

Approach:

To make an email assistant that can complete email like described in the assignment's goal description, I used the last example from the lecture's Jupiter Notebook but added the user model to the script. In this implementation the user model and task model are updated based on the email dataset with 15 emails to get more and more accurate results. The models learn about the different parameters that has been set in the user model and task model to make individualized emails depending on who the recipient is. ChatGPT was used to make incorporate the user model to the task.

User model:

```
user_model = {  
    "Sender": "unknown",  
    "Sender's job": "unknown",  
    "Sender's response time": "unknown",  
}
```

```
def infer_user_model(_email, _user_model):  
    prompts = [  
        {  
            "role": "system", # This is to set the role and instructions for LLM  
            "content": "You are an agent designed to auto complete an email.\n"  
                        "You will be given an \"email\" and your previous understanding about the \"sender\".\n"  
        },  
        {  
            "role": "user", # This is the input prompt  
            "content": "### Email ###\n"  
                        f"_{_email}\n"  
                        "### Sender ###\n"  
                        f"_{_user_model}\n"  
                        "Update the listed information based on the email.\n"  
                        "Show only the result in the following format:\n"  
                        "{\n"  
                        "    \"Sender\": \"\", \n"  
                        "    \"Sender's job\": \"\", \n"  
                        "    \"Sender's response time\": \"\"\n"  
                        "}"  
        }  
    ]  
  
    output = generate_response(prompts)  
  
    # Conver to JSON  
    start = output.find('{')  
    end = output.find('}') + 1  
    json_output = json.loads(output[start:end])  
  
    return json_output
```

Figure 1, the framework for the user model

Task model:

```
task_model = [
    {
        "Recipient": "unknown",
        "Recipient's relationship with the sender": "unknown",
        "Goal of the email": "unknown",
        "Tone of the email": "unknown",
        "Grammatical errors or typos": "unknown",
        "Emojis in the email": "unknown",
        # ...
    }
]

def infer_task_model(_email, _task_model):
    prompts = [
        {
            "role": "system", # This is to set the role and instructions for LLM
            "content": "You are an agent designed to auto complete an email.\n"
                       "You will be given an \"email\" and previous information about the \"task\".\n"
        },
        {
            "role": "user", # This is the input prompt
            "content": "### Email ###\n"
                       f"_{email}\n"
                       "### Task information ###\n"
                       f"_{task_model}\n"
                       "Update the listed information based on the email.\n"
                       "Show only the result in the following format:\n"
                       "{\n"
                       "  \"Recipient\": \"\", \n"
                       "  \"Recipient's relationship with the sender\": \"\", \n"
                       "  \"Sender's goal with the recipient\": \"\", \n"
                       "  \"Sender's tone for the recipient\": \"\", \n"
                       "  \"Sender's amount of mistakes in writing\": \"\", \n"
                       "  \"Sender's amount of emojis in writing\": \"\"\n"
                       "}"
        }
    ]

    output = generate_response(prompts)

    # Conver to JSON
    start = output.find('{')
    end = output.find('}') + 1
    json_output = json.loads(output[start:end])

    return json_output
```

Figure 2, the framework for the task model

Evaluation results:

Topic: Trip to Spain

	Example email from the dataset	Email assistant email
Bob	<p>Hi Bob,</p> <p>I hope this message finds you well. I've been thinking about our upcoming project on user interface design, and I believe it's crucial we prioritize the testing phase with real-world end users. It's a proven strategy I've come across in my research. On another note, about the paperwork, can you please approve it by Friday? It would be really helpful.</p> <p>Thanks for your cooperation and support.</p> <p>Tom</p>	<p>Hi Bob,</p> <p>I hope this email finds you well. I'm writing to give you a quick update on the progress of our HCI project and to discuss a potential trip to Spain that aligns with our work timetable.</p> <p>We've made some significant headway in the research, and I believe it's a good time to synchronize our efforts on the project report. Please let me know if there are specific areas you'd like us to focus on or if you have any particular requests for the report, so we can ensure it meets our collaborative goals.</p> <p>On a different note, I've been thinking about planning a short trip to Spain, possibly to recharge and get inspired while winding down from our intensive research phase. If this sounds like something you'd be interested in, let's chat more about coordinating our schedules and see how we might include some project brainstorming sessions in a new setting!</p> <p>Looking forward to your input on both the report and the trip possibility.</p> <p>Best regards, Tom</p>
Emilia	<p>Hey Emilia,</p> <p>Hope things are going swimmingly on your end! Wanted to dive in to a quick chat about a new project I'm working on—it's all hush-hush for now but let's just say it involves making screens more human in a way even fish might approve. 🐟</p> <p>Anyway, I've been meaning to ask how's your underwater adventures been? Any cool sea tales to share? Maybe we can catch up over coffee soon—I'll bring the pics from my last diving trip if you bring yours!</p> <p>Miss our chats, Tom</p>	<p>Hey Emilia,</p> <p>I hope you're doing great and that life's been treating you kindly! 😊 I've had a whirlwind of busy days between diving and the intense focus of my HCI research—like finding that perfect buoyancy underwater! But I've got something exciting on my mind which might be the perfect getaway to balance out the grind!</p> <p>How about a trip to Spain? It's been ages since we've caught up, and I can't think of a better way than exploring the mesmerizing landscapes and diving into those vibrant cultures together! It would be awesome to disconnect from our daily routines and reconnect over some tapas and maybe a dive or two, if you're up for it. Just imagine the sun, sea, and lots of stories to share!</p> <p>Let me know what you think. We can coordinate the schedules, and perhaps even sneak in a little bit of 'research inspiration' along the way. 😊</p> <p>Looking forward to hearing from you soon!</p> <p>Best, Tom</p>
Mom	<p>Hey Mom,</p> <p>I hope you're doing well! I'm really excited to tell you that I've been deep into some interesting research at work. We're looking at how people interact with new technologies, and it's kinda fascinating to see how small changes can make big differences. I might have a chance to present our findings soon, which is pretty cool.</p> <p>On another note, I had an amazing time scuba diving this weekend. Saw some awesome fish and really enjoyed the tranquility underwater. It's such a refresher away from the screens.</p> <p>Looking forward to catching up soon. Give my love to Dad!</p> <p>Miss you lots, Tom</p>	<p>Hi Mom,</p> <p>I hope you're doing well! I just wanted to share some of my experiences from my trip to Spain. It was an amazing adventure, and I couldn't stop drawing parallels between the focus scuba diving demands and my work in HCI research. 😊</p> <p>The scenery was breathtaking, and I got a chance to dive into some beautiful waters. Despite being busy with research and preparing for potential presentations, the trip offered a wonderful break. I'll fill you in on more details once we catch up, but just thinking of it puts a smile on my face.</p> <p>I'd love to hear what you've been up to lately. Let's chat soon!</p> <p>Love, Tom 💙</p>

Figure 3, the result of the email assistant when the topic is “Trip to Spain”

Topic: Lunch

	Example email from the dataset	Email assistant email
Bob	<p>Hi Bob,</p> <p>I hope this message finds you well. I've been thinking about our upcoming project on user interface design, and I believe it's crucial we prioritize the testing phase with real-world end users. It's a proven strategy I've come across in my research. On another note, about the paperwork, can you please approve it by Friday? It would be really helpful.</p> <p>Thanks for your cooperation and support.</p> <p>Tom</p>	<p>Hey Bob,</p> <p>I hope you're doing well. I've been immersed in our HCI project, and there's some exciting progress I can't wait to share with you. I thought it might be a good idea to catch up over lunch. Are you available sometime this week?</p> <p>Additionally, if you have any specific requests or points you'd like included in the upcoming project report, please let me know. Your input is always valuable, and I want to ensure we're aligned in showcasing our work.</p> <p>Looking forward to hearing from you!</p> <p>Best, Tom</p> <p>P.S. Apologies for the delay in my response – it's been a busy time juggling research and diving adventures!</p>
Emilia	<p>Hey Emilia,</p> <p>Hope things are going swimmingly on your end! Wanted to dive in to a quick chat about a new project I'm working on—it's all hush-hush for now but let's just say it involves making screens more human in a way even fish might approve. 🐟</p> <p>Anyway, I've been meaning to ask how's your underwater adventures been? Any cool sea tales to share? Maybe we can catch up over coffee soon—I'll bring the pics from my last diving trip if you bring yours!</p> <p>Miss our chats, Tom</p>	<p>Hey Emilia! 😊</p> <p>I hope you've been doing well! It's been ages since we last caught up over a meal, and I was wondering if you'd be up for lunch sometime soon? With all the diving and HCI research I've been wrapped up in, it feels like I haven't paused to breathe (kind of like being underwater! 🐟).</p> <p>I'd love to hear more about what you've been up to, share some stories from both the liquid world and the tech one, and maybe even brainstorm our next adventure together. Let me know when you'd be free, and we can plan something that works.</p> <p>Looking forward to reconnecting!</p> <p>Take care, Tom</p> <p>P.S. Let me know if you have any specific place in mind!</p>
Mom	<p>Hey Mom,</p> <p>I hope you're doing well! I'm really excited to tell you that I've been deep into some interesting research at work. We're looking at how people interact with new technologies, and it's kinda fascinating to see how small changes can make big differences. I might have a chance to present our findings soon, which is pretty cool.</p> <p>On another note, I had an amazing time scuba diving this weekend. Saw some awesome fish and really enjoyed the tranquility underwater. It's such a refresher away from the screens.</p> <p>Looking forward to catching up soon. Give my love to Dad!</p> <p>Miss you lots, Tom</p>	<p>Hi Mom,</p> <p>I hope you're doing well! 😊 It's been a bit hectic here with all my research activities and a bit of diving adventures, so apologies for the delayed response. I wanted to touch base and see if we can arrange a time for lunch soon. I'm really looking forward to catching up and sharing all the exciting things happening at work—and on my dives!</p> <p>There's something really special about the way diving sharpens your focus and enhances your appreciation for the little details. It actually reminds me a lot of what I do in HCI research, where precision and attention to detail are key.</p> <p>Let me know when you're free for lunch. I promise I'll work around my schedule to prioritize our get-together. Miss you lots and can't wait to hear all your news too! 🐟</p> <p>Love, Tom</p>

Figure 4, the result of the email assistant when the topic is “Lunch”

User model:

User model:

```
{'Sender': 'Tom', "Sender's job": 'researcher in Human-Computer Interaction, enjoys scuba diving and is actively engaged in HCI research. He finds parallels between his research and scuba diving in terms of attention to detail.', "Sender's response time": 'delayed response due to being busy with ongoing research and diving activities, as well as the potential presentation of work.'}
```

Task model:

Task model:

```
[{'Recipient': 'unknown', "Recipient's relationship with the sender": 'unknown', 'Goal of the email': 'unknown', 'Tone of the email': 'unknown', 'Grammatical errors or typos': 'unknown', 'Emojis in the email': 'unknown'}, {'Recipient': 'Bob', "Recipient's relationship with the sender": 'colleague or collaborator', "Sender's goal with the recipient": 'update Bob on the latest progress of the HCI project and inquire about specific requests for the project report', "Sender's tone for the recipient": 'professional and friendly', "Sender's amount of mistakes in writing": '9 grammatical errors or typos', "Sender's amount of emojis in writing": '0'}, {'Recipient': 'Emilia', "Recipient's relationship with the sender": 'friend with shared interests', "Sender's goal with the recipient": 'reconnect, discuss ongoing research, organize a getaway, and share personal experiences', "Sender's tone for the recipient": 'friendly and informal', "Sender's amount of mistakes in writing": '7 grammatical errors or typos', "Sender's amount of emojis in writing": '2'}, {'Recipient': 'Mom', "Recipient's relationship with the sender": 'mother', "Sender's goal with the recipient": 'share personal experiences, reconnect, inform about their work', "Sender's tone for the recipient": 'affectionate and informal', "Sender's amount of mistakes in writing": '5 grammatical errors or typos', "Sender's amount of emojis in writing": '2'}]
```

As we can see from the Figure 3 and Figure 4, the email assistant works quite well. Depending on the recipient, it makes the formality and tone to match, the amount of emojis and remembers the relationship with and the past with the sender. For example, the last line for the recipient has different formality: “Bess”, “Take care”, and “Love”. Also, the sender uses emojis to Emilia and Mom but not to Bob like it is supposed to be. When the topic was “Lunch”, the sender tended to talk about scuba diving to Emilia and Mom because they are more informal but not to Bob who is a work-related person. The only thing the email assistant was not able to remake are the typos and grammatical errors the sender made in the dataset. I tried to prompt this in the task model, but it didn’t work.

The user model has gathered relevant information about the sender, therefore the user model somewhat aligns with the ground truth. However, there could be more specified information too. I tried to add parameters such as “cultural/regional information” and “to whom does sender tell personal information” but this resulted in email that were too similar to each other no matter who the recipient was.

Conclusions:

The value alignment problem was to use proper style for each recipient depending on the user model parameters, but at the same time the sender’s personality needs to be taken into consideration in relation to the discussed topic. I was able to solve most of the alignment problems, except the grammatical error and typo one.

It seems like for simple cases the email assistant might be good, but to truly make an email assistant that fully resembled the sender is difficult, especially since all the information that is relevant might not be in email format, for example it could have been said when meeting face-to-face and the email assistant has no idea about this. Also, the LLM's strong tendency to correct grammatical mistakes inhibits the sender's true writing style.