

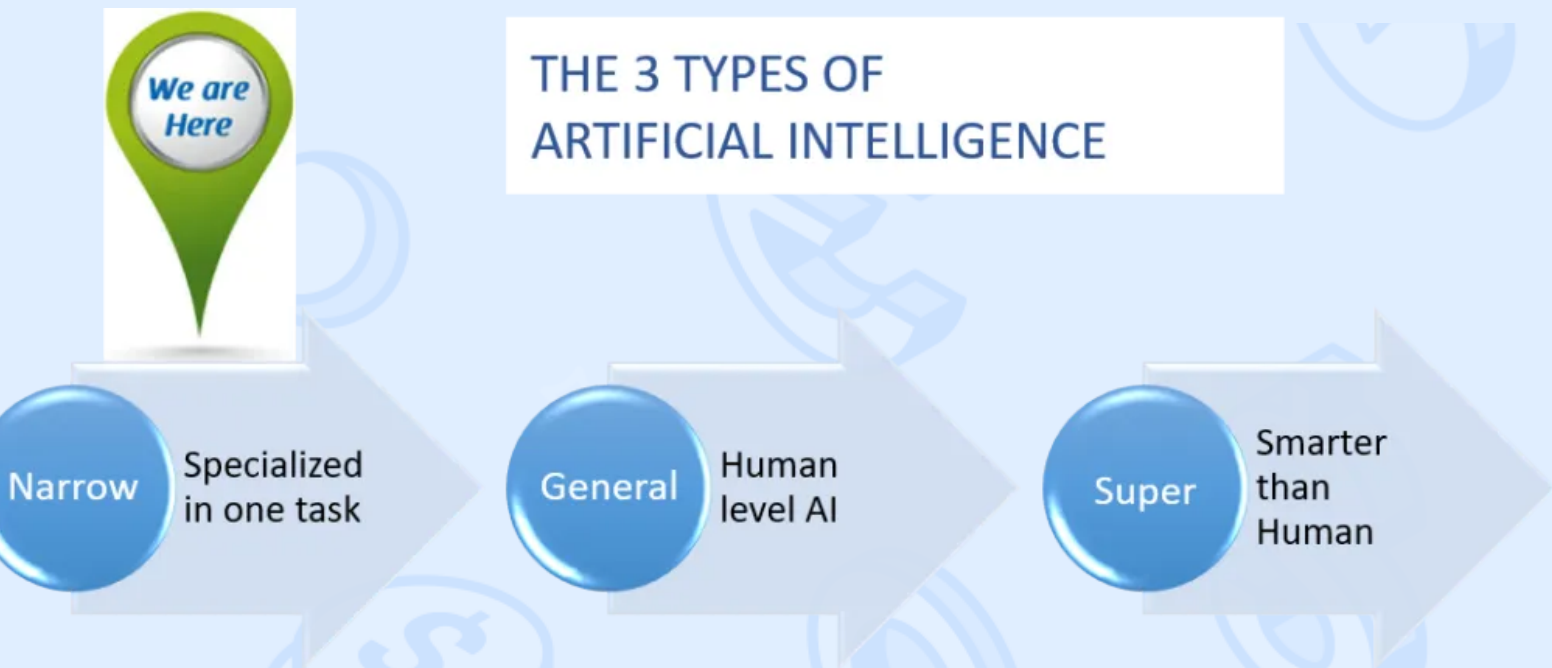
# ARTIFICIAL INTELLIGENCE PROGRAMMING FOR BEGINNERS



Artificial Intelligence is expected to grow into a \$118.6 billion industry by 2025. The only potential limitation to that growth is a lack of experts. In other words, AI today means high employee salaries and broad possibilities for development. It's also your chance to be in the avant-garde of science and create products that are going to transform the future of humanity.

## Types of Artificial Intelligence

The term Artificial Intelligence (AI) comprises a variety of different types.



### Weak AI, or Narrow AI

Weak AI is developed in order to solve just one task. It cannot be understood as proper intelligence or self-awareness. Siri can serve as an example – it performs standardised functions well but you cannot have in-depth conversations with it.

### Strong AI, or True AI

True AI is much closer to the concept of a computer being smart. Ideally, this sort of artificial intelligence can perform tasks in a similar manner to how a human would act. This is what programmers are trying to achieve when building robots like [Sophia](#).

### Artificial Superintelligence

Artificial Superintelligence refers to the most impressive variety of computers that for today remain a dream.

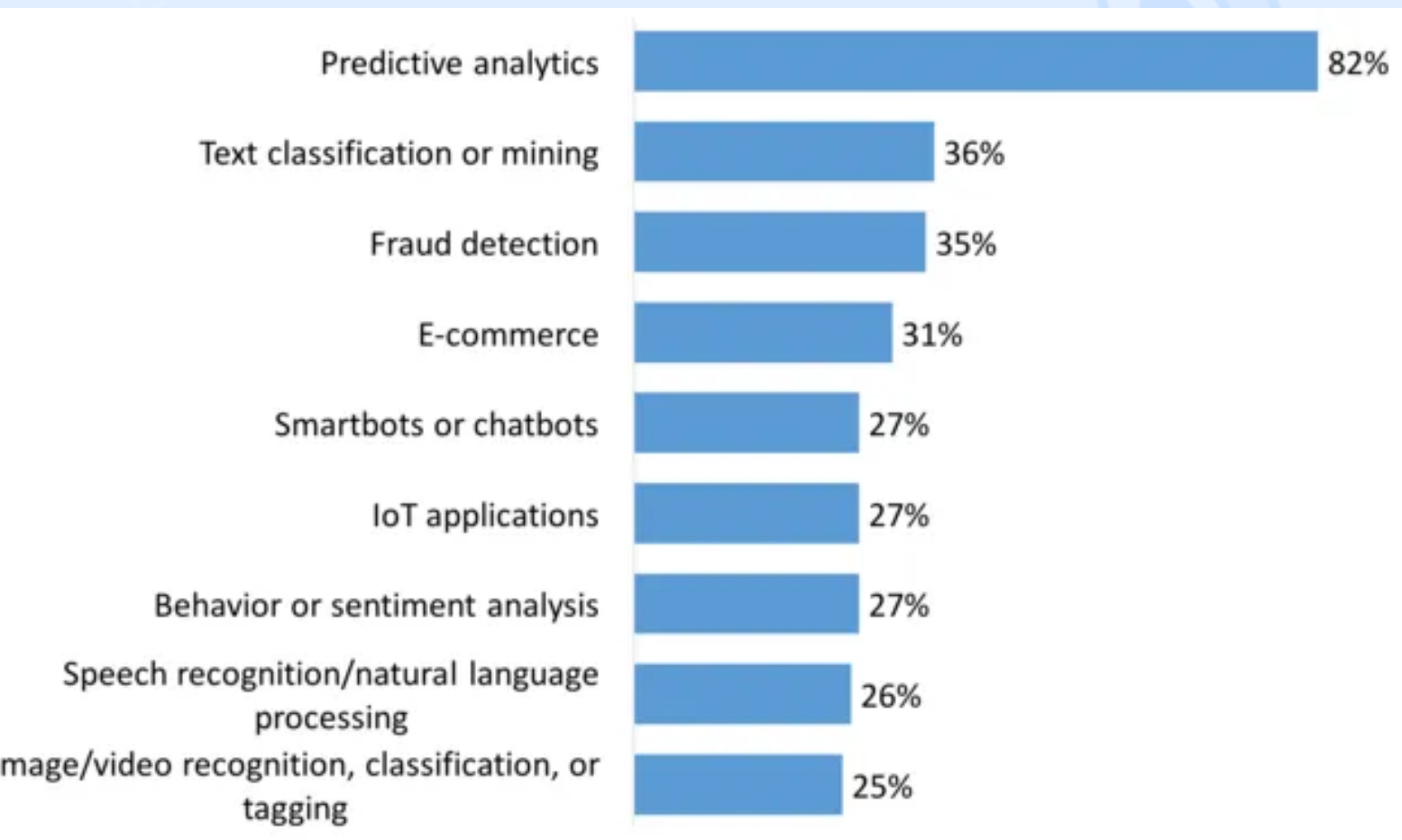
- They are much smarter than humans not only in terms of theoretical knowledge but in those of creativity and social skills. Some scientists, such as Stephen Hawking and Elon Musk, even have concerns that the potential existence of such a variety of AI could be the reason for human extinction.

## Becoming an AI programmer

For a successful start to a career in the field of AI, the first thing you need to do is master the following subjects: logic and mathematics, including statistics and probability, linear transformations, differential equations, stat functions and algorithms.

**Complicated as it is to realise, AI can demand the comprehensive application of psychology, linguistics, philosophy, neuroscience, artificial psychology and more.**

## Some applications of AI analysis



**Depending on its practical implementation, an AI programmer can be involved in different areas of focus such as robotics, smart software, neural nets, etc.**

It's impossible for one person to master all the relevant trades. Therefore, there are two types of AI development companies on the market:

- large enterprises with dozens of developers, divided by fields;

- niche-targeted local AI programming teams, working with one particular subject, such as driverless cars or AI image recognition.

***Cutting-edge technologies demand significant efforts towards investigation and implementation, so the services offered are quite expensive, while the AI programmers themselves are considered valuable and are thus very well-paid.***

## Starting a career of AI programmer

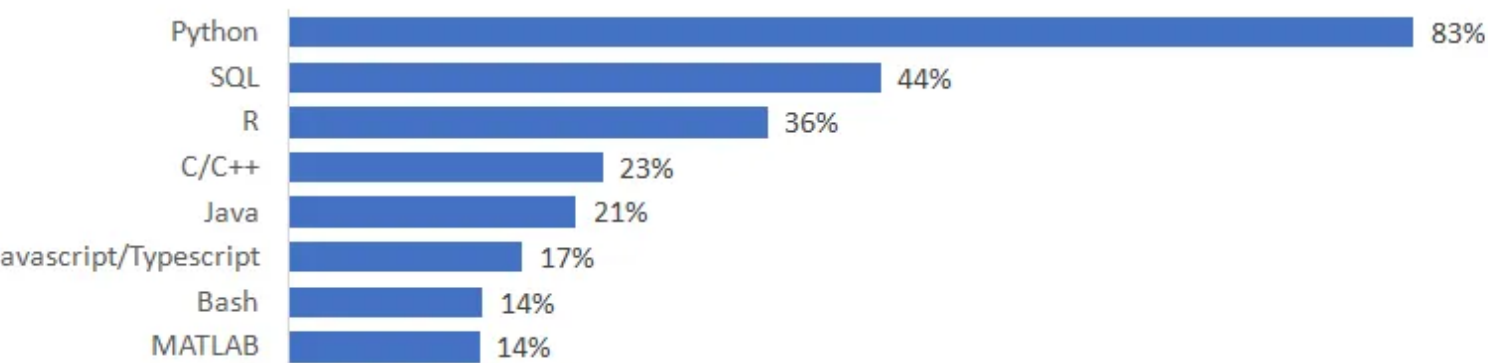
A report published by Paysa found that 35 percent of AI positions demand a PhD and 26% require a master's degree.

- Next you need to grow into working with AI, starting as a junior software engineer and obtaining more and more skills on the go.
- The best option for starting your career as an AI programmer is to apply for an internship at a world-renowned company such as Google, Apple, Amazon or Facebook.

For future perspective evaluation, read what is demanded from AI programmers based on their specialisation [here](#).

## Six top programming languages for AI

### What programming language do you use on a regular basis?



**These six programming languages rule the world of Artificial Intelligence.**

### 1. Python

The simple syntaxes of this language can be learned by a newbie. To use this language effectively, however, requires a lot of practice.

- Also, Python development takes less time in comparison to other languages such as Java, C++ or Ruby. It's a general-purpose object-oriented language, so projects of different complexities can be written on it. It also has plenty of diverse libraries to choose from.

## 2. R

R is great for processing statistical data. It provides opportunities to include mathematical symbols and formulae where needed. It's a general-purpose language that supports useful packages for Artificial Intelligence programming such as RODBC, Gmodels, Class and Tm. These make it super easy to implement machine learning algorithms.

## 3. Lisp

This is the language that was originally used for AI development ever when the field first appeared in 1958.

It offers many advantages well-suited AI programming tasks:

- good for prototyping,
- processes symbolic information quickly and efficiently,
- has automatic garbage collection.
- The recompilation of files is allowed while the program is running.

Some of these features have migrated into other languages, leading to a decrease in the overall popularity of Lisp.

## 4. Prolog

This computing language is one of the first to appear in AI field. Features you can enjoy include pattern-matching, tree-based data structuring and automatic backtracking.

- Together these make Prolog a flexible and powerful programming tool. It is frequently used in medical projects. The only problem – it requires more expertise to master than Python or Lisp.

## 5. Java

Java for Artificial Intelligence solutions deals with search algorithms, neural networks and genetic programming. Thanks to many cool tools – easy debugging, multiple package services, simplified syntax - it allows you to build large-scale projects, as well as offering powerful tools for graphical data representation. It also permits the implementation of Swing and SWT (the Standard Widget Toolkit) to create attractive user interfaces.

## 6. C++



This is a high-level programming language used to write programs with the highest execution speed. This makes C++ extremely useful for AI projects, especially those that involve natural language processing or image recognition.

## Holy war: Python against MATLAB



There is something of a holy war going on between these two. Being the two most popular languages, they enjoy a certain competition. Many believe that Python is miles ahead of MATLAB. However, unlike Python, MATLAB offers a whole system of methods for solving AI tasks.

### Pluses of Python:

- it's one of the oldest and most commonly used programming languages. It has an extensive library, regular updates and, overall, has no chance of letting you down all of a sudden.
- it's a high-level general-purpose programming language. Mastering it, you can write any kind of software.
- impeccable logic of a language that is easy to read.
- it's open and free.

### MATLAB has its benefits too:

- unlike Python, it's not just a language but a computing environment with its own IDE, standard library and GUI.
- Simulink, one of the products, has no analogues on the market. This environment for graphical modelling simplifies the process of creating multi-domain dynamical systems thanks to a block diagramming tool and a customisable set of block libraries.
- Lower threshold than Python. No need to install environment, choose the library and so on.

However, many programmers who chose MATLAB eventually end up switching to other languages. Also, it's quite expensive.

## Artificial intelligence programming skills list

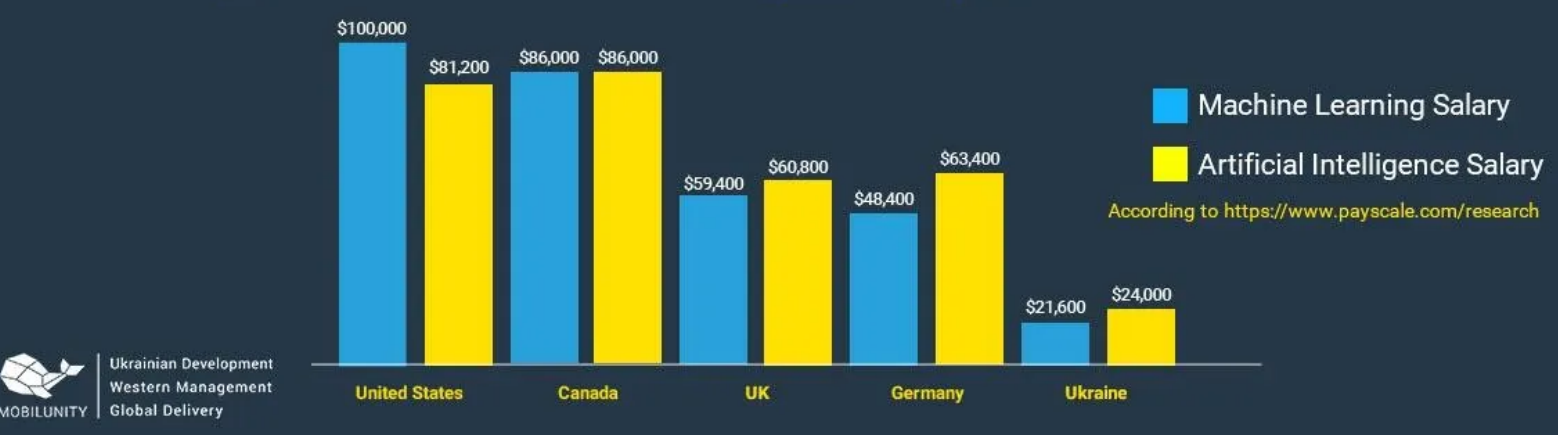
AI programming tools you need to master if you choose Python:

- **NumPy** - a fundamental package for AI computing with Python. It contains a powerful N-dimensional array object, tools for integrating C/C++ and Fortran code, useful linear algebra, Fourier transform, and other capabilities. Can be utilised as an efficient multi-dimensional container of generic data.
- **PyTorch** – an open-source machine learning library based on the Torch library. You use it to write components for computer vision and natural language processing. Made by Facebook's developers.
- **Jupyter Notebooks** – a web application that helps to make and share documents. Contains live code, equations, visualisations, and text. Open-source.
- **Anaconda** – a distribution of Python and R used in data science, machine learning, and other fields of AI. Helps to simplify the package management and deployment process.

MATLAB is a whole suite of components. Once you install the product, you will be able to use all of them: IDE, Simulink, GUI builder, image processing TK and a file exchanger. A more in-depth comparison of the two languages can be found [here](#).

## Salary review statistics for AI software engineers worldwide

### Average Annual AI vs ML Developer Salary in Different Countries



According to Indeed.com, the average IT programmer salary (keyword “artificial intelligence engineer”) in London varies from £45,000 to £75,000 per year.

In San Francisco, it ranges from approximately \$134,135 per year for “software engineer” to \$169,930 per year for “machine learning engineer.”

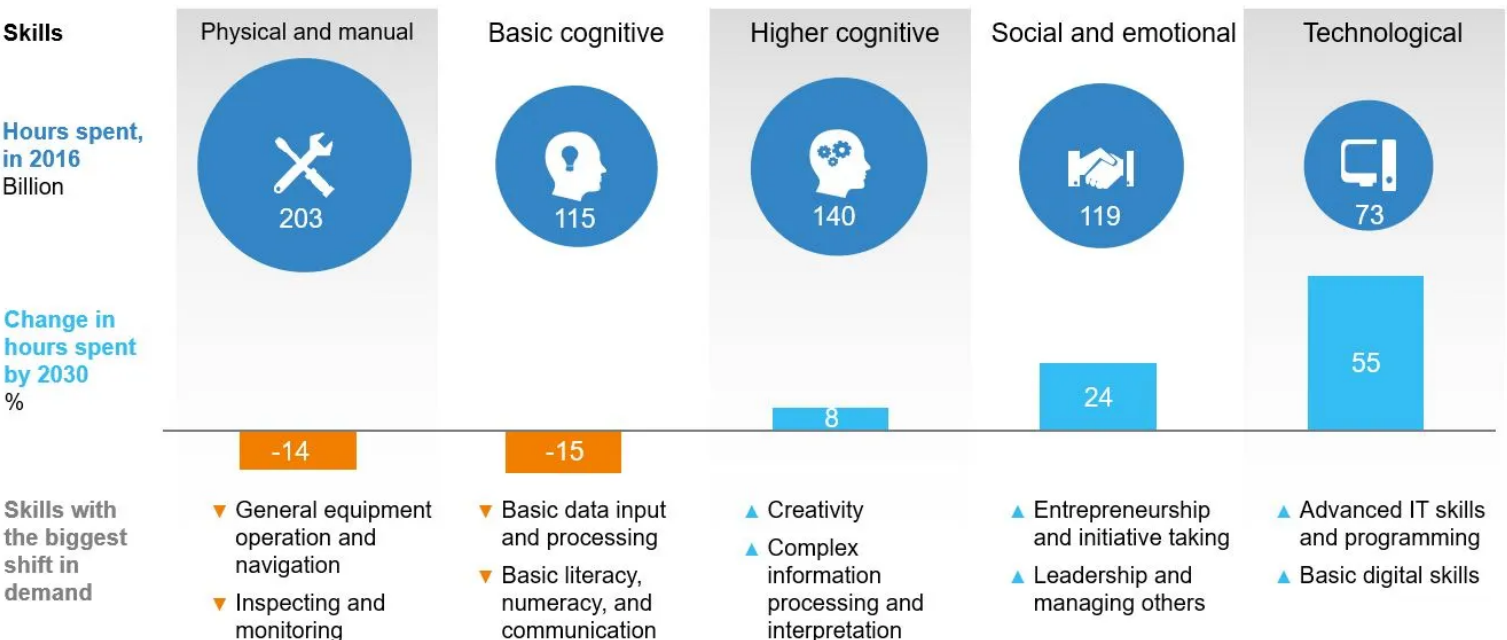
## Worldwide dispersion of AI programmers’ earnings

AI is swiftly evolving, so having gone through a PhD, participating in academic projects, you tend to be more innovative and get used to the ever-changing environment of this scientific field.

As for the concern that AI is going to steal jobs, we would like to cite a recent report from Gartner. It demonstrated that AI will indeed eliminate 1.8 million jobs, mostly manual labour. However, it will create 2.3 million new jobs by 2020. This statement was also emphasised by a recent Capgemini report. It found that 83% of companies using AI say they are adding jobs because of it.

### Automation and AI will change the skills needed in the workforce

Total is for United States and 14 Western European countries



McKinsey & Company 1

## AI tutorials for aspiring programmers

### Good tutorials in artificial intelligence programming:

#### 1. Coursera Python specialisation



Attend a free online course in [Python programming](#) on Coursera. If you want a certificate to add to your CV, monthly payment is required. During the course, you will learn the basics of Python as well as principles of SQL databases and obtain basic skills in data structuring and management.

## 2. Python course from Code academy

Explore [Python programming](#) and other courses at Code Academy. This online portal enjoys a good reputation for its comprehensive and interactive online courses.

## 3. Stanford on Machine Learning

Machine Learning is one of the most promising fields of AI for today. If you're interested in learning how it's done, join [this](#) Stanford course.

## 4. Robotics

Have you ever dreamed of creating robots? Test the [online specialisation](#) that will teach you the basics of Robotics from the perspective of coding and design.

*And if you're not ready to go on this journey along but still need an Artificial Intelligence solution, contact us – we can back you up at any stage, from the creation of a working prototype to a complicated AI software system.*