

## Appendix 1: Conversations

Initial meet with my client:

10/06/2021

In this all of the conversation with client sections, the client will be A, and I will be B.

B: Good evening, Dr Karamath.

A: Good evening.

B: I am currently planning my computer science project, the aim is to find a client who has an issue, and to create a program to solve the issue client has. Do you have any issues I may solve by making a program?

A: I don't really have any issues with teaching the class, however, in the current courses, there are topics about gravity attraction between planets. The gravity attraction simulations online are too heavy to load during class, and not every student has a powerful enough computer. Is it possible to create a lite version of similar program for me to teach students more effectively?

B: Sounds very interesting, I would like to try to plan it out, and meet you tomorrow, is that ok?

A: Great see you tomorrow!

Second meet with my client:

11/06/2021

B: Good morning, Dr Karamath.

A: Good morning!

B: I have planned it out, and it will be 2D program, because 3D is much harder to load on the computer. Is there any other things you would like to consider to be in the program?

A: Hmm, 2D sounds great. I would like for the program to be as simple as possible for my students to understand it well.

B: Oh ok, I will make a simple GUI, and will make sure that most of the components and functions will be easily understandable, thank you for meeting with me. See you next time.

Third meet with my client:

01/08/2021

B: Hi Dr Karamath, do you have time to look at semi-finished program? It would be great if you can suggest any changes I should make to it, to make it as efficient as possible for learning and teaching.

A: Hi, of course.

//After showing the functions and features of the program, the communication was as following.

A: Great program. Have you ever heard about AU (Astronomical Unit)?

B: I don't think so

A: It is often used by scientists to measure distance between celestial bodies. Using it, the program will not only be more professional, but also will remove those extra 0's from big numbers, they seem to be very long, which might be inconvenient for students to calculate.

B: I will surely implement the number form into the program.

A: It will be also amazing if you can add other forms such as standard and scientific forms, they will make the data more readable and easier to enter.

B: Sounds amazing, I am thinking of adding a drop down menu on top right corner of the screen. It will be very convenient, as the user can change the forms back and forth, instead of them being unchangeable.

A: That is a very nice idea, looking forward to see the final version of the program!

B: I will be working on the changes for around 3 days, I will message you once the program will be ready, ok?

A: Ok, thank you. See you later.

Fourth meet with my client:

05/08/2021

B: Afternoon Dr Karamath, I have finished the program, I have also implemented the feature you have suggested last time we met.

A: Great! I see the changes; the drop-down menu is very nice feature to have as it makes manipulating numbers much easier. I like the drop-down menu; it is very clear and straight forward.

B: Ok great, I will make a video about the functions too, then we will meet for the final time, where I will show you the final version of the program.

A: Looking forward for the final meeting!

B: Bye.

Final meet with my client:

13/08/2021

B: Good evening, Dr Karamath, I have finalized the program since the previous time, and I have also recorded the video on the program, I will send it to you if needed. The program is functioning correctly, I have come across some bugs and errors, but I have fixed them since our last meet.

A: Good evening. That's great!

B: Does the program meet your needs and criteria, and is it functioning as intended?

A: Yes, the GUI is simple enough, the simulation is based on physics equations so it's realistic. And it has many features, I am very satisfied with the program. You have also mentioned before that the default values of quantities for each planet are from a reliable source.

B: yes, the data is from a NASA website.

A: It is great to have such a program because most of the 2D simulations don't have such a great variety of features.

B: To start the program, please click on the index.html file in this folder. To be able to run this program, the student has to have the folder, or index.html file itself. The background image is not required, as I have set the default color of background to dark gray, but with the background it looks better.

A: I see, pretty simple way of running such an amazing program.

B: Thank you for your feedback, see you later!

A: See you later!