

Stats Clinic



Introduction and Pre-visit activities

espressoMaths (eM)

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Introduction

At Stats Clinic our purpose is to offer a triage system, where we aim to diagnose your data analysis needs and direct you to relevant resources to allow you to complete your data analyses.

If your query relates to the analyses of a dataset, we ask you to perform some preliminary steps that will enable you to be fully engaged with the solution for your data analyses problem, and make your visit to the Stats Clinic more efficient.

Before meeting with a statistician, we ask that you consider your research question and design of your study (or the layout of your data set). You should ensure that each row of your dataset represents one observation unit (e.g. the person / animal / plant etc. being observed) and each of the columns relates to one measurement of that observation unit.

This process is designed to give you the opportunity to learn and perform your own statistical analyses, with no prior knowledge of statistics assumed.

Prior to meeting a statistician, we ask you to first interact with 'generative AI' ChatGPT (see below). The prompts provided have been tried and tested to help you understand your analyses better.

Interactions with a statistician at espressoMaths are expected to last no longer than 10 minutes, thus some preliminary understanding gained from your interaction with ChatGPT will help you make the most of this time. In addition, the advice that ChatGPT can offer, extends further than the advice a statistician would be able to give you in the allotted espressoMaths time.

Understanding your research question

Prior to your interaction with ChatGPT (or a Stats Clinic advisor) you will need to identify your research question. You should have an awareness of what you are trying to measure or predict (response variable), and what factors you have or will collect data for that could impact measurements of that variable (explanatory variables). When you have an understanding of what you are trying to achieve, then you will be in a position to interact with ChatGPT.

Interaction with ChatGPT: Starting the dialogue

Open ChatGPT <https://openai.com/blog/chatgpt>

If necessary, see below 'Instructions for opening ChatGPT for the first time'; otherwise proceed to 'Interaction with ChatGPT: Recommended prompts'.

Instructions for opening ChatGPT for the first time

In your web browser, go to: <https://openai.com/chatgpt>

The screenshots that follow are based on sign up using a **desktop PC**. You may alternatively follow a similar approach using your mobile device and the app.

Select 'Sign up'

Get started

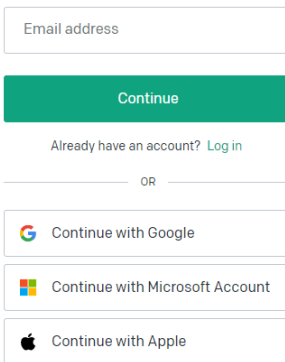


Enter your email address and select 'Continue'.
[Alternatively you can log in with Google, Microsoft or Apple]



Create your account

Note that phone verification may be required for signup. Your number will only be used to verify your identity for security purposes.

A form for creating an account. It features a text input field labeled "Email address". Below the input is a green button labeled "Continue". Underneath the button is the text "Already have an account? Log in". A horizontal line with "OR" in the center separates this from three social login options: "Continue with Google" (with the Google logo), "Continue with Microsoft Account" (with the Microsoft logo), and "Continue with Apple" (with the Apple logo).

Select a password.



Create your account

Note that phone verification may be required for signup. Your number will only be used to verify your identity for security purposes.

example@uwe.ac.uk	Edit
Password	
<input type="checkbox"/> RememberMe	<input type="checkbox"/>
Your password must contain:	
✓ At least 8 characters	
Continue	

Already have an account? [Log in](#)

Chat GPT will send you an email, click the link inside the email to get started.

Verify your email

Chat GPT will then ask you to enter some basic information about yourself. You may wish to check the terms and conditions and privacy policy by clicking the links.

Tell us about you

<input type="text" value="First name"/>	<input type="text" value="Last name"/>
<input type="text" value="Birthday"/>	
Continue	

By clicking "Continue", you agree to our [Terms](#) and acknowledge our [Privacy policy](#)

You will then be asked for your phone number. Enter your mobile phone number and click 'Send code'

A code will be sent to you to verify.

Enter the code that you will find in your phone messages into the box provided

Enter code

Please enter the code we just sent you.

[Resend code](#)

You are now ready to go! Select 'New Chat'

Interaction with ChatGPT: Recommended prompts

Step 1.

Insert the following prompt into ChatGPT:

I am going to ask a question about statistics. When answering me use the following approach: 1. Make your explanations comprehensible by an undergraduate degree student 2. Ensure your responses are precise and based on recognized knowledge. 3. Consult a variety of sources and contexts. 4. Avoid advancing societal stereotypes or biases. 5. State uncertainty if the answer isn't clear-cut. 6. Focus strictly on the subject without digressing. 7. Recommend exploratory data analyses and statistical tests I should perform. 8. Ask me questions one at a time until you thoroughly understand my research question and study design before providing a solution.

Here is my research question: **[insert details about what you are trying to achieve and what data you have / will have]**

Step 2.

ChatGPT will ask some important questions to gain an understanding of your research question and data collected. Please respond to each question fully, asking ChatGPT for clarification of a question where required.

Step 3.

ChatGPT will provide a solution, read and review its recommendations. We suggest that you further interact with ChatGPT using some of the following prompts that we have found useful:

- Please show me how to do **[insert name of analysis recommended by ChatGPT]** in **[insert the name of the statistical software you use]**;
- Please inform me how to interpret the results of **[insert name of analysis recommended by ChatGPT]**;
- What do you mean by **[insert any terminology used by ChatGPT that you do not understand]**?;
- Is there anything else that I should consider?

Step 4.

If you are happy with the solution then there may be no need to visit the statistician, however you may still wish to do so to check the advice given.

You may receive a referral from ChatGPT to see a statistics specialist, or would otherwise like further verification of the response from ChatGPT from a statistician. If this applies then please do visit the Stats Clinic in person. When visiting the Stats Clinic you should bring your ChatGPT conversation with you to speed up the process in the Stats Clinic. Please be advised that if you visit the Stats Clinic without evidencing your interaction with ChatGPT, we will direct you to this page to complete the suggested prompts in ChatGPT.

Example

The following is an example initial ChatGPT question and reply after using the Stats Clinic prompt to a student's research question. The student could follow up with use of ChatGPT to further understand this and/or return to Stats Clinic with this output to discuss its suitability and to be pointed to additional resources to help carry out the work.

The student has a dataset to analyse, they have done some preliminary thinking about their research question, as per 'Understanding your research question' and know that they are looking at the effects of several different immobilisation devices on radiation dose, and have recorded dose after 3 weeks, and dose at baseline.

They then have proceeded to enter prompts into ChatGPT as per the screenshot below:



I am going to ask a question about statistics. When answering me use the following approach:

1. Make your explanations comprehensible by an undergraduate degree student
2. Ensure your responses are precise and based on recognised knowledge.
3. Consult a variety of sources and contexts.
4. Avoid advancing societal stereotypes or biases.
5. State uncertainty if the answer isn't clear-cut.
6. Focus strictly on the subject without digressing.
7. Recommend exploratory data analyses and statistical tests I should perform.
8. Ask me questions one at a time until you thoroughly understand my research question and study design before providing a solution.

Here is my research question:

In my research i will be looking at the effects of several different immobilisation devices on radiation dose, and recording the changes in dose compared to a baseline. What test should I use?



To determine the effects of several different immobilization devices on radiation dose and compare them to a baseline, you can use a statistical test called Analysis of Variance (ANOVA). ANOVA is a suitable choice when you have more than two groups to compare, as it allows you to assess whether there are statistically significant differences among the groups. In your case, the groups would correspond to the different immobilization devices, and you want to see if there are any significant differences in radiation dose compared to the baseline.

Here's how you can approach your research question:

1. **Understand Your Data:** First, ensure that you have a clear understanding of your data. You should have measurements of radiation dose for each immobilization device and for the baseline. It's important to know the characteristics of your data, such as whether it follows a normal distribution.
2. **Data Exploration:** Start with exploratory data analysis (EDA) to visualize your data. You can use box plots or histograms to compare the distributions of radiation doses for each immobilization device and the baseline.
3. **Formulate Hypotheses:** Based on your research question, you need to formulate null and alternative hypotheses. For example:
 - Null Hypothesis (H₀): There are no significant differences in radiation dose among the different immobilization devices.
 - Alternative Hypothesis (H_A): There are significant differences in radiation dose among the different immobilization devices.
4. **Perform ANOVA:** Conduct a one-way ANOVA test. This test will assess whether there are statistically significant differences in radiation dose among the different immobilization devices. If the p-value from the ANOVA test is less than your chosen significance level (e.g.,

Responsible use of generative AI

UWE Bristol is committed to harnessing the transformative potential of generative AI to enhance learning, teaching and assessment.

Find out more about the UWE Bristol Principles for using generative AI:

[Principles for using generative artificial intelligence \(AI\) - Academic information | UWE Bristol](#)

Responsible and ethical use of AI is encouraged by the Stats Clinic, to uphold the highest standards of integrity, fairness, and accountability.

The library offers a more detailed introduction to generative AI including: strengths; limitations; good practice and correct attribution:

[Study skills - Study support | UWE Bristol](#)

Feedback

We are currently developing the Stats Clinic, and would very much like to hear about your experience using this service and ChatGPT, and how it helped you with your analyses.

Please do visit the Stats Clinic to share your thoughts on good and not so good aspects of any interactions.

Alternatively, please give us feedback in the text box in our espressoMaths questionnaire [here](#). (Please start your response with 'Stats Clinic', and also let us know if you interacted with the Stats Clinic staff or ChatGPT or both)

Disclaimer

If this service is being used for an assignment or dissertation, you should check your module handbook / module leader / assessment guidelines relating to the use of AI.

Various AI tools are available, and their functionality may vary, especially as AI technology evolves, making rigorous testing by the Stats Clinic unfeasible. Therefore, it is the user's responsibility to ensure the suitability of these tools for their purposes, and to use them responsibly.

The guidance from the Stats Clinic team, ChatGPT and other AI, comes with no guarantee.