

# Knowledge Graph Generation Task

## Instructions:

- You are required to automate the extraction of the Wikipedia text.
- You are NOT required to store the final graph in any graph databases.
- While Python is recommended, you may use any programming languages and libraries/frameworks of your choice.
- Submit your code along with all results [here](#)

**Task 1:** Visit the following Wikipedia page: <https://en.wikipedia.org/wiki/Paracetamol>

## Paracetamol

From Wikipedia, the free encyclopedia

**Paracetamol**, also known as **acetaminophen**,<sup>[a]</sup> is a **medication** used to treat **fever** and mild to moderate **pain**.<sup>[12][13]</sup> Common brand names include Tylenol and Panadol.

At a standard dose, paracetamol only slightly decreases body temperature;<sup>[12][14][15]</sup> it is inferior to **ibuprofen** in that respect,<sup>[16]</sup> and the benefits of its use for fever are unclear.<sup>[12][17][18]</sup> Paracetamol may relieve pain in acute mild **migraine** but only slightly in episodic **tension headache**.<sup>[19][20]</sup> However, the **aspirin/paracetamol/caffeine** combination helps with both conditions where the pain is mild and is recommended as a **first-line treatment** for them.<sup>[21][22]</sup> Paracetamol is effective for post-surgical pain, but it is inferior to ibuprofen.<sup>[23]</sup> The paracetamol/ibuprofen combination provides further increase in potency and is superior to either **drug** alone.<sup>[23][24]</sup> The pain relief paracetamol provides in **osteoarthritis** is small and clinically insignificant.<sup>[13][25][26]</sup> The evidence in its favor for the use in low back pain, **cancer pain**, and **neuropathic pain** is insufficient.<sup>[13][27][25][28][29][30]</sup>

In the short term, common side effects of paracetamol are **nausea** and abdominal pain, and it seems to have tolerability similar to ibuprofen.<sup>[31][32]</sup> Chronic consumption of paracetamol may result in a drop in **hemoglobin** level, indicating possible **gastrointestinal bleeding**,<sup>[33]</sup> and **abnormal liver function tests**.<sup>[34]</sup> There is a consistent association of increased **mortality** as well as **cardiovascular** (stroke, myocardial infarction), gastrointestinal (ulcers, bleeding) and **renal** adverse effects with taking higher dose of paracetamol.<sup>[33][32][35]</sup> The drug may also increase the risk of developing **hypertension**.<sup>[36][37]</sup> Elevated frequency of **asthma** and developmental and reproductive disorders is observed in the offspring of women with prolonged use of paracetamol during **pregnancy**, although whether paracetamol is the true cause of this increase is unclear.<sup>[36]</sup> Some studies suggest that there is evidence for the association between paracetamol during pregnancy and **autism spectrum disorder** and **attention deficit hyperactivity disorder**, while making clear further research is required to establish any causal link,<sup>[38][39]</sup> which has prompted some calls to limit its use in pregnancy to the lowest effective dosage for the shortest possible time.<sup>[36][40][41]</sup>

The recommended maximum daily dose for an adult is three to four grams.<sup>[42][43][25]</sup> Higher doses may lead to toxicity, including **liver failure**.<sup>[44]</sup> **Paracetamol poisoning** is the foremost cause of **acute liver failure** in the **Western world**, and accounts for most drug overdoses in the United States, the United Kingdom, Australia, and New Zealand.<sup>[45][46][47]</sup>

Paracetamol was first made in 1877 or possibly 1852.<sup>[48][49][50]</sup> It is the most commonly used medication for pain and fever in both the United States and Europe.<sup>[51]</sup> It is on the **World Health Organization's List of Essential Medicines**.<sup>[52]</sup> Paracetamol is available as a **generic medication**, with brand names including **Tylenol** and **Panadol** among others.<sup>[53]</sup> In 2019, it was the 145th most commonly prescribed medication in the United States, with more than 4 million prescriptions.<sup>[54][55]</sup>

Figure 1: Text Extract Sample

**Task 2:** Create a knowledge graph from the text extract (boxed in Red) shown in Figure 1.

**Deliverable:**

- List of extracted triples in the form of:

(subject, predicate, object)   OR   (source, relation, target)

Example:

[("paracetamol", "medication", "fever"), ("common brand names", "include", "tylenol"), ...]

- A graph visualization
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**References to get you started:**

- <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8874979>
  - [https://web.stanford.edu/~vinayc/kg/notes/What\\_is\\_a\\_Knowledge\\_Graph.html](https://web.stanford.edu/~vinayc/kg/notes/What_is_a_Knowledge_Graph.html)
  - <https://www.analyticsvidhya.com/blog/2019/10/how-to-build-knowledge-graph-text-using-spacy/>
  - <https://neo4j.com/blog/text-to-knowledge-graph-information-extraction-pipeline/>
  - <https://towardsdatascience.com/from-text-to-knowledge-the-information-extraction-pipeline-b65e7e30273e>
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