

Intro to R, plus some modeling

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Goals for today

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2. Go through discrete time model of headaches

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3. Go through non-infectious ODE model of headaches

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1. Make sure everybody has `git`, RStudio, and `tidyverse` installed and can run code
2. Go through discrete time model of headaches
3. Go through non-infectious ODE model of headaches
4. Go over questions from headaches worksheet

Did anybody here have trouble installing R?

Can you run this command with no errors?



Can you run this command with no errors?






If not, make sure you ran

first.

Do you have the headache.zip file from Canvas?

R Tips

- In  highlight the code you want to run in the source panel (upper left) and use  or  to run it in the console

R Tips

- In `Source` highlight the code you want to run in the source panel (upper left) and use `Run` or `Run & Source` to run it in the console
- Comment (`#`) your code as you build models (or as Caroline builds them)
 - In a week you'll probably forget why you wrote something some way

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- Drawing the model and writing the equations first helps (a lot)

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- We will give you templates for your code
 - You should not be doing this from scratch!

R Tips

- In `Source` highlight the code you want to run in the source panel (upper left) and use `Run` or `Run & Save` to run it in the console
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- Use `args` to see the arguments for functions

R Tips

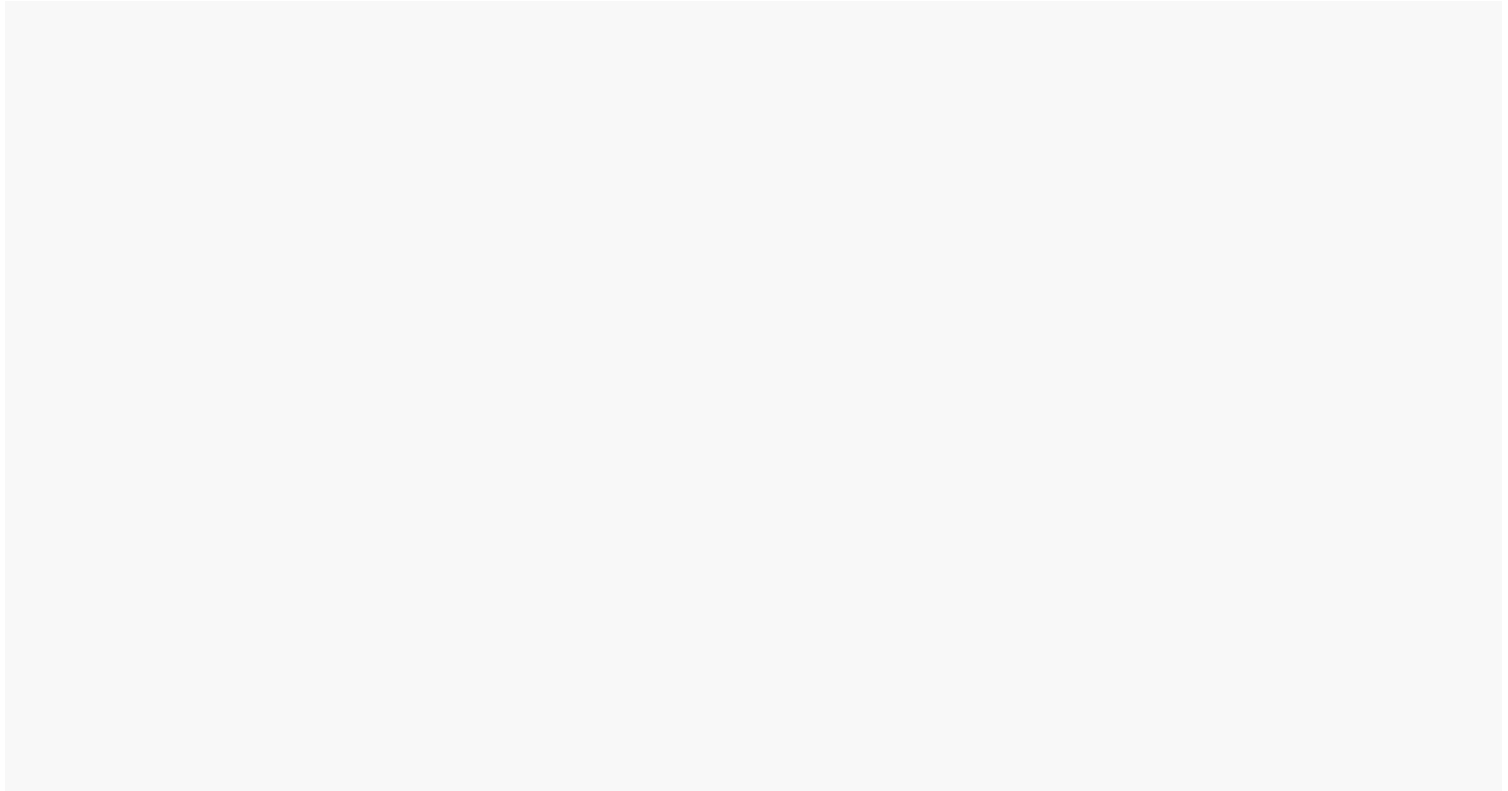
- In `Ctrl+L` highlight the code you want to run in the source panel (upper left) and use `Ctrl+R` or `Cmd+R` to run it in the console
- Comment (`#`) your code as you build models (or as Caroline builds them)
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 - You should not be doing this from scratch!
- Use `args()` to see the arguments for functions
- Use `=>` to quickly make an assignment (`<=`)

R Tips

- In `editSource` highlight the code you want to run in the source panel (upper left) and use `runCode` or `runToCursor` to run it in the console
- Comment (`#`) your code as you build models (or as Caroline builds them)
 - In a week you'll probably forget why you wrote something some way
- Drawing the model and writing the equations first helps (a lot)
- We will give you templates for your code
 - You should not be doing this from scratch!
- Use `args` to see the arguments for functions
- Use `<-` to quickly make an assignment (`<-`)
- It'll be ok! We don't expect you to be masters

Discrete model of headaches

- Here is `discrete_model.py` with comments removed:



- What's happening in this code? Line-by-line.

Discrete model of headaches

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Discrete model of headaches

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- Write out the equations.

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Differential Equation model of headaches

- Where are the differential equations for our model?

Differential Equation model of headaches

- Write them out.

Differential Equation model of headaches

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Differential Equation model of headaches

- Write them out.
 - N refers to "no headache" compartment
 - H refers to "headache" compartment

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Differential Equation model of headaches

- How would the model change if we add births and deaths?

Differential Equation model of headaches

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Differential Equation model of headaches

- Verify that $\frac{dH}{dt}$ is equal to the
 - prevalence
 - $H(t)$
 - incidence
 - duration
 - incidence x duration
 -

Any other questions?