

# ECL1

## Exercise 05

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# 1

## 1.1

- a)
- b)
- c)

This is not a CFG. It has a string (i.e. a terminal) on the left, which is not allowed. There has to be a single non-terminal on the left of the arrow for it to be a CFG.

- d)

This is a CFG. It has one non-terminal symbol on the left and one terminal followed by a non-terminal symbol on the right. Since the non-terminal symbol is the same on both sides of the arrow this represents recursiveness.

- e)

This is a CFG. The non-terminal A can derive itself or the non-terminal B or C.

- f)

This is a CFG. The non-terminal B can derive the terminal a. As it only has the one terminal symbol on the right, it is also in Chomsky normal form.

## 1.2

## 2

## 3

## 4

### 4.1

- a)

#### 4.1.1

Sentence 1: The old man the boat.

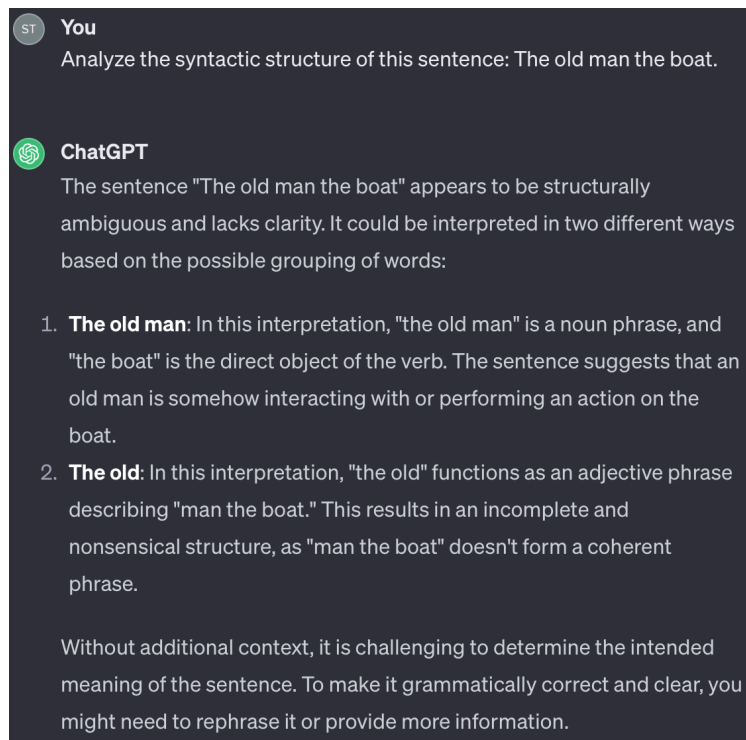


Figure 1: sentence 1

Sentence 1 is clearly wrong. The only way to interpret this sentence is:

$[the\ old]_{subject} [man]_{verb} [the\ boat]_{object}$

It is understandable that GPT got this wrong because the verb 'to man' isn't commonly used, and using 'the old' as a nominal phrase is also unexpected.

#### 4.1.2

Sentence 2: "The weary men manned the old boat on the tumultuous sea."

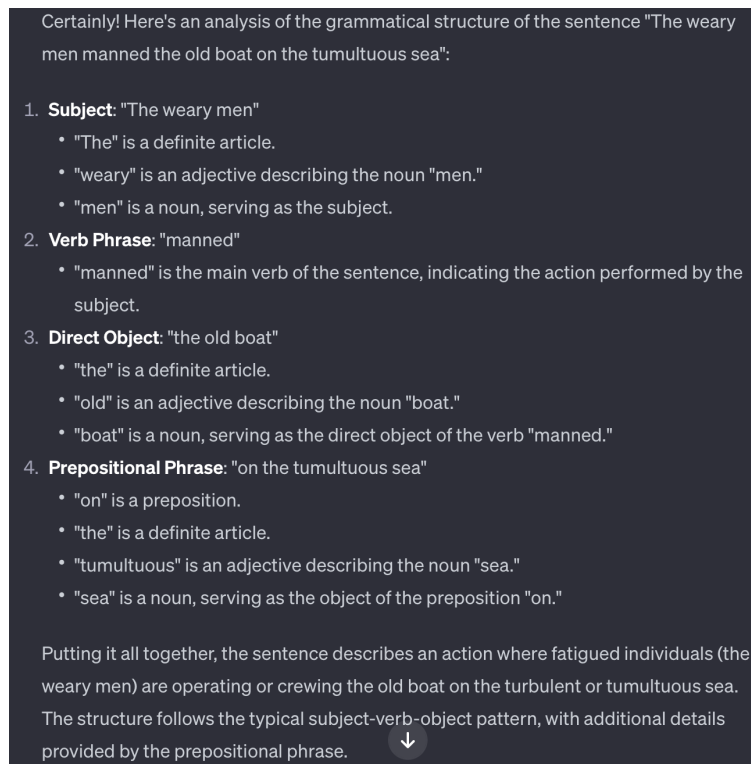


Figure 2: sentence 2

Sentence 2 was parsed perfectly.

#### 4.1.3

Sentence 3: "The weary did man their boat on the tumultuous sea."

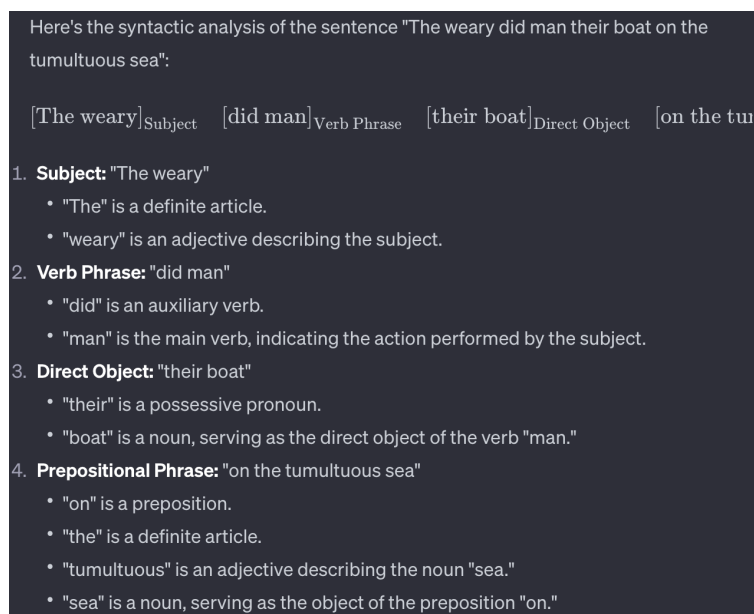


Figure 3: sentence 3

Sentence 3 was parsed perfectly. The only little mistake is that they say 'weary' is an adjective, although

in this context it is actually a noun. But you could argue that it is an adjective to the implicit noun (people, men etc)

#### 4.1.4

Sentence 4: "That we may fail is that which scares us most."

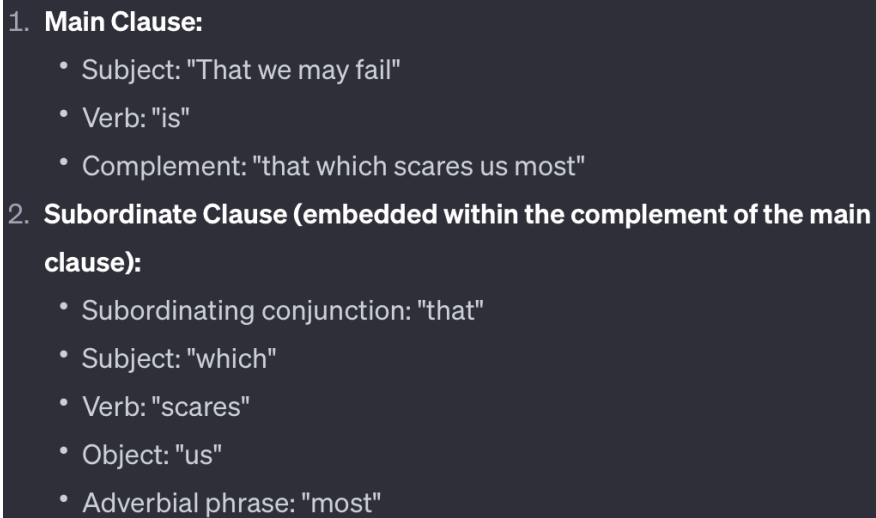
- 
1. **Main Clause:**
    - Subject: "That we may fail"
    - Verb: "is"
    - Complement: "that which scares us most"
  2. **Subordinate Clause (embedded within the complement of the main clause):**
    - Subordinating conjunction: "that"
    - Subject: "which"
    - Verb: "scares"
    - Object: "us"
    - Adverbial phrase: "most"

Figure 4: sentence 4

Sentence 4 was parsed incorrectly. In English, for emphasis, one may begin the utterance with the clausal complement ('that we may fail') - this does not make it the subject. Interestingly, the same sentence in the other order (sentence 5) is correctly interpreted).

#### 4.1.5

Sentence 5: "That which scares us most is that we may fail."

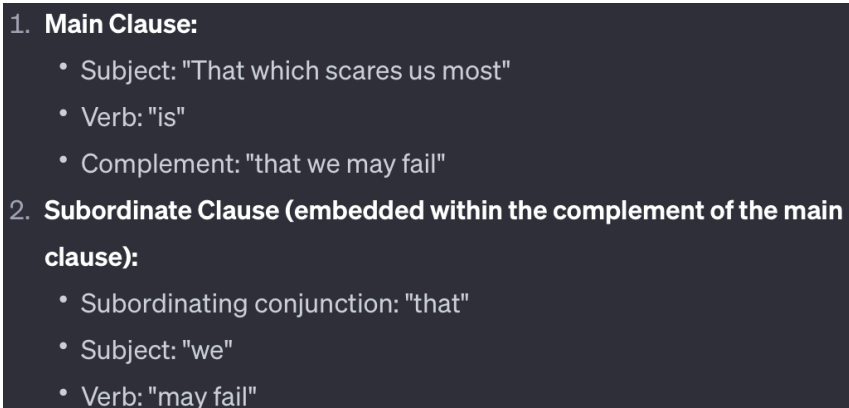
- 
1. **Main Clause:**
    - Subject: "That which scares us most"
    - Verb: "is"
    - Complement: "that we may fail"
  2. **Subordinate Clause (embedded within the complement of the main clause):**
    - Subordinating conjunction: "that"
    - Subject: "we"
    - Verb: "may fail"

Figure 5: sentence 5

Perfect.

#### 4.1.6

Sentence 6: "Whether she likes it is what we're worried about."

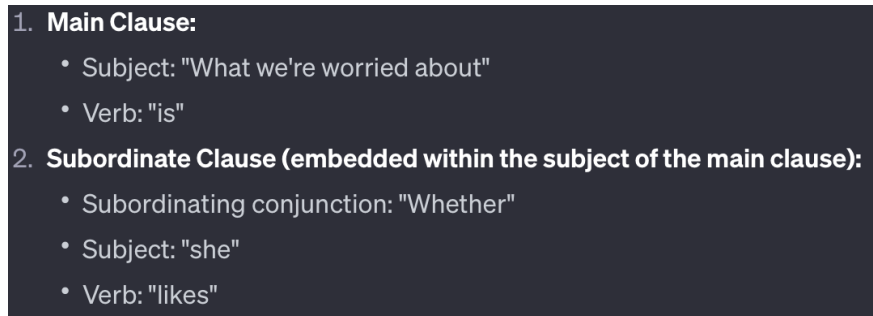
- 
1. **Main Clause:**
    - Subject: "What we're worried about"
    - Verb: "is"
  2. **Subordinate Clause (embedded within the subject of the main clause):**
    - Subordinating conjunction: "Whether"
    - Subject: "she"
    - Verb: "likes"

Figure 6: sentence 6

Incomplete but good job GPT. Interestingly, they weren't thrown off this time with the sentence-initial compliment, probably because 'whether' typically introduces a clausal compliment.

#### 4.1.7

Sentence 7: "Thinking I'd already missed the train, I quickly dropped the pace and leisurely meandered along the quaint streets of the old town."

##### **Adverbial Phrase Modifying the Verb "Thinking":**

- Subordinate Clause:
  - Subordinating Conjunction: "Thinking"
  - Subject: Implicit ("I")
  - Predicate: "I'd already missed the train"
    - Auxiliary Verb: "I'd" (contracted form of "I had")
    - Adverbial Phrase: "already"
    - Verb: "missed"
    - Direct Object: "the train"

```
[ S [ NP I ] [ VP [ AdvP Thinking [ S [ NP I ] [ VP [ Aux I'd ] [ AdvP already ] [ VP missed [
NP the train ] ] ] ] ] [ , ] [ NP I ] [ AdvP quickly ] [ VP dropped [ NP the pace ] ] [ Conj and ]
[ AdvP leisurely ] [ VP meandered [ PP along [ NP the streets [ PP of [ NP the town ] ] ] ] ]
[ . ] ]
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Figure 7: sentence 7

GPT did a good job with this sentence. I added a screenshot of just a part of the detailed description, where it even describes the implicit subject "I" in the adverbial phrase "Thinking..." I also prompted for a parsing in bracket notation and it seems quite good.

#### 4.1.8

Sentence 8: "She said she thought she knew his intent but she assumed he knew too."

subordinate clause introduced by the verb "knew." The second main clause contains a verb ("assumed") and a subordinate clause introduced by the conjunction "that," where the verb is "knew."

Figure 8: sentence 8

GPT parsed this sentence perfectly, but then in it's summary it says "subordinate clause introduced by the conjunction 'that'" - but this isn't in the sentence I gave - here we can see that it so expects something it just assumes it's there.

#### 4.1.9

Sentence 8: "Wenn hinter Fliegen Fliegen fliegen, fliegen Fliegen Fliegen nach."

- **Main Clause:** "Wenn Fliegen Fliegen fliegen, fliegen Fliegen Fliegen nach."
- Subordinate Clause (conditional): "Wenn Fliegen Fliegen fliegen"
  - Subordinate Clause (relative): "hinter Fliegen"
    - Preposition: "hinter" (behind)
    - Noun: "Fliegen" (flies)
  - Verb: "fliegen" (fly)
- Main Clause: "fliegen Fliegen Fliegen nach."
  - Verb: "fliegen" (fly)
  - Subject: "Fliegen Fliegen" (flies fly)
  - Prepositional Phrase: "nach" (after)

Figure 9: sentence 9

GPT knows this is a play on words (and must've read about it many times on the internet) and yet fails miserably to identify proper subjects and objects.

#### 4.1 b)

When asked to draw syntactic tree graphs, GPT first draws a simplified graph with some of the constituents missing. When prompted to draw a detailed tree, the provide code that looks like this:

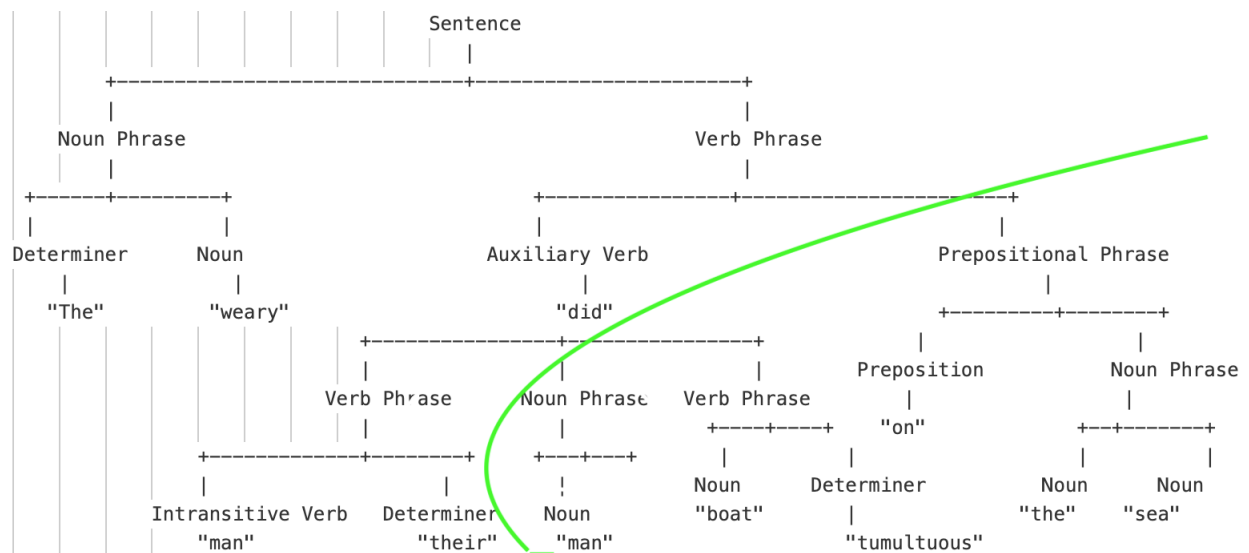


Figure 10: GPT tree sentence 3

This is interesting because GPT did quite a good job, and then failed miserably (like really random...) Everything is fine except the bottom right corner (marked with green line), where GPT starts making stuff up, like the Verb Phrase consisting of 'boat tumultuous'!

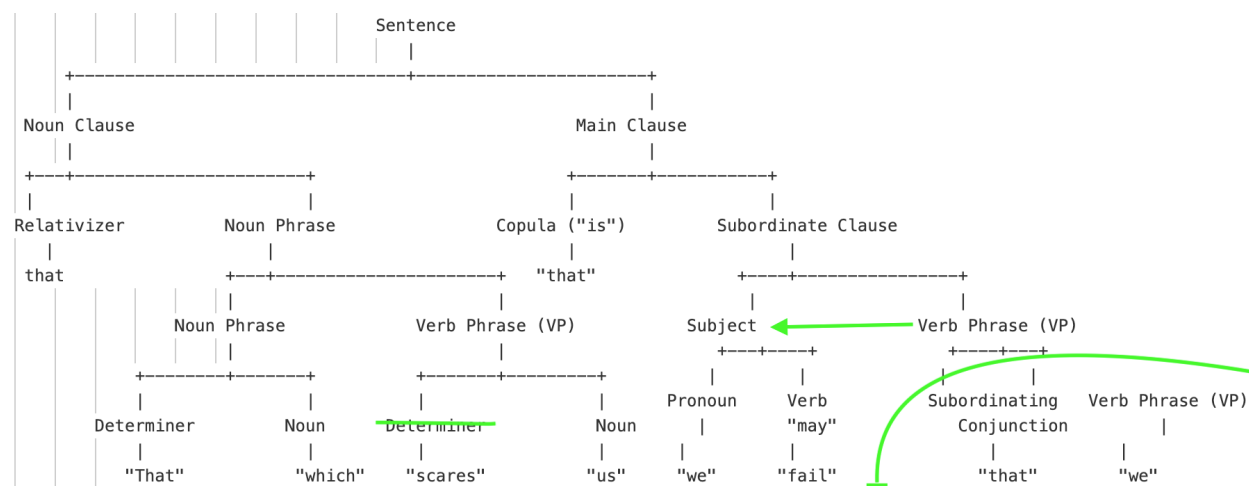


Figure 11: GPT tree sentence 5

Again GPT does really well except for the bottom right corner (what is it with that, like a grey zone for GPT, it knows something must come there but doesn't know what...) In this case it should've just been left blank, it didn't need another branch there. And the "subject" branch should've read "verb phrase".

## 4.2

### 4.2.1

Sentence 1: rewrite the following sentence in reported speech. 'I'm now looking to somehow find a somewhat more fitting replacement to tackle the tedious task at hand.'

He mentioned that he was currently seeking to somehow find a somewhat more suitable replacement to address the tedious task at hand.

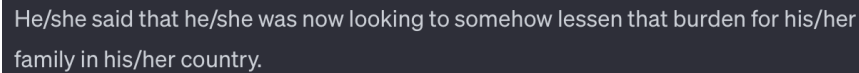
Figure 12: sentence 1



GPT correctly wrote the sentence in reported speech, and for some reason chose a masculine third person. They also replaced "fitting" with a synonym, "suitable", without me asking it to do that.

#### 4.2.2

Sentence 2: rewrite the following sentence in reported speech. 'I'm now looking to somehow lessen this burden for my family in this country of mine'

A dark-themed screenshot showing the output of a language model. The text reads: "He/she said that he/she was now looking to somehow lessen that burden for his/her family in his/her country."

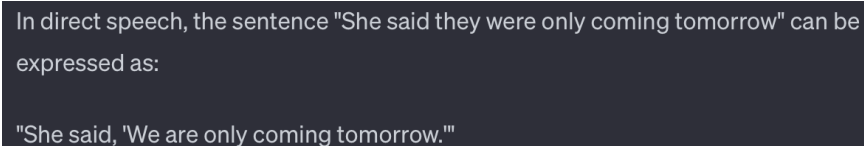
He/she said that he/she was now looking to somehow lessen that burden for his/her family in his/her country.

Figure 13: sentence 2

Again a grammatically correct sentence, this time both genders are given as options. I like that it correctly changed the deictic expressions (this to that) for reported speech.

#### 4.2.3

Sentence 3: now rewrite this sentence in direct speech: "She said they were only coming tomorrow."

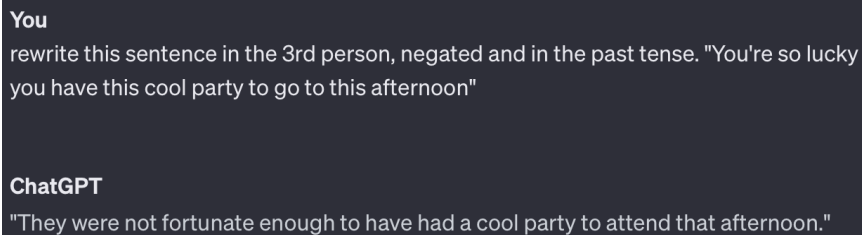
A dark-themed screenshot showing the output of a language model. The text reads: "In direct speech, the sentence 'She said they were only coming tomorrow' can be expressed as: 'She said, 'We are only coming tomorrow.''"

In direct speech, the sentence "She said they were only coming tomorrow" can be expressed as:  
"She said, "We are only coming tomorrow."

Figure 14: sentence 3

Great job, GPT! They even got the tense change right from "she said they were" to "we are".

#### 4.2.4

A dark-themed screenshot showing a conversation between a user and ChatGPT. The user asks to rewrite a sentence in the 3rd person, negated and in the past tense. ChatGPT provides the rewritten sentence.

**You**  
rewrite this sentence in the 3rd person, negated and in the past tense. "You're so lucky you have this cool party to go to this afternoon"

**ChatGPT**  
"They were not fortunate enough to have had a cool party to attend that afternoon."

Figure 15: sentence 4

Not bad! I was expecting 'he' or 'she' but 'they' is perfectly fine even for singular 3rd person in English.

## 4.2.5

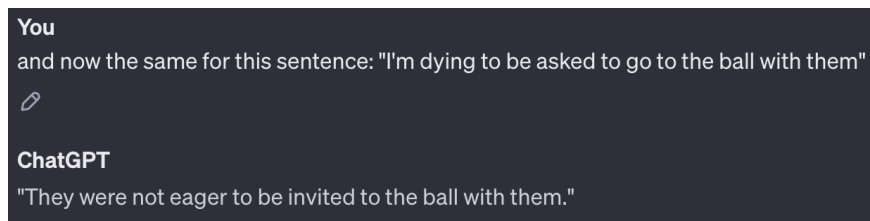


Figure 16: sentence 5

Perfect. I like how "i'm dying to" was changed to "they were not eager to", as negating "dying to" would sound odd!

## 4.2.6

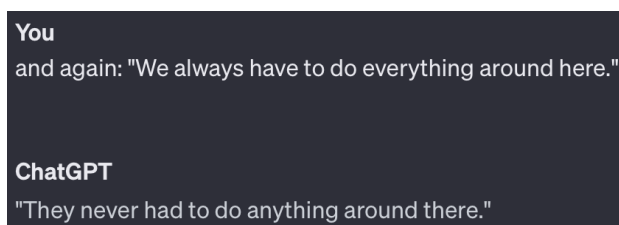


Figure 17: sentence 6

This one takes the cake! The deixis and the indefinite pronouns were correctly converted.

## 4.2.7

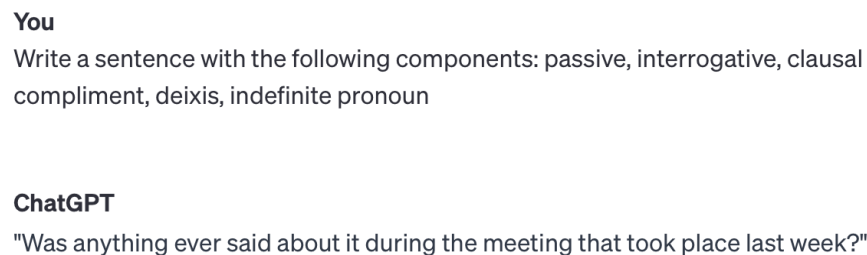


Figure 18: sentence 7

Impressive.

### 4.2.8

**You**

now add an indirect object and an expletive

**ChatGPT**

"Was anything ever said to them about it during the meeting that took place last week?"

Figure 19: sentence 8

Nice addition of indirect object - the expletive is missing though.

### 4.2.9

**You**

Write a sentence with the following components: passive, interrogative, clausal compliment, deixis, indefinite pronoun, indirect object. start the sentence with "she pondered whether.."

**ChatGPT**

"She pondered whether anything had been explained to him about it during the presentation that took place last month."

Figure 20: sentence 9

Couldn't have done it better :)

## 4.3

### 4.3.1

ST

**You**

Is the following sentence grammatically correct? "Your making me boring with you're long stories."



ST

**ChatGPT**

No, the given sentence has a few grammatical errors. Here's a corrected version:

"You're making me bored with your long stories."

Changes made:

1. "Your" is corrected to "You're," which is a contraction of "you are."
2. "Making" is used instead of "making," as it's the correct form in this context.
3. "Boring" is changed to "bored" to make the sentence grammatically correct.
4. "You're" is corrected to "your" to indicate possession in "your long stories."

Figure 21: sentence 1

Perfect. It picked up all 3 errors. It somehow added a superfluous point (making instead of making) in it's summary.

### 4.3.2

**You**

Is the following sentence grammatically correct? "We're playing tennis every Saturday in the tennis court, comes rain or sunshine."

**ChatGPT**

The sentence has a slight grammatical issue. Here's a corrected version:

"We play tennis every Saturday on the tennis court, come rain or shine."

Changes made:

1. Changed "We're playing" to "We play" for conciseness and clarity.
2. Replaced "in" with "on" to correctly indicate the location on the tennis court.
3. Used "come rain or shine" instead of "comes rain or sunshine" for idiomatic correctness.

Figure 22: sentence 2

Great. I like that it corrected the tense due to the repetitiveness of the action (every Saturday). It also picked up on the wrong preposition used with a tennis court and most interestingly, the subjunctive 'come' instead of 'comes', as this is a set expression in English.

### 4.3.3

**You**

Is the following sentence grammatically correct? "He might of said it to Paul and I, but I think he wants I make it better next time."

**ChatGPT**

The sentence contains a common grammatical mistake. The correct version is:

"He might have said it to Paul and me, but I think he wants me to make it better next time."

Changes made:

1. "might of" is corrected to "might have."
2. "I" is changed to "me" after "Paul and" as it functions as the object of the preposition "to."
3. "I" is changed to "me" after "wants" to correctly function as the object of the verb.

Figure 23: sentence 3

Quite impressive, perfectly done again.

## 4.4