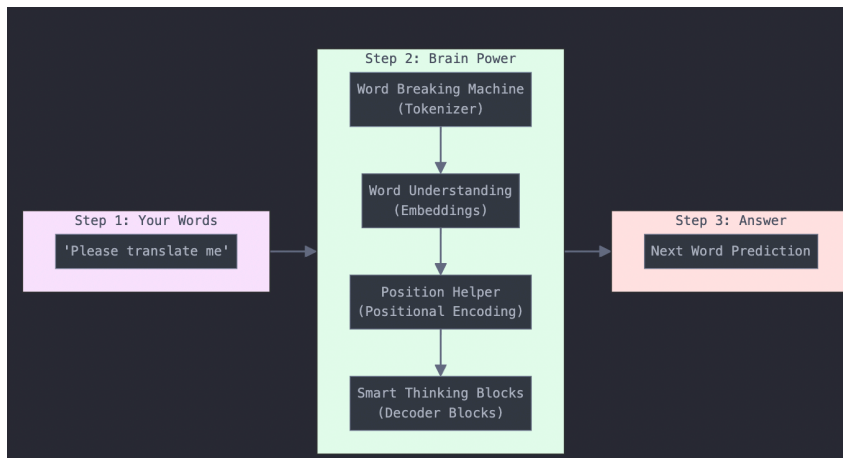


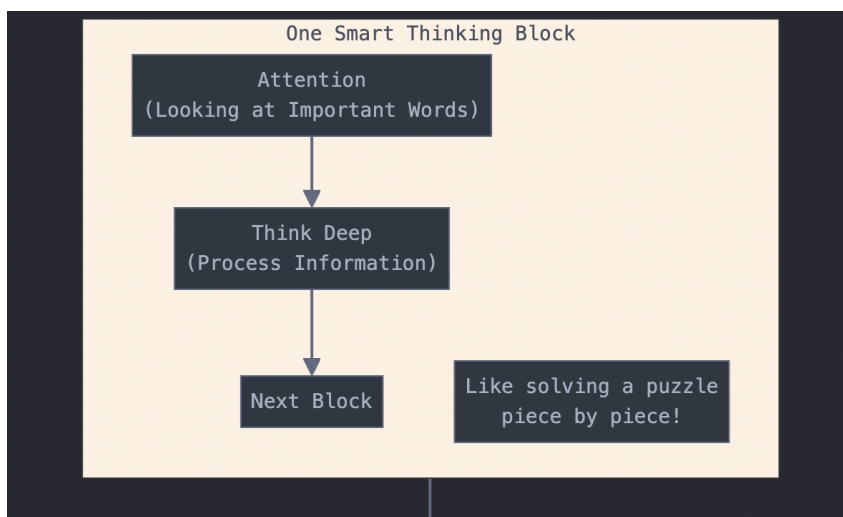
GPT

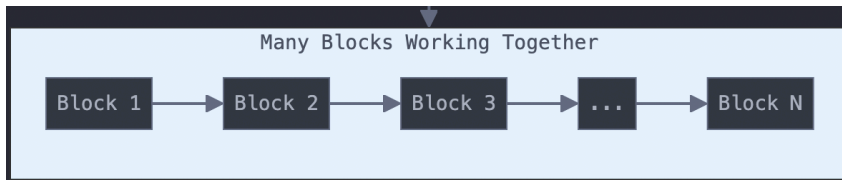
Friday, 17 January 2025

7:47 PM



- **Word Breaking (Tokenization)**
 - Think of it like breaking a big chocolate bar into smaller pieces
 - Each piece is called a "token"
 - Example: "Please translate me" → "Please" "trans" "late" "me"
- **Word Understanding (Embeddings)**
 - Like giving each word a special code that shows what it means
 - Similar words get similar codes
 - Just like how "happy" and "joyful" mean almost the same thing!
- **Remember the Order (Positional Encoding)**
 - Like numbering steps in a recipe
 - Helps remember which word comes first, second, third...
 - Very important for understanding the meaning!
- **Smart Thinking Blocks (Decoder Blocks)**
 - Think of these as different experts working together
 - Each block:
 - Looks at important words (Attention)
 - Thinks deeply about them (Feed Forward)
 - Passes information to the next expert
 - They work together like a team solving a puzzle
- **Final Answer (Output)**
 - After all the blocks think about it
 - GPT picks the best next word
 - Like finishing someone's sentence!





Decoder

1. **Think of a Decoder as a Super-Smart Reader**
 - It's like having a friend who's really good at reading and understanding stories
 - This friend helps you predict what comes next in the story
2. **Three Special Powers:**
 - **Look Back Power** (Self-Attention)
 - Like having a perfect memory of what you just read
 - Example: "The cat sat on..." (looks back) "...the mat!"
 - **Think Deep Power** (Feed Forward)
 - Like a student thinking carefully about what they read
 - Connects ideas together, just like solving a puzzle
 - **Remember Power** (Memory)
 - Like taking really good notes while reading
 - Uses these notes to understand the next part better
3. **Team Work**
 - Multiple decoders work together like study buddies
 - Each one makes the understanding a little better
 - First decoder: "I know the basic words!"
 - Second decoder: "I understand the sentences!"
 - Third decoder: "I get the whole story!"

Fun Examples to Remember:

1. **Restaurant Order Example:**
 - First decoder: Reads the menu items
 - Second decoder: Understands food combinations
 - Third decoder: Predicts what you might want for dessert!

Tokenization

1. **What is Tokenization?**
 - Converting text into numbers the AI can understand
 - Like translating English into "Computer Language"
 - You can try it yourself on OpenAI's tokenizer tool!
2. **Token Types:**
 - **Single-Token Words**
 - Most common words ("cat", "dog", "house")
 - Each gets one unique number
 - **Multi-Token Words**
 - Long words split into pieces
 - Example: "indivisible" → "ind" + "iv" + "isible"
 - Like breaking chocolate into smaller pieces
 - **Special Tokens**
 - Punctuation (., !, ?)
 - Numbers (123, 456)
 - Emojis and Unicode characters
 - Contractions (I'm, don't)
3. **Why This Matters:**
 - Helps AI understand language better
 - Makes processing more efficient
 - Handles new or unusual words
 - Captures meaning relationships
4. **Where to See It in Action:**
 - OpenAI's Tokenizer Tool
 - GPT Playground
 - When using ChatGPT (behind the scenes)

Vector to Result

- **Final Vector to Probabilities**
 - Take the final vector from the decoder
 - Multiply it with the embedding matrix
 - Get probability scores for all possible tokens
- **Word Selection Process**
 - Each token gets a probability score
 - Higher score = More likely to be the next word
 - System can either:
 - Pick the highest probability (deterministic)
 - Use temperature to add randomness
- **Temperature Effects**
 - Low temperature (0.1): Always picks most likely word
 - Medium temperature (0.7): Some variety but still sensible
 - High temperature (1.5): More creative/random choices
- **Simple Example:** Input: "The cat sat ___" Process:
 1. Get vector from decoder
 2. Multiply with embeddings
 3. Get probabilities:
 - "on": 85%
 - "in": 10%
 - "at": 3%
 4. Choose based on temperature setting
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