Making a Game with Chat-gpt3

# What is Chat -GPT3?

# Making a Game

## Generating the Game Idea and theme

To begin I asked GPT to give me a list of 10 possible game ideas. Here is what it generated.

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Of this list I chose #4 which is the whack-a-mole game. I then asked GPT to provide a list of possible names and color schemes for the game. Text

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After choosing name #3 and color scheme #2, I asked GPt to repeat them to me so I knew it remembered my choices.

Graphical user interface, text

Description automatically generated

## Programing the game

Now with a game idea, name, and color scheme chosen I began asking GPT to program the game. I decided to ask it to make a python program because of how little code is needed to make a simple game in python. To start I just asked GPT to make a python program that drew a screen of 600x400 pixels and colored it dark green. The full program is too long to paste here but I will share the output of that program when directly copied and pasted into VS Code.

A screenshot of a computer

Description automatically generated with medium confidence

Shape

Description automatically generated

Notably this code includes a check for the quit event from pygame which allows one to close a game window by clicking the X button in the top right. Many new game programmers forget that feature so I was impressed GPT added it without being explicitly told to. Next I asked GPT to make a class for me to represent my “Moles” in the game.

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Not only did GPT create the class.

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But it also showed an understanding of how the code works by providing an example of how the code could be implemented with our existing program

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But the point of this is to have GPT make the game entirely on its own, so I then asked GPT to spawn a 3x3 grid of these moles to represent the game area

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And from the output of this updated program, it worked but the moles were not spaced vertically

A picture containing background pattern

Description automatically generated

But I noticed that GPT initially hard coded the creating of the mole objects to an array in a way I did not likeText

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So I asked if it could rewrite that section of the program to be more modular and it did so!

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Not only did this make the code easier to change down the line, but it also fixed the vertical spacing bug from earlier

A picture containing text, pallette, vector graphics

Description automatically generated

To make the code even more readable, I asked it to make a color variable and use that to initialize the Moles instead of hardcoding.

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Text

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To begin adding functionality and to test how well it remembers specific parts of the code, I asked GPT to add a variable and method to the Mole classText

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A screenshot of a computer

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Again GPT provided a use case for the new method, but I was surprised by the commenting of this example.

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“If the mole is up, set it to down” The only place where I referenced that this variable displays if the mole is up or down is in the name “mole\_up”. GPT on its own was able to parse that name, recognize that it abstracted to an up and down state, and determine that false was the down state and true was the up state.

Now to add functionality to the game and test GPT’s knowledge of pygame events, I asked it to start listening for a click from the user and to call the new method on any mole the user clicks on

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At this point however I ran into an issue where no matter how long I waited before sending a request, I was given this error.

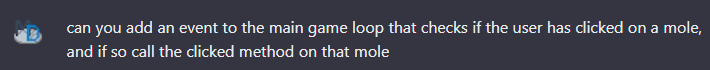
A picture containing text

Description automatically generated

Upon googling the issue I learned that it could be an issue with referencing previous answers from GPT, as each time GPT references a previous answer it counts as a request. It is possible that at the current state of GPT, programming with the AI is limited by the number of times you can iterate upon a program before exceeding this request limit. To test this I tried “resetting” the bot by asking it to tell me what the python program does and pasting the entire program it generated. Text

Description automatically generated

GPT successfully described the function of the program, I then asked it to add the click event functionality in a new way that made sense to the new context of the conversation



GPT was then able to edit the code I gave it the same way as it had been editing it’s own generated code before.

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Description automatically generated

I wanted to move the if statement for checking if the mouse was over a mole into its own method for readability purposes.

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I imagined this being a global method which is why I specified needing to pass the index into the function, but GPT made this a method in the Mole class

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I liked making it a class method, but the index being passed is now no longer needed, so I asked GPT to rewrite the method using the local p[osition of the Mole that calls it.

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This resulted in a much smaller method,

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and a much cleaner look where it is called

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And here is an image of the sprites after clicking the top row (Note that the clicked method now turns the circles red, this is due to the code I pasted when “resetting” the bot not having the click method and GPT generating a new click method on its own) A screenshot of a computer

Description automatically generated with low confidence

Now that clicking functionality is added, I just need to make it so the game “pops up” a mole sprite every so often and then if it is clicked, puts it down and adds score. I ask GPT to edit the draw method so that when the mole is up, it also draws a sprite. I also had it re add in the is\_mole\_up variable and redo the clicked method to how we had it before resetting.

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Description automatically generated

Impressively, GPT was able to make all 3 changes in one prompt instead of needing to split them into separate instructions

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I then asked GPT to load in a sprite I created and store it.

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Description automatically generated

A screenshot of a computer

Description automatically generated with medium confidence

And then I told it to use that sprite instead of drawing a white circle when the mole is up

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Text

Description automatically generated

As you can see though the sprites (which are 1024x1024) are being drawn too big

A picture containing graphical user interface

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So I ask again for GPT to draw them smaller

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Which it now adjusts to scale the sprite down to the same size as the circle behind the sprite

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A picture containing background pattern

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At this point I had to stop for the day. GPT is not capable of remembering or saving conversations so once again I had to remind it of the program we were working on. This time I gave it the entire program, but asked it to only show me the Mole class. I did this because GPT had a habit of trying to print out the entire program I gave it and that both took a long time to print out and sometimes caused a “network error” that broke the GPT thread I was working in  
Graphical user interface, text

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Graphical user interface, text

Description automatically generated

Now I began adding a method of keeping score to the game. I also updated my strategy for getting code back from GPT to be more concise by asking it to only show me the specific method I was changing

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Description automatically generatedI found it very helpful when possible to edit and ask for smaller portions of the overall code to again decrease the amount that GPT had to output in response. To further this idea I asked it to create the score variable and only show me code up to that new line. Graphical user interface, text, website

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Interestingly instead of giving an output exactly as I asked, GPT gave an arguably better response where it created the line of code to initialize a score variable and told me how I could put it in my code. This could cause problems going forward however in iterating upon the total program as GPT does not now have a version of the program with the score variable implicitly defined on a specific line. This along with the benefit of working on smaller sections of code at once led me to a more modular form of development from here on. Instead of copying and pasting the entire code GPT created into VS Code, I would copy and replace certain areas of the existing code to continue iterating on what was already there.

With this mindset, instead of asking it to add code to draw the current score into the game loop I instead specified for GPT to create that code in a method

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I then asked GPT to add this method into the game loop of our existing program, but I think at this point it had been so long since we referenced the overall program we were working with that GPT had forgotten it. Graphical user interface, text, application

Description automatically generated To fix this I asked it instead to add the draw score method to “this while loop” and pasted in the specific loop I wanted the method placed into. Any error can also cause one to have to reset the GPT thread, so as part of my question I also included the method we had just created so GPT knew what the draw score method was Text

Description automatically generated Text

Description automatically generated Text

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At this point I tried to play the game, but the clicked method was throwing an error because it did not specify that score was a global variable before trying to update it. I asked GPT to fix this by just giving it the method and the error. Text

Description automatically generated

GPT recognized the two ways that the method could be fixed and provided both solutions, as well as explaining why the error was happening

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By pasting in the version of the method with the global variable fix, I was able to get the game working with a score counter

A picture containing icon

Description automatically generated

The game is now nearly finished, all that is left is to make the moles pop up and down randomly. I started by using GPT to get an appropriate range for the time up and time down

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One issue with GPT in general is its tendency to give overly verbose answers. I then added these ranges to the Mole class

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Note that the min and max values are backwards in this code. This is a good example of how GPT does not always make perfect code and it is important to proof read any answer it gives you. Lets see if it can fix its mistake.

Graphical user interface, text

Description automatically generatedI realized at this point I will also need to store the actual time value the mole should be up/down, so I asked GPT to generate those for me

Text

Description automatically generated A screenshot of a computer

Description automatically generated with medium confidence

Now to regenerate random numbers each time the mole changes up/down I asked GPT to make a toggle Up method. Text

Description automatically generated Text

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I will add this into the clicked method instead of setting is mole up directly.

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Description automatically generated

We are now one step from finishing the game, all that is needed is an update method that calls toggle up after the needed amount of time has passed on the mole Text

Description automatically generated Text

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Of note here is that I did not specify which time variable to compare to or that it should switch for both the up and down states with separate timing variables. GPT determined it needed to do that based on the variables in the mole class alone. Now this update class needs to be called in the actual game loop

Graphical user interface, text, email, website

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Description automatically generated

And now the game should be playable. GPT has made the code to draw a screen, color it dark green, create a 3x3 grid for moles to pop up, randomly pop the moles up and down on different time intervals, handle clicking on a mole when it is up and increment a score value, and close the game when the player is done. Additional changes should be possible to do such as adding music or a main menu. I am choosing to stop here though to show that a fully functional program can be made without actually hand writing a single line of code using Chat GPT3.

## Generating Game Art

To generate the art for the game I used OpenAI’s other product DALL\*E which is able to generate images. To fit the retro theme I decided to make the art for the mole itself pixel art. Here is the prompt

Graphical user interface

Description automatically generated with low confidence

And here are the initial 4 results

A picture containing text, screenshot

Description automatically generated

Of these I liked the far left the most, but I wanted to have more options. So I chose that image and asked Dall\*E to make variations of it

A picture containing text, toy, clipart

Description automatically generated

In the end I still prefer the initial image, and with a solid white background it will be easy to make into a sprite for my game. I decided to give the image a transparent background using DALL\*E’s image editing software before downloading so that Only Open-AI software would be used in the course of making this game. That did however mean that I had to manually erase the background which left some imperfections on the image, but they can not be seen at the scale the image will be used

Chart

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# Results and Observations

Chat GPT showed a much better understanding of the code it generated than I expected. As stated earlier with the comment for the clicked method, It is able to parse the intent of a variable and method from their name and usage. Additionally, when feeding prompts to GPT it was able to understand abstractions in the code such as referring the Moles directly and understanding what objects that name referred to. Finally, GPT was able to improve portions of its code when asked to such as with the initialization of the moles. This means it is capable of finding multiple different solutions to the same problem. I did find it very interesting that the initial attempt to initialize the Moles statically had a bug in the y-spacing, but upon editing that code to fit my request GPT fixed the bug. I did not ask it to change how the y spacing worked but for whatever reason it changed how the moles were placed when it went from static to dynamic.

It should be noted that I had to periodically reset the bot by clearing the thread and pasting in the existing code to “remind” GPT of what we were working on. I sometimes needed to tell it to reinclude things already done like actually generating the screen and importing pygame.

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Also, there is a limit to how long the answers it gives are. So at a certain point I had to start asking for the code in pieces like this.

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I very specifically had to tell it to not include any other code

# What else can Chat-gpt3 do?

Chat GPT is a very flexible chatbot that can do a lot more than just code. One of the most simple but useful things it can do is provide lists of suggestions on various topics. This can be used very successfully for brainstorming as someone can almost instantly get a list of relevant items to compare. GPT can also write music lyrics, poems, and even essays. Right now, these are somewhat unpolished but they are still indistinguishable from that of a human. This brings up an important question of if any piece of work can be AI generated, how does the way homework is assigned and graded change?

# Implications for school and work