Next-gen-programming

First Pitch

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Proposed plan

What we have done

Model decision

Lineup:

- GPT-2
- GPT-Neo
- T5
- GPT-J
- CodeGen
- CodeT5
- LLAMA

Simplicity

Decided to start simple

If we have time we can implement a more difficult dataset

Dataset

Started creation of a simpler dataset

No dataset we could find had what we wanted

Tested models

GPT-2

- Good understanding of human text
- Bad at translating into code

```
Question: Convert this word problem into Python code to calcula
Generated Code: Convert this word problem into Python code to c

>>> def subtract_7(x): ... return x - 7 ... >>> print(subtract_

The answer is 7.

The problem is that the answer is not a number. It is a string.

The solution is to use a string literal.

>>> print(subtract_7(10
```

CodeGen

- Okay understanding of human text
- Good at translating into code

```
# Solution:

# def subtract_seven(n):
#     return n - 7

# print(subtract_seven(10))
```

CodeT5

- Good understanding of human text
- Good at writing code
- Bad at translating from human to code

```
"What is the sum of 3 and 5?",
"",
"",
"",
"",
"What is the sum of 3 and 5?",
"",
".",""",
```

Simplicity & dataset

Our decisions

Start simple in order to use our time efficiently

Create our own dataset to have them more inline with our goals


```
{"question": "What is the sum of 3 and 5?", "expected_code": "def solve(): return 3 + 5"}
{"question": "What is the result of subtracting 7 from 10?", "expected_code": "def solve(): return 10 - 7"}
{"question": "What is the product of 4 and 6?", "expected_code": "def solve(): return 4 * 6"}
{"question": "What is the result of dividing 12 by 3?", "expected_code": "def solve(): return 12 / 3"}
{"question": "What is the sum of 8 and 15?", "expected_code": "def solve(): return 8 + 15"}
{"question": "What is the result of subtracting 20 from 50?", "expected_code": "def solve(): return 50 - 20"}
{"question": "What is the product of 7 and 3?", "expected_code": "def solve(): return 7 * 3"}
{"question": "What is the result of dividing 100 by 25?", "expected_code": "def solve(): return 100 / 25"}
{"question": "What is the sum of 11 and 9?", "expected_code": "def solve(): return 11 + 9"}
{"question": "What is the result of subtracting 5 from 13?", "expected_code": "def solve(): return 13 - 5"}
{"question": "What is the product of 2 and 8?", "expected_code": "def solve(): return 2 * 8"}
{"question": "What is the result of dividing 16 by 4?", "expected_code": "def solve(): return 16 / 4"}
{"question": "What is the sum of 12 and 8?", "expected_code": "def solve(): return 12 + 8"}
{"question": "What is the result of subtracting 4 from 15?", "expected_code": "def solve(): return 15 - 4"}
{"question": "What is the product of 9 and 7?", "expected_code": "def solve(): return 9 * 7"}
{"question": "What is the result of dividing 81 by 9?", "expected_code": "def solve(): return 81 / 9"}
{"question": "What is 3 raised to the power of 4?", "expected_code": "def solve(): return 3 ** 4"}
{"question": "What is the square root of 64?", "expected_code": "import math\ndef solve(): return math.sqrt(64)"}
{"question": "What is the sum of 14 and 19?", "expected_code": "def solve(): return 14 + 19"}
{"question": "What is the result of subtracting 25 from 50?", "expected_code": "def solve(): return 50 - 25"}
{"question": "What is the product of 6 and 11?", "expected_code": "def solve(): return 6 * 11"}
{"question": "What is the result of dividing 144 by 12?", "expected_code": "def solve(): return 144 / 12"}
{"question": "What is 2 raised to the power of 8?", "expected_code": "def solve(): return 2 ** 8"}
{"question": "What is the square root of 121?", "expected_code": "import math\ndef solve(): return math.sqrt(121)"}
{"question": "What is the sum of 7 and 13?", "expected_code": "def solve(): return 7 + 13"}
```

UI and Deployment

Website

- Input: math problem as a natural language prompt
- Generate button
- Output: Python code for solving the task

Frontend

- Develop using React.js
- Deploy with Vercel

Backend

- FastAPI
- Deploy using Render

Questions?