

Python 3 Artificial Intelligence – Individual Task 1

Course	ENGR 13300	Semester	Fall 2025
Assignment Name	HW1 PY3 Ind	Section	LC5
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PART 2: What is ChatGPT and how can you use it to learn to code?

Read the articles linked below (PART 1) and answer the following questions. Answers should be in paragraph format and fully answer all parts of each question. You may use other sources to inform your answers as long as you provide citations.

[Article 1](#)

[Article 2](#)

[Article 3](#)

1. In your own words, what is ChatGPT and how does it generate responses to given prompts?

ChatGPT is a LLM that basically generates responses by predicting the most probable sequence of words following the initial prompt.

2. What is a “language model”? How is it different from a search engine?

A language model is an AI system trained on large quantities of text to understand, generate, and manipulate human language, while a search engine is just a tool to find and retrieve specific information from the web.

3. What types of tasks does ChatGPT perform well at? What are some tasks that it struggles with?

ChatGPT excels at tasks regarding language generation and understanding, which makes it great at things like writing, summarizing, and brainstorming, as well as data analysis and interpretation, since all these things follow patterns. It struggles with things that require more adaptability and real-world experience, so things that require extended reasoning, emotional intelligence, and common sense.

4. What are **three ways** ChatGPT can help you learn python?

It can give you personalized lessons for concepts, functions, or libraries, that you are struggling with.

5. What are **two specific risks** of relying too heavily on ChatGPT for writing python code?

It can provide inefficient or logically flawed code, and it can cause you, the developer, to lose critical thinking skills required for problem solving that hand-coding can develop. It also means that beginners to coding will not understand the fundamentals if they have ChatGPT completely build out a solution.

6. Give an example of a situation where using ChatGPT would be **helpful** to learning python and one example of a situation where ChatGPT would be **harmful** to learning python.

It can be useful as an interactive debugger and explainer, but it can be harmful if it starts using libraries to complete a task in a more advanced way when you don't even know what that library is / how to use it yet.

PART 3: *Debugging Python Code: Human vs AI*

An engineer is working on creating a script that can calculate the maximum bending stress on a beam under a point load at the center. The formulas the engineer is working with to calculate the maximum bending stress are listed below. The following python script does not work as intended by the engineer.

Stress Formulas:

- Bending Moment $M = \frac{F * L}{4}$
- Moment of Inertia $I = \frac{b * h^3}{12}$
- Distance to Outer Fiber $c = \frac{h}{2}$
- Stress Formula $\sigma = \frac{M * c}{I}$

Variables:

- F = applied force (N)
- L = span length (mm)
- b = beam width (mm)
- h = beam height (mm)

Broken Python Code:

```
1
2 def beam_stress(F, L, b, h):
3     # Force must be positive
4     if F <= 0:
5         print("Force must be positive")
6         return 0
7     # Calculate bending moment
8     M = F * (L / 4)
9     # Moment of inertia
10    I = b * (h ** 3) / 12
11    # Distance to outer fiber
12    c = h / 2
13    # Stress formula
14    I = 0.075
15    stress = (M * c) / I
16    # Return Stress value
17    return stress
18
19 def main():
20     # Inputs
21     Force = input("Input applied force (N): ")
22     Length = float(input("Input span length (mm): "))
23     Width = float(input("Input beam width (mm): "))
24     Height = float(input("Input beam height (mm): "))
25     # Check user inputs
26     if Force > 0 or Length > 0 or Width > 0 or Height > 0:
27         print("Inputs are valid")
28     else:
29         print("Invalid input values")
30     # Calculate Stress Value
31     stress_value = beam_stress(Force, Length, Width, Height)
32     # Convert Stress Value to Pa
33     stress_value = stress_value / 1000 * 2
34     # Print Output
35     print("Beam stress:", stress_value, "Pa")
36
37 if __name__ == "__main__":
38     main()
```

1. List three possible debugging steps you could take to determine what parts of the code are not functioning properly. Be descriptive in how you would perform each of these steps.

First, I would run the code to see if there are errors being outputted and if there are, then I would check out the line where the error is and repeat the process until there are no more runtime errors. Next, I would put print statements after the variables are calculated to see if that calculations are giving the outputs I intended. Lastly, I would check the logic in the if statement to see if it makes sense to give me the intended output.

2. Identify four bugs (incorrect statements) in the code presented above based on the debugging steps you listed in question 1. For each bug, list the line number, what about the statement is incorrect, and one possible correction. This does not need to be in a paragraph format; you may use bullets or a list.

1. I is given as a formula on line 10 but then hardcoded on line 14, so it does not change based on the other variables.
2. On line 21, the input is not casted to an float
3. On line 26, the if statement is using OR not AND, so if one value is positive but the rest are not, the program thinks it has valid inputs, which it doesn't
4. The conversion to Pascals is wrong on line 33, it should multiply the stress_value by 1,000,000

3. How could you have used ChatGPT to help you debug this code or your own code in the future? What type of prompts would be most useful?

I would give it the code and first tell it what I am trying to achieve with the code. Then I would ask where the logical and syntaxial flaws exist in my code.

4. How would asking ChatGPT for help here potentially hurt your understanding? What steps could you take to prevent these misunderstandings from happening?

I could just ask it to fix my code for me, in which case I would not learn what mistakes I initially made, harming my understanding of how coding in python works.

Using tools like ChatGPT is allowed **only if explicitly permitted**. For this assignment, you are expected to complete the coding task in Part 3 without AI assistance. In future assignments, you

may use tools like ChatGPT **only to supplement your understanding**, not to complete the work for you.