1. AI
   1. Historia AI
      1. Przegląd od mniej więcej 1950 roku
   2. AI dziś
      1. Zalety
      2. Zagrożenia
      3. Rodzaje – general, super itd.
      4. Zastosowania – ML, NN, CV, NLP
2. Dane
   1. Ile danych jest produkowanych rocznie i jakie są prognozy na przyszłość – dlaczego tak szybko to wszystko rośnie
   2. Podział danych – ustrukturyzowane, niestrukturyzowane + przechowywanie

[(link)](https://www.xplenty.com/blog/structured-vs-unstructured-data-key-differences/)

<https://itrexgroup.com/blog/your-unstructured-data/#header> Formaty i przechowywanie

* 1. Do czego wykorzystuje się dane – i te dobre i te złe strony i jak się wykorzystuje – wizualizacja, analiza, mapy, biznes value, w algorytmach AI i pokrewnych.

1. NLP
   1. Co to jest?
   2. …
   3. …
   4. …

RÓŻNE:

Firmy napędzane przez dane – data driven companies

<https://www.computerworld.pl/news/Firma-napedzana-przez-dane,409687.html>

“Data is the new **oil**.” The quote goes back to 2006, and is credited to Mathematician Clive Humby

2017 – w the economist o tym piszą:

<https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data>

<https://towardsdatascience.com/data-is-not-the-new-oil-bdb31f61bc2d>

Data is generated anytime someone searches, books a trip, clicks on an ad, or interacts in any other way with the content on the website.

*when dealing with data, it is far from clear how exactly to turn that data into profits*.

Data is incredibly noisy.

Istnieją zasadnicze różnice między danymi ustrukturyzowanymi i nieustrukturyzowanymi.

Koncepcja nowoczesnej sztucznej inteligencji ma swoje korzenie w pracach klasycznych filozofów, którzy próbowali opisać proces ludzkiego myślenia jako mechaniczną manipulację symbolami.

Momentem kulminacyjnym tych prac było wynalezienie w latach 40. XIX wieku programowalnego komputera cyfrowego bazującego na abstrakcyjnym rozumowaniu matematycznym. Urządzenie to i stojące za nim pomysły zainspirowały naukowców do dyskusji na temat możliwości zbudowania „mózgu elektronicznego”.

Jednak dziedzina badań nad sztuczną inteligencją została wyodrębniona dopiero w 1956 roku podczas warsztatów w Dartmouth College \cite{KAPLAN2019}.

Stadia sztucznej inteligencji:

1. Inteligencja słaba (wąska, poniżej możliwości mózgu ludzkiego)
2. Ogólna inteligencja (silna, możliwości podobne do mózgu ludzkiego)
3. Superinteligencja (inteligencja samoświadoma, powyżej możliwości ludzkiego mózgu)

TIMELINE

<https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence>

Klasyczni filozofowie 🡪 opisać proces ludzkiego myślenia jako mechaniczną manipulację symbolami (

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| **84 BC–322 BC** | [Aristotle](https://en.wikipedia.org/wiki/Aristotle" \o "Aristotle) described the [syllogism](https://en.wikipedia.org/wiki/Syllogism" \o "Syllogism), a method of formal, mechanical thought and theory of knowledge in [The Organon](https://en.wikipedia.org/wiki/The_Organon" \o "The Organon).[[4]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-4)[[5]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence#cite_note-5) |

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| **1275** | [Ramon Llull](https://en.wikipedia.org/wiki/Ramon_Llull), Spanish [theologian](https://en.wikipedia.org/wiki/Theology" \o "Theology), invents the *[Ars Magna](https://en.wikipedia.org/wiki/Ars_Magna_(Ramon_Llull)" \o "Ars Magna (Ramon Llull))*, a tool for combining concepts mechanically, based on an [Arabic astrological](https://en.wikipedia.org/wiki/Islamic_astrology" \o "Islamic astrology) tool, the [Zairja](https://en.wikipedia.org/wiki/Zairja" \o "Zairja). The method would be developed further by [Gottfried Leibniz](https://en.wikipedia.org/wiki/Gottfried_Leibniz" \o "Gottfried Leibniz) in the 17th century.[[10]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-10) |

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| **1620** | [Sir Francis Bacon](https://en.wikipedia.org/wiki/Sir_Francis_Bacon" \o "Sir Francis Bacon) developed empirical theory of knowledge and introduced inductive logic in his work [The New Organon](https://en.wikipedia.org/wiki/The_New_Organon" \o "The New Organon), a play on [Aristotle](https://en.wikipedia.org/wiki/Aristotle)'s title [The Organon](https://en.wikipedia.org/wiki/The_Organon" \o "Samuel Morland).[[14]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-14)[[15]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence#cite_note-15) |

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| **1642** | [Blaise Pascal](https://en.wikipedia.org/wiki/Blaise_Pascal" \o "Blaise Pascal) invented the [mechanical calculator](https://en.wikipedia.org/wiki/Mechanical_calculator" \o "Ramon Llull),[[19]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-19) the first [digital](https://en.wikipedia.org/wiki/Digital_data) [calculating machine](https://en.wikipedia.org/wiki/Pascal%27s_calculator" \o "Multiplication).[[20]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-20) |

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| **1672** | [Gottfried Leibniz](https://en.wikipedia.org/wiki/Gottfried_Leibniz" \o "Gottfried Leibniz) improved the earlier machines, making the [Stepped Reckoner](https://en.wikipedia.org/wiki/Stepped_Reckoner" \o "Pascal's calculator) to do [multiplication](https://en.wikipedia.org/wiki/Multiplication" \o "Digital data) and [division](https://en.wikipedia.org/wiki/Division_(mathematics)" \o "Division (mathematics)). He also invented the [binary numeral system](https://en.wikipedia.org/wiki/Binary_numeral_system" \o "Binary numeral system) and envisioned a universal calculus of reasoning ([alphabet of human thought](https://en.wikipedia.org/wiki/Alphabet_of_human_thought" \o "Alphabet of human thought)) by which arguments could be decided mechanically. [Leibniz](https://en.wikipedia.org/wiki/Gottfried_Leibniz" \o "Gottfried Leibniz) worked on assigning a specific number to each and every object in the world, as a prelude to an algebraic solution to all possible problems.[[21]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-21) |

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| **1822–1859** | [Charles Babbage](https://en.wikipedia.org/wiki/Charles_Babbage" \o "Charles Babbage) & [Ada Lovelace](https://en.wikipedia.org/wiki/Ada_Lovelace" \o "Ada Lovelace) worked on [programmable mechanical calculating machines](https://en.wikipedia.org/wiki/Difference_engine" \o "Difference engine).[[26]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-26) |

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| **1863** | [Samuel Butler](https://en.wikipedia.org/wiki/Samuel_Butler_(novelist)" \o "Samuel Butler (novelist)) suggested that [Darwinian](https://en.wikipedia.org/wiki/Charles_Darwin" \o "Charles Darwin) [evolution](https://en.wikipedia.org/wiki/Evolution" \o "Evolution) also applies to machines, and speculates that they will one day become conscious and eventually supplant humanity.[[29]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-29) |

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| **1943** | [Warren Sturgis McCulloch](https://en.wikipedia.org/wiki/Warren_Sturgis_McCulloch" \o "Warren Sturgis McCulloch) and [Walter Pitts](https://en.wikipedia.org/wiki/Walter_Pitts" \o "Walter Pitts) publish "A Logical Calculus of the Ideas Immanent in Nervous Activity" (1943), laying foundations for [artificial neural networks](https://en.wikipedia.org/wiki/Artificial_neural_network" \o "Artificial neural network).[[33]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-33) |
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| **1945** | [Game theory](https://en.wikipedia.org/wiki/Game_theory" \o "Game theory) which would prove invaluable in the progress of AI was introduced with the 1944 paper, [Theory of Games and Economic Behavior](https://en.wikipedia.org/wiki/Theory_of_Games_and_Economic_Behavior" \o "Ada Lovelace) by [mathematician](https://en.wikipedia.org/wiki/Mathematician" \o "Mathematician) [John von Neumann](https://en.wikipedia.org/wiki/John_von_Neumann" \o "John von Neumann) and [economist](https://en.wikipedia.org/wiki/Economist" \o "Economist) [Oskar Morgenstern](https://en.wikipedia.org/wiki/Oskar_Morgenstern). |
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| **1950** | [Alan Turing](https://en.wikipedia.org/wiki/Alan_Turing" \o "Alan Turing) proposes the [Turing Test](https://en.wikipedia.org/wiki/Turing_Test" \o "Turing Test) as a measure of machine intelligence.[[34]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-34) |
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| **1951** | The first working AI programs were written in 1951 to run on the [Ferranti Mark 1](https://en.wikipedia.org/wiki/Ferranti_Mark_1" \o "Ferranti Mark 1) machine of the [University of Manchester](https://en.wikipedia.org/wiki/University_of_Manchester" \o "University of Manchester): a checkers-playing program written by [Christopher Strachey](https://en.wikipedia.org/wiki/Christopher_Strachey" \o "Christopher Strachey) and a chess-playing program written by [Dietrich Prinz](https://en.wikipedia.org/wiki/Dietrich_Prinz" \o "Dietrich Prinz). |

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| **1956** | The [Dartmouth College](https://en.wikipedia.org/wiki/Dartmouth_College" \o "Dartmouth College) [summer AI conference](https://en.wikipedia.org/wiki/Dartmouth_workshop" \o "Dartmouth workshop) is organized by [John McCarthy](https://en.wikipedia.org/wiki/John_McCarthy_(computer_scientist)), [Marvin Minsky](https://en.wikipedia.org/wiki/Marvin_Minsky" \o "Marvin Minsky), [Nathan Rochester](https://en.wikipedia.org/wiki/Nathan_Rochester" \o "Nathan Rochester) of [IBM](https://en.wikipedia.org/wiki/International_Business_Machines" \o "International Business Machines) and [Claude Shannon](https://en.wikipedia.org/wiki/Claude_Shannon" \o "Herbert A. Simon). McCarthy coins the term *artificial intelligence* for the conference.[[37]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence#cite_note-37) |
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| **Late 1950s, early 1960s** | [Margaret Masterman](https://en.wikipedia.org/wiki/Margaret_Masterman" \o "Margaret Masterman) and colleagues at [University of Cambridge](https://en.wikipedia.org/wiki/University_of_Cambridge" \o "University of Cambridge) design [semantic nets](https://en.wikipedia.org/wiki/Lexical_semantics" \o "Lexical semantics) for [machine translation](https://en.wikipedia.org/wiki/Machine_translation" \o "Machine translation). |

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|  | 1963  [Leonard Uhr](https://en.wikipedia.org/wiki/Leonard_Uhr" \o "Leonard Uhr) and Charles Vossler published "A Pattern Recognition Program That Generates, Evaluates, and Adjusts Its Own Operators", which described one of the first machine learning programs that could adaptively acquire and modify features and thereby overcome the limitations of simple perceptrons of [Rosenblatt](https://en.wikipedia.org/wiki/Frank_Rosenblatt" \o "Frank Rosenblatt). |

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| **1964** | Danny Bobrow's dissertation at MIT (technical report #1 from MIT's AI group, [Project MAC](https://en.wikipedia.org/wiki/Project_MAC" \o "Project MAC)), shows that computers can understand natural language well enough to solve [algebra](https://en.wikipedia.org/wiki/Algebra" \o "Algebra) [word problems](https://en.wikipedia.org/wiki/Word_problem_(mathematics_education)" \o "Word problem (mathematics education)) correctly. |
|  |

1965

[Joseph Weizenbaum](https://en.wikipedia.org/wiki/Joseph_Weizenbaum" \o "Joseph Weizenbaum) (MIT) built [ELIZA](https://en.wikipedia.org/wiki/ELIZA" \o "ELIZA), an [interactive program](https://en.wikipedia.org/wiki/Interactivity" \o "Interactivity) that carries on a dialogue in [English language](https://en.wikipedia.org/wiki/English_language" \o "English language) on any topic. It was a popular toy at AI centers on the [ARPANET](https://en.wikipedia.org/wiki/ARPANET" \o "ARPANET) when a version that "simulated" the dialogue of a [psychotherapist](https://en.wikipedia.org/wiki/Psychotherapy" \o "Psychotherapy) was programmed.

1966

Negative report on machine translation kills much work in [Natural language processing](https://en.wikipedia.org/wiki/Natural_language_processing" \o "Natural language processing) (NLP) for many years.

1969

First International Joint Conference on Artificial Intelligence ([IJCAI](https://en.wikipedia.org/wiki/IJCAI" \o "IJCAI)) held at Stanford.

Też odkrycia zasmucające

Marvin Minsky and [Seymour Papert](https://en.wikipedia.org/wiki/Seymour_Papert) publish *[Perceptrons](https://en.wikipedia.org/wiki/Perceptrons_(book)" \o "Perceptrons (book))*, demonstrating previously unrecognized limits of this feed-forward two-layered structure, and This book is considered by some to mark the beginning of the [AI winter](https://en.wikipedia.org/wiki/AI_winter" \o "AI winter) of the 1970s, a failure of confidence and funding for AI. Nevertheless, significant progress in the field continued (see below).

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| **Early 1970s** | Jane Robinson and Don Walker established an influential [Natural Language Processing](https://en.wikipedia.org/wiki/Natural_Language_Processing) group at SRI. |
| **1970** | [Seppo Linnainmaa](https://en.wikipedia.org/wiki/Seppo_Linnainmaa" \o "Seppo Linnainmaa) publishes the reverse mode of [automatic differentiation](https://en.wikipedia.org/wiki/Automatic_differentiation" \o "Automatic differentiation). This method became later known as [backpropagation](https://en.wikipedia.org/wiki/Backpropagation" \o "Backpropagation), and is heavily used to train [artificial neural networks](https://en.wikipedia.org/wiki/Artificial_neural_networks" \o "Logic Theorist). |
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1975

Marvin Minsky published his widely read and influential article on [Frames](https://en.wikipedia.org/wiki/Frame_problem" \o "Frame problem) as a representation of knowledge, in which many ideas about [schemas](https://en.wikipedia.org/wiki/Schema_(psychology)" \o "Schema (psychology)) and [semantic links](https://en.wikipedia.org/wiki/Semantic_link" \o "Semantic link) are brought together.

1979

The Stanford Cart, built by [Hans Moravec](https://en.wikipedia.org/wiki/Hans_Moravec" \o "Hans Moravec), becomes the first computer-controlled, [autonomous vehicle](https://en.wikipedia.org/wiki/Autonomous_robot" \o "Autonomous robot) when it successfully traverses a chair-filled room and circumnavigates the [Stanford AI Lab](https://en.wikipedia.org/wiki/Stanford_AI_Lab" \o "Stanford AI Lab).

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| **1980** | First National Conference of the [American Association for Artificial Intelligence](https://en.wikipedia.org/wiki/American_Association_for_Artificial_Intelligence" \o "American Association for Artificial Intelligence) (AAAI) held at Stanford. |

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| **Mid-1980s** | Neural Networks become widely used with the [Backpropagation](https://en.wikipedia.org/wiki/Backpropagation" \o "Backpropagation) [algorithm](https://en.wikipedia.org/wiki/Algorithm" \o "Algorithm), also known as the reverse mode of [automatic differentiation](https://en.wikipedia.org/wiki/Automatic_differentiation) published by [Seppo Linnainmaa](https://en.wikipedia.org/wiki/Seppo_Linnainmaa" \o "Seppo Linnainmaa) in 1970 and applied to neural networks by [Paul Werbos](https://en.wikipedia.org/wiki/Paul_Werbos" \o "Natural Language Processing). |

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| **1990s** | Major advances in all areas of AI, with significant demonstrations in machine learning, [intelligent tutoring](https://en.wikipedia.org/wiki/Computer_assisted_instruction" \o "Computer assisted instruction), case-based reasoning, multi-agent planning, [scheduling](https://en.wikipedia.org/wiki/Scheduling_(computing)" \o "Scheduling (computing)), uncertain reasoning, [data mining](https://en.wikipedia.org/wiki/Data_mining" \o "Data mining), natural language understanding and translation, vision, [virtual reality](https://en.wikipedia.org/wiki/Virtual_reality" \o "Virtual reality), games, and other topics. |

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| **1993** | [Ian Horswill](https://en.wikipedia.org/w/index.php?title=Ian_Horswill&action=edit&redlink=1" \o "Ian Horswill (page does not exist)) extended [behavior-based robotics](https://en.wikipedia.org/wiki/Behavior-based_robotics" \o "Behavior-based robotics) by creating [Polly](https://en.wikipedia.org/wiki/Polly_(robot)" \o "Polly (robot)), the first robot to navigate using [vision](https://en.wikipedia.org/wiki/Computer_vision" \o "Computer vision) and operate at animal-like speeds (1 meter/second). |
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1993 DART -

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| ISX corporation wins "DARPA contractor of the year"[[47]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-47) for the [Dynamic Analysis and Replanning Tool](https://en.wikipedia.org/wiki/Dynamic_Analysis_and_Replanning_Tool" \o "Dynamic Analysis and Replanning Tool) (DART) which reportedly repaid the US government's entire investment in AI research since the 1950s.[[48]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-48) |

90te lata – autonomiczne samochody, boty grające w gry i wygrywające, roboty z wizją

2000 lata – robozwierzęta, irobot roomba, Spirit i opportunity (NASA) autonomiczna eksploracja Marsa, roboty humanoidalne, systemy rekomendacyjne

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| **2008** | Cynthia Mason at Stanford presents her idea on Artificial Compassionate Intelligence, in her paper on ["Giving Robots Compassion"](https://www.researchgate.net/publication/260230014_Giving_Robots_Compassion_C_Mason_Conference_on_Science_and_Compassion_Poster_Session_Telluride_Colorado_2012).[[60]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-60) |
| **2009** | [Google](https://en.wikipedia.org/wiki/Google) builds autonomous car.[[61]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence#cite_note-61) |

2010-te lata

Wizja komputerowa – kinnect xboxa – 2010

Narzędzia NLP – rozpoznawanie I przetwarzanie.

2011 – Siri

2012 – asystent googla

2014 – Microsoft Cortana

2015 - [Google](https://en.wikipedia.org/wiki/Google" \o "Google) [DeepMind](https://en.wikipedia.org/wiki/Google_DeepMind" \o "Google DeepMind)'s [AlphaGo](https://en.wikipedia.org/wiki/AlphaGo" \o "AlphaGo) (version: Fan)[[68]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-:0-68) defeated 3 time European Go champion 2 dan professional [Fan Hui](https://en.wikipedia.org/wiki/Fan_Hui" \o "Fan Hui) by 5 games to 0.[[69]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-69)

ETYKA:

2015- An open letter to ban development and use of autonomous weapons signed by [Hawking](https://en.wikipedia.org/wiki/Stephen_Hawking" \o "Stephen Hawking), [Musk](https://en.wikipedia.org/wiki/Elon_Musk" \o "Elon Musk), [Wozniak](https://en.wikipedia.org/wiki/Steve_Wozniak" \o "Rodney Brooks) and 3,000 researchers in AI and robotics.[[67]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-67)

2017 – konferencje o etyce AI -

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| **2017** | [Asilomar Conference on Beneficial AI](https://en.wikipedia.org/wiki/Asilomar_Conference_on_Beneficial_AI" \o "AlphaGo) was held, to discuss [AI ethics](https://en.wikipedia.org/wiki/AI_ethics" \o "AI ethics) and how to bring about [beneficial AI](https://en.wikipedia.org/wiki/Beneficial_AI" \o "Beneficial AI) while avoiding the [existential risk from artificial general intelligence](https://en.wikipedia.org/wiki/Existential_risk_from_artificial_general_intelligence). |
|  |

2020

[OpenAI](https://en.wikipedia.org/wiki/OpenAI" \o "OpenAI)'s [GPT-3](https://en.wikipedia.org/wiki/GPT-3), a state-of-the-art autoregressive language model that uses [deep learning](https://en.wikipedia.org/wiki/Deep_learning" \o "Deep learning) to produce a variety of computer codes, poetry and other language tasks exceptionally similar, and almost indistinguishable from those written by humans. Its capacity was ten times greater than that of the T-NLG. It was introduced in May 2020,[[82]](https://en.wikipedia.org/wiki/Timeline_of_artificial_intelligence" \l "cite_note-arXiv_Brown_20200722-82) and was in beta testing in June 2020.

Sztuczna inteligencja (AI) --- jest definiowana jako zdolność systemu do poprawnej

interpretacji danych zewnętrznych, uczenia się na podstawie takich danych oraz wykorzystywania tych informacji do osiągania konkretnych celów i zadań wykorzystując elastyczną adaptację.

In unsupervised learning there are no classes defined a-priori. The algorithm itself divides the instances into different classes and finds descriptions for these classes. This process is often also referred to as clustering. The resulting rules will be a summary of some properties of the instances in the database: which classes are present and what differentiates them. However, this will only be what the algorithm has found. There may be many other ways of dividing the instances into classes and of describing each class.

Surowe dane

Name: review, dtype: object

Zamiana labeli na numeryczne

labels = data.iloc[0:, -1]

labels = labels.replace("negative", 0)

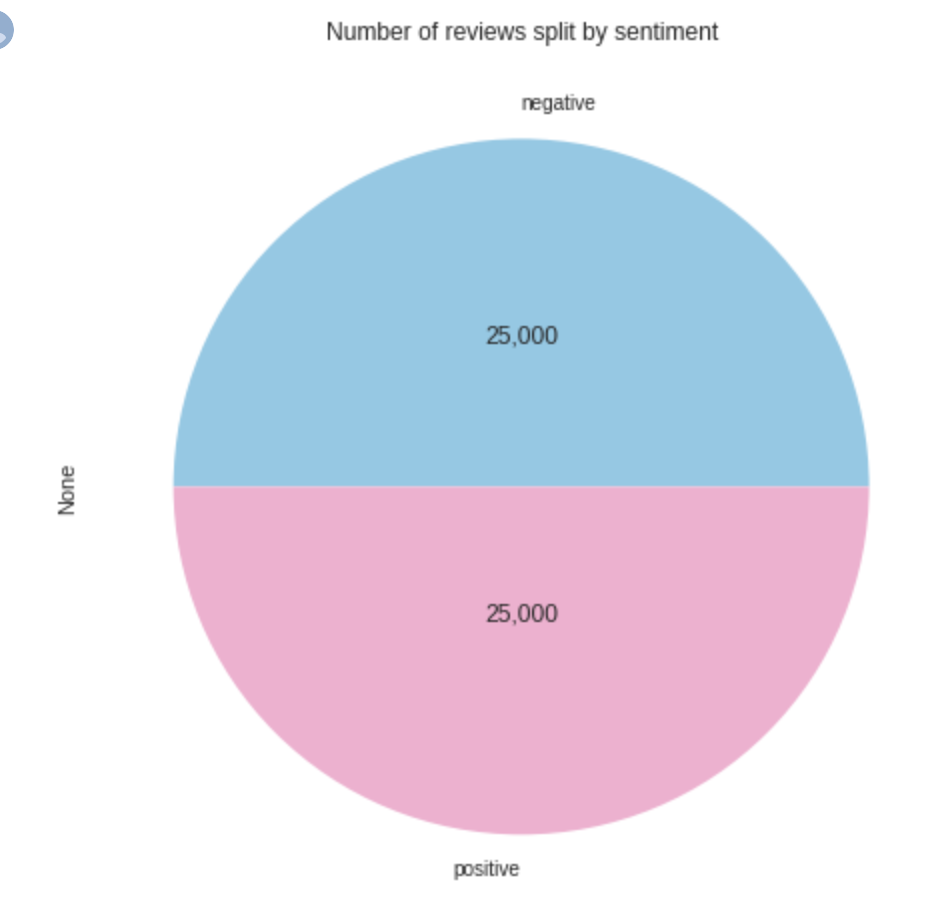
labels = labels.replace("positive", 1)

labels.head()

Name: sentiment, dtype: int64

Usunięcie tagów HTML przy pomocy funkcji lamdba z BeautifulSoup

Wizualizacja pokazująca, że jest balanced set



Następnie train\_test\_split

80 (treningowy) do 20 (testowy) i kontrolne sprawdzenie „balance’u”, czy jest mniej więcej też pół na pół pozytywnych i negatywnych w zbiorach treningowych i testowych.

Usunięcie stop words

Na podstawie tych zdefiniowanych w nltk i powiększonych o cudzysłowy

english\_stopwords = set(stopwords.words('english') + list(punctuation) + ['“', '”', '’'])

Później simple count vectorization

from sklearn.feature\_extraction.text import CountVectorizer

count\_vectorizer = CountVectorizer(stop\_words=english\_stopwords)

train\_data\_count = count\_vectorizer.fit\_transform(train\_data)

test\_data\_count = count\_vectorizer.transform(test\_data)

Przykładowa wizualizacja częstości występowania słów

from yellowbrick.text import FreqDistVisualizer