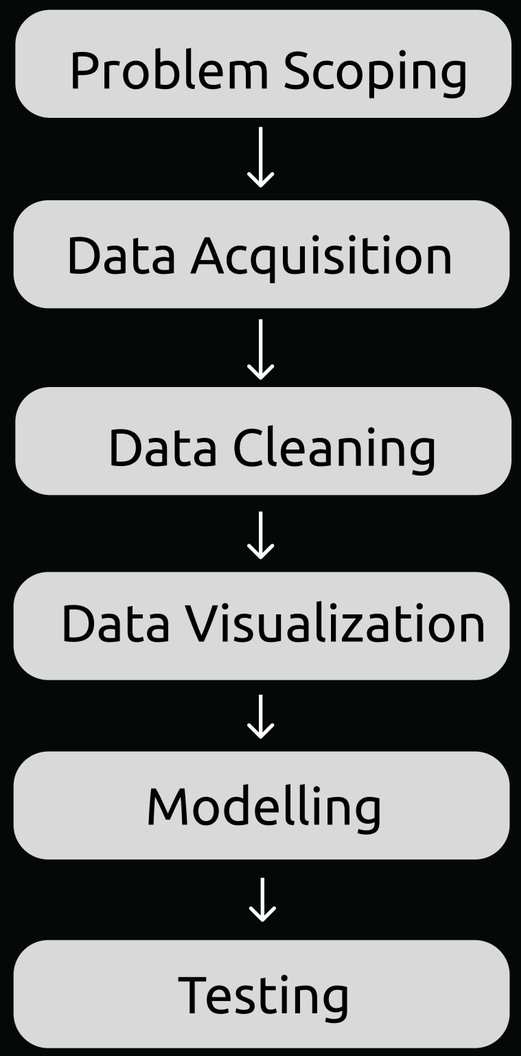
Clear Your Concepts First!

Problem 1: This is a human level problem meant for understanding analogies through critical thinking. You are a student at the initial stage of preparation for your board examinations. Devise a general algorithm that you would follow.

Test Your Concepts!

Problem 2: Let us try to create our own data science-based project algorithm to predict class attendance rate.

Stages of the Project



Thinkology

“Data Science is the fundamental basis over which Machine Learning, AI and Deep Learning rely.”

“Torture the Data and it will confess to anything”

“Without Data Science, companies would be deaf and blind stuck in the middle of a freeway”

Tools for Data Science

Why Python

Python is one of the most popular, if not the most popular programming languages when it comes to Data Science.

But why?

Python is simple to use and has a plethora of library and frameworks to simplify and increase the speed of development. Moreover it is easier to deploy your AI projects using Python by using frameworks like Streamlit or Flask.

It also has specific libraries for data scientists, who are not shenanigans at programming. 🤔

R

Python

Online Notebooks

When dealing with data, processing it can be a herculean task at times. By using our conventional python files, what we would essentially do is rerun the same code again and again.

Hence data scientists use a type of document known as iPython notebooks, where you can execute code and see the result line by line. It is more convenient and is easier to analyze.

The two most popular applications for making and executing notebooks are Jupyter Notebook and Google Colab.

Reference Links

Absenteeism Predictor Example

ArogyaKheti

“The only way to learn data science is by doing data science.”


Q&A