August 2025

PCC CHEM NEWS

Newsletter of the PCC Rokita Capital Group and affiliated companies

Summer Edition

PCC CHEM NEWS

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Modern eletric TRAXX with the new

PCC logo hits the tracks!

We are excited to share wonderful news - the first PCC Intermodal locomotive in a brand-new look has just hit the tracks.

Our fresh colors and the new PCC Group logo, together with the slogan Local. Global. Integrated., are now proudly on display! This marks a symbol of our growth, fresh energy, and the next step towards modern and sustainable transport. And there's more! Very soon, on PCC Intermodal's Facebook profile, we'll be launching a contest for railway and photography enthusiasts. If you spot our new locomotive on a warm summer evening and capture it with your camera - exciting prizes await! Join us in celebrating this milestone and share your best shots with us.

Monika Konsor-Fąferek
PCC Intermodal

PCC Group

Open Day 2025

For ten years, PCC Group has been hosting Open Days for university students. This is a unique opportunity for young chemistry enthusiasts to get to know the company from the inside and see what working in a modern chemical enterprise looks like.

This year, the event took place on April 25, 2025, and was attended by around 100 students from the Wrocław University of Science and Technology, Silesian University of Technology, and Częstochowa University of Technology. The Open Day program included presentations about the company and student-oriented programs such as the Summer Internship Program and the Scholarship Program. Participants toured selected production departments and observed chemical installations in action. Students also visited R&D laboratories, where they had the chance to see modern equipment in use and learn about the challenges of industrial-scale chemical production. Additionally, participants met PCC specialists and explored career development opportunities within the company.

The event also included educational games and competitions. Students eagerly participated in the Chemiliada, testing their chemical knowledge in an interactive way.

The Open Day was an excellent opportunity to inspire young talents and showcase career possibilities in the chemical industry.

Statistics and Feedback:

- **91,86**% of surveyed students rated the event as Excellent or Very Good.
- **8,33**% rated it as Good.
- **93**% would recommend the event to other students.
- **87,5**% stated that they became more interested in the company's programs after the visit.

Many students have already decided to start internships with PCC Group in summer 2025.

We thank everyone who helped organize the event and the students for their active participation and curiosity about chemistry. We look forward to the next edition in 2026, so more students can discover the secrets of our chemical magic. **Together, let's build a bridge between science and industry!**

Student Feedback:

„Everything was very well organized. If possible, I'll come back next year to see a different installation."

„The team was organized, and the company's opportunities were well presented. It definitely encouraged me to learn more about the company :)"

What students enjoyed the most?

„The chance to ask questions, meet scholarship holders, and tour the workplace."

„The tour itself, everything was well-prepared, and the atmosphere was wonderful."

„Friendly approach of employees, relaxed atmosphere, fun activities."

„Interesting presentations by employees from selected departments, great lunch offerings, and a nice snack :)"

Dział Personalny
CWB Partner

Tasty break

- new solutions for employees in Brzeg Dolny

We are pleased to announce that a new food ordering option is now available for employees at PCC Group in Brzeg Dolny. Employees can now conveniently pick up meals at several points across the company or use food and beverage vending machines.

This new solution allows everyone to quickly and easily access fresh sandwiches, salads, lunches, snacks, and drinks, no matter which building they are in. Meals can be purchased on-site or ordered in advance, making it easier to plan breaks and save time. This initiative is part of PCC Group's ongoing efforts to provide greater convenience and comfort to employees during their workday. We encourage everyone to take advantage of this new option and enjoy fresh meals without leaving the company premises.

Dział Personalny
CWB Partner

Visit us

at Industry Events!

**We'll soon be present at leading trade fairs and conferences,
where we'll showcase our latest solutions.
It's a great opportunity to meet our team, discuss potential collaborations,
and explore our products up close.**

Find us - we look forward to seeing you!

FEICA

10 - 12 September 2025
Kursall Congress Centre
San Sebastian, Spain
Stand: 32

LUBRICANT EXPO

16 - 18 September 2025
Messe Düsseldorf, Germany
Stand: 607

EPCA

22 - 25 September 2025
Sana Berlin Hotel
Berlin, Germany

HPCI

24 - 25 September 2025
Expo XII
Warsaw, Poland
Stand: 211

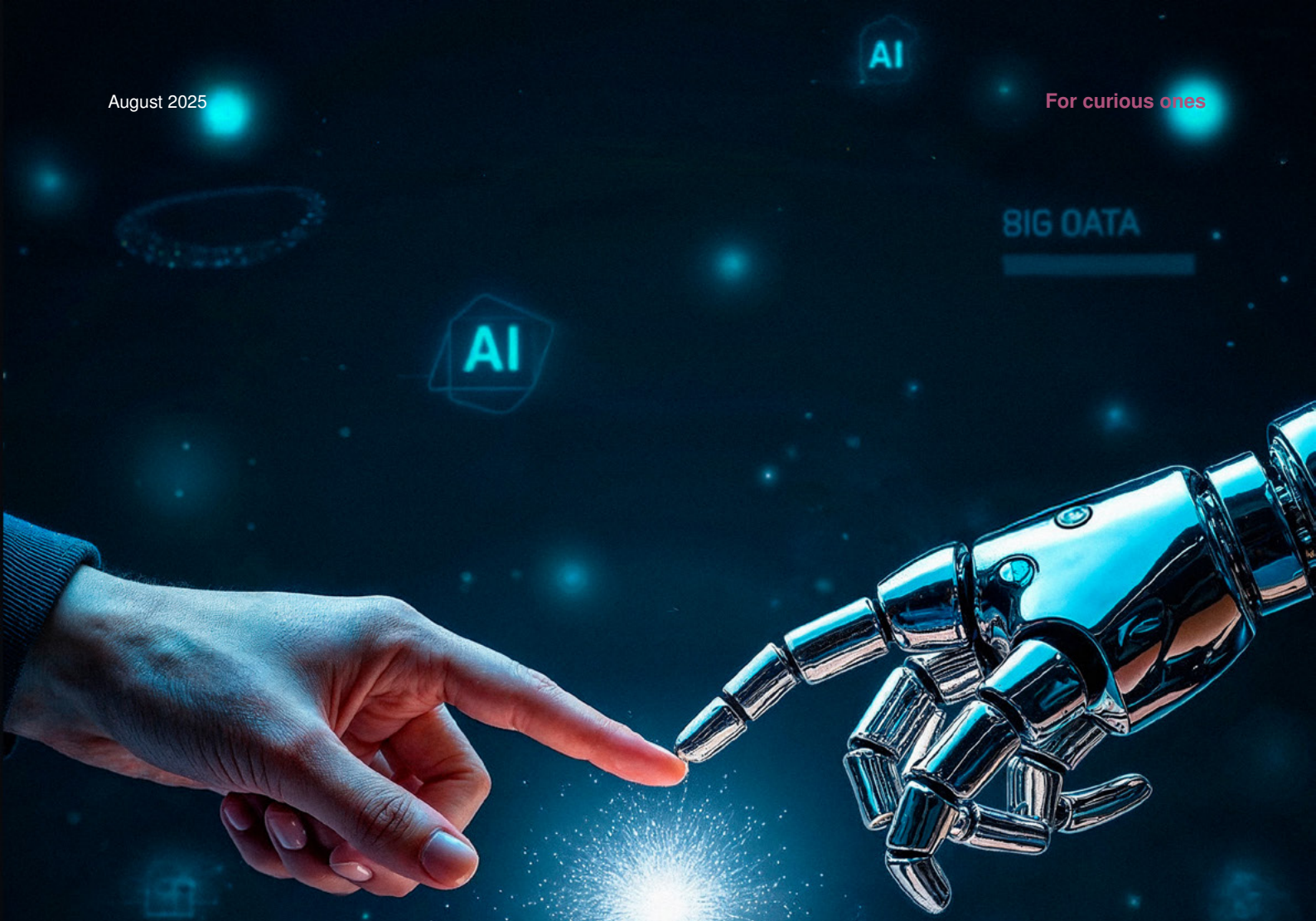
PAINT & COATINGS

9 October 2025
Superstudio Maxi
Milan, Italy
Stand: 531

SEPAWA

15 - 17 October 2025
Estrel Congress Center
Berlin, Germany
Stand: A144-145, A151-152

Magdalena Jaroszewska
PCC Rokita



From Tokens to Hallucinations:

How Artificial Intelligence Really Works?

**Artificial intelligence can write texts, answer questions,
and even hold conversations as if it truly understands what it's talking about.
But does it really understand?
In this article, we'll break down, step by step, how AI processes language
- from breaking words into tokens, analyzing context,
to the moments when it… starts to make things up.**

Fun fact:

AI can cluster not only nouns but also emotions, colors, and even slang expressions - depending on the data it was trained on.

How Does AI „Understand" Text?

Every interaction with AI begins by breaking text into smaller pieces. This process is called **tokenization**. For a computer, it's like looking at words under a magnifying glass - it divides them into parts that are easier to process.

Once the text is broken down, the next step is converting words into numbers - called **embeddings**. These allow AI to "understand" that the word "dog" is more closely related to "cat" than to "computer," even if it doesn't know their definitions.

AI doesn't just assign numbers to words; it can also group conceptually similar words. This is called **clustering** - words like "train," "bus," and "car" fall into one group (vehicles), while "walking," "swimming," "running" go into another (sports). In this way, AI begins to "understand" that certain words have similar meanings and often appear in similar contexts.

Context is what allows AI to truly grasp language. The model analyzes billions of examples and learns that the meaning of a word can change depending on its surroundings. For instance, "castle" means something different in a sentence about knights than when talking about a zipper on a jacket. This is made possible by the **self-attention** mechanism, which helps the model distinguish these differences.

Example of tokenization:
["Tollens" "test" "allows" "detection" "of" "aldehydes"]
AI breaks the text into smaller elements that are easier to analyze.

Embedding is the way AI "translates" words, sentences, or other data into numbers. Each text element is converted into vectors representing its meaning in a mathematical space. This allows the model to recognize that words like "cat" and "dog" are similar, while "cat" and "airplane" are very different. Embeddings enable AI to operate numerically and detect similarities between concepts.

Why AI Can Keep Context: Self-Attention in Action

One of the key technologies is **self-attention**. It allows the model to „pay attention" to which words in a sentence are most important, helping it understand meaning and respond appropriately.

Self-attention analyzes each token and evaluates which other parts of the text are crucial to understanding it correctly. Essentially, AI looks at the whole sentence and "weights" which words have the greatest impact on the meaning of a passage.

Example: the word „test" in two sentences:
1. „The Tollens test allows detection of aldehydes." – here, the model recognizes a chemical reaction.
2. „The exam test was difficult." – here, "test" means an attempt at an exam.

By analyzing context, the model focuses on words like „Tollens," „result," „aldehyde" in the first sentence, and „student," „exam," „passing" in the second.

Fun fact:

The Transformer model was introduced in 2017 by Google labs. Its creators famously said, "Attention is all you need." This model first implemented self-attention, replacing slower language models and becoming the foundation of most modern AI systems, like ChatGPT.

Errors and Hallucinations - When AI Makes Things Up

Even though AI can sound convincing, it doesn't truly understand content and has no real knowledge. It works statistically on text patterns. When data is missing, it can fabricate information- producing answers that sound plausible but are false.

Hallucinations may seem harmless in creative writing, but in legal, medical, or educational contexts, they can have serious consequences - from misinformation to ethical violations.

Common causes of hallucinations:
- insufficient data on a topic,
- vague or contradictory instructions,
- the need to "complete" a thought statistically, even if false.

To reduce hallucinations, techniques like **grounding** (using real-world data), reinforcement learning with human feedback (RLHF), and **retrieval-augmented generation (RAG)** - where AI consults external knowledge in real time - are used.

Even with these methods, hallucinations don't disappear completely. That's why AI outputs should be treated carefully - as suggestions, not unquestionable facts.

How AI Generates Text: Statistics, Not Magic

AI generates text by predicting the next word. The model analyzes which words most frequently follow one another in billions of texts and selects the most likely fit.

The simplest method - **greedy search** - always picks the most probable word. It's fast but can be predictable.

A more advanced approach - **beam search** - considers multiple paths simultaneously, choosing the one that produces the most coherent text.

Example:
In 2023, a US lawyer filed a lawsuit citing court cases generated by ChatGPT. None of these cases actually existed.

Source: theguardian.com

Conclusion

AI is a powerful tool, not magic. It works based on advanced mathematics, statistics, and massive amounts of data–it doesn't possess consciousness or true understanding.

Despite limitations, AI has enormous potential: it can aid writing, data analysis, programming, and many other fields. The key is understanding how it works and using it wisely.

Kamil Plewka
PCC Rokita

Goldenrod

- the Summer Gold of Polish Meadows

What we often have in abundance around us is easy to overlook. Among Poland's wild plants, goldenrod is a perfect example. Almost everyone has heard the name, but fewer can identify it, and even fewer know its different species.

In Poland, three species of goldenrod are most common: European goldenrod (Solidago virgaurea), Canadian goldenrod (Solidago canadensis) and Giant goldenrod (Solidago gigantea). All of them have dense, golden-yellow flower clusters, but differ in size, habitat, and blooming season.

European goldenrod - native species, grows 40–100 cm tall, blooms July–September, thrives in dry meadows, forests, and thickets.

Canadian goldenrod - invasive, up to 2 m tall, blooms August–September, prefers moist areas, often found along roads and wastelands.

Giant goldenrod - also invasive, similar in height to Canadian, blooms July–September, has broad leaves and highly branched inflorescences.

Goldenrod (especially Canadian and Giant) is often considered a weed and invasive plant. It spreads widely across fields, meadows, wastelands, and even gardens. Its golden-yellow blossoms are a feast for the eyes, and beekeepers value it for its rich pollen, which produces goldenrod honey, mostly in late summer.

Uses of Goldenrod

Infusion - supports urinary tract health, has diuretic properties, helps prevent kidney stones.

Decoctions & rinses - applied externally for wounds, ulcers, burns, and as a mouthwash for oral inflammations.

Herbal blends - thanks to its flavonoids (notably hyperoside), it supports liver function, digestion, and detoxification.

Both leaves, stems, and flowers (collectively known as the herb) are valuable – roots are not used. The dried plant makes fragrant teas with a mild honey-like taste.

Health Benefits

- anti-inflammatory, diaphoretic, immune-boosting (useful for colds and flu),
- highly effective for urinary tract inflammations, often more effective than antibiotics,
- supports liver function, digestion, and detox,
- antioxidant properties, beneficial for cardiovascular health,
- external use: promotes wound healing, treats acne and skin inflammation.

Why is it so effective?

The secret lies in its phytochemistry. Goldenrod contains flavonoids (rutin, quercetin, hyperoside), phenolic acids, saponins, tannins, and essential oils. Flowers – high in rutin, strong antioxidant activity.

Leaves – rich in hyperoside, stronger anti-inflammatory and detoxifying effects. Research suggests hyperoside may also help reduce stress and alleviate mild depression. Goldenrod honey, rich in pollen-derived phytochemicals, offers similar health benefits.

Let's make use of the gifts nature offers us. To your health!

Marta Kowalewska
PCC Rokita
(a naturopath in her free time)

The PCC Group

Team Adventure at Runmageddon in Wrocław

Dust rising above the track, sporting emotions and a huge sense of achievement - that's how the PCC Group team experienced Runmageddon at Partynice.

Everyone took part in the Rekrut category, which required not only physical fitness but also determination and strong teamwork. The course was full of challenges: climbing high obstacles, crawling through narrow passages, balancing, and strength-based tasks. Some moments were so demanding that they could only be overcome with mutual support. This is where the true power of the group shone through – collaboration and trust. Every helping hand, every word of encouragement and every shared "we can do this!" gave energy and motivation to keep going.

Although the track was covered with dust and each step required effort, it only added to the adventure. The unique atmosphere turned every obstacle into an unforgettable experience.

Runmageddon proved to be not just a sporting challenge, but also a great opportunity for integration. Overcoming difficulties together, sharing laughter and celebrating the finish line created memories that will last a long time. It showed that when people join forces, they can achieve much more – and even the toughest challenges become easier when faced as a team.

Beata Krok
PCC Rokita

The Natural Laboratory *of Lower Silesia*

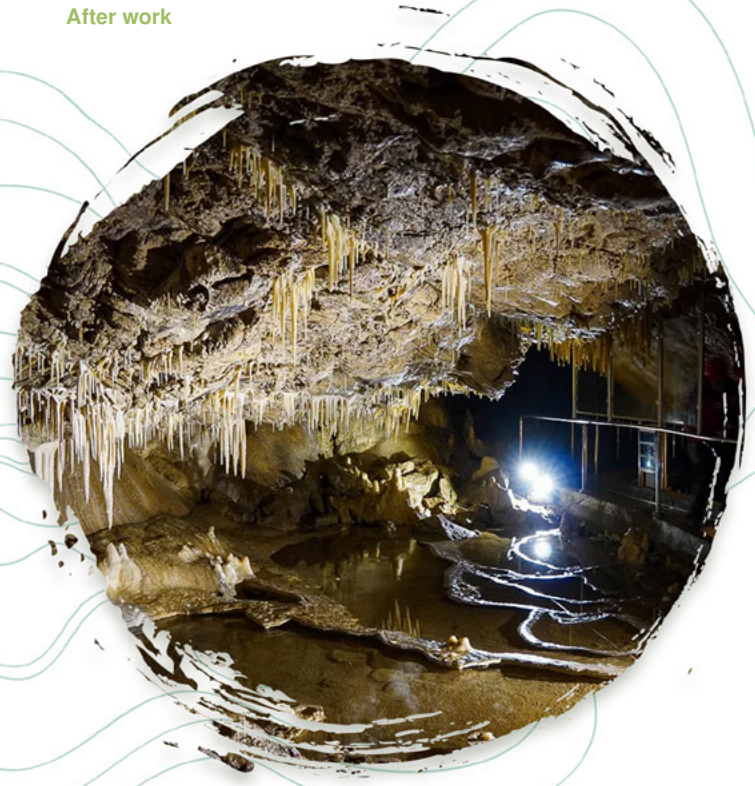
Lower Silesia can truly be described as a natural laboratory. Rich in minerals, diverse geology, and unique natural phenomena, the region turns every holiday into a fascinating field study. Instead of traveling far, one can explore local destinations where nature itself performs chemical experiments.

The Colorful Lakes in the Rudawy Janowickie - shades of chemical reactions

Emerald, blue, and purple waters result from sulfur, copper, and other minerals. This is a spectacular example of chemistry painting the landscape.

Szczawno-Zdrój and Kudowa-Zdrój - springs full of minerals

Waters rich in magnesium, calcium, and bicarbonates act like natural healing solutions. Walking through spa parks, you can literally feel the elements at work.



Bear Cave in Kletno - crystallization in practice

Stalactites and stalagmites made of calcium carbonate are a natural record of chemical reactions lasting thousands of years. It is one of Poland's most valuable geological archives.

Złoty Stok - gold and the chemistry of history

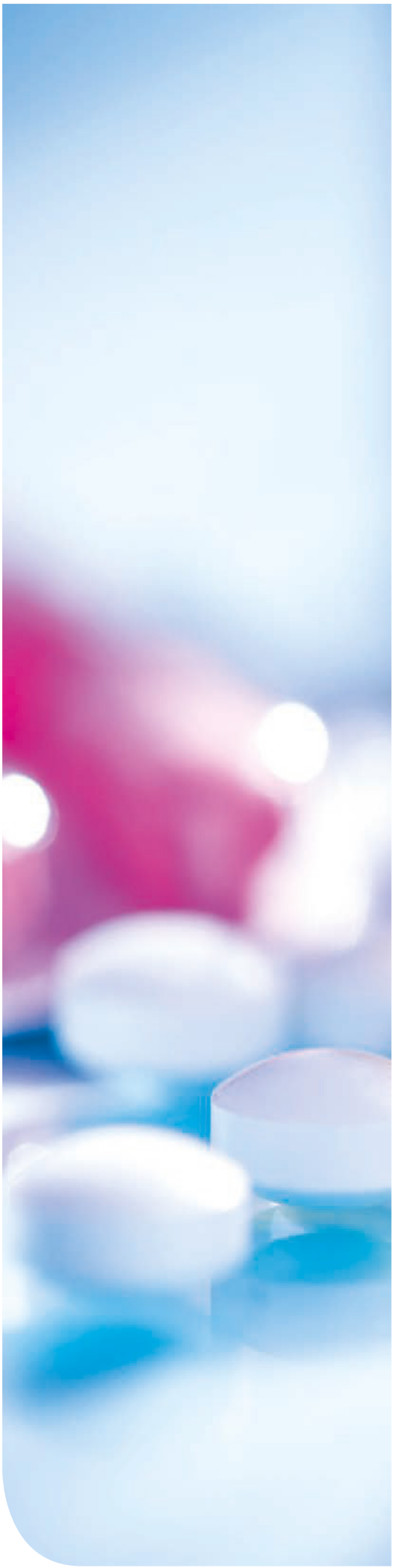
The former gold mine allows you to explore both the underground and the past. Gold, arsenic, and other elements accompanied humans here for centuries and today tell the story of old mining experiments.

Błędne Skały in the Stołowe Mountains - a crystal-like structure

This sandstone labyrinth looks like an enlarged crystal structure. Narrow passages and monumental rock blocks showcase the pure architecture of nature.

Lower Silesia is a place where every holiday becomes an expedition of discovery – an open-air laboratory where chemistry and geology meet relaxation and summer energy.

Beata Krok
PCC Rokita



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