

Geog-364: Introduction to R

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Contents

1	Lab 1	5
1.1	Introduction	5
1.2	Installing R and R-studio	5
1.3	Getting started	5
1.4	Lab challenge 1	6
1.5	R coding basics	6
1.6	Lab Challenge 2	7
1.7	Create a R-Markdown document	7
1.8	“Friendly text”	7
1.9	Lab Challenge 3	7
1.10	Online courses and resources	7
2	Lab 2	9
2.1	Learning objectives	11
2.2	Lab set-up	11
2.3	Data.frames and summary statistics	11
2.4	Converting to spatial data	11
2.5	Assigning a map projection	11
2.6	Interactive Leaflet plots	11
2.7	Describe the Ghana data	11
2.8	Show me something new	11
2.9	Lab submission check	11

3 Lab 3	13
3.1 Learning objectives	15
3.2 Lab 3 Set-Up	15
3.3 Initial Data exploration	15
3.4 Lab-3 Challenge 1	15
3.5 Mean Centre and Standard Ellipse	15
3.6 Lab-3 Challenge 2	15
3.7 Global Density analysis	15
3.8 Lab-3 Challenge 3	15
3.9 Local intensity - quadrat analysis	15
3.10 Lab-3 Challenge 4	15
3.11 Issues with quadrat analysis	15
3.12 Lab-3 Challenge 5	15
3.13 Kernel Density Estimation (KDE)	15
3.14 Lab-3 Challenge 6	15
3.15 Automatically calculating an “optimal” bandwidth	15
3.16 Lab-3 Challenge 7	15
3.17 Lab-3 Show me something new	15
3.18 Lab-3 submission check	15
4 TEST 1	17
4.1 Set up the data	17
4.2 Lanternfly analysis	17
4.3 Beetle analysis	17
5 Lab 4	19
5.1 Lab 4 Set-Up	20
5.2 Challenge 1, Exploratory analysis	20
5.3 Challenge 2, set up the data	20
5.4 Challenge 3, Make data ppp	20
5.5 Challenge 4, quadrat analysis	20
5.6 Challenge 5, elevation links	20

CONTENTS	5
5.7 Challenge 6 Nearest neighbour	20
5.8 Challenge 7 L Analysis	20
5.9 Challenge 8 Show me something new	20
5.10 Lab-4 submission check	20
6 Lab 5	21
6.1 Lab 5 Set-Up	23
6.2 Challenge 1: Explore the data	23
6.3 Challenge 2: Exploratory analysis	23
6.4 Challenge 3: Thiessen polygons by hand	23
6.5 Challenge 4: Thiessen polygons in R	23
6.6 Challenge 5: Inverse Distance Weighting info	23
6.7 Challenge 6: Inverse Distance Weighting code	23
6.8 Challenge 7: Checking accuracy	23
6.9 Challenge 8: Your own IDW	23
6.10 Challenge 9 Show me something new	23
6.11 Lab-5 submission check	23
7 Lab 6	25
7.1 Lab 6 Set-Up	27
7.2 Tutorial 1: Spatial weights & Join Counts	27
7.3 Challenge 1: Join Counts	27
7.4 Tutorial 2: Social vulnerability and Moran's I	27
7.5 Challenge 2: Your own spatial analysis	27
7.6 Challenge 3 Show me something new	27
7.7 Lab-5 submission check	27

Chapter 1

Lab 1

Placeholder

1.1 Introduction

1.1.1 Why is this class in R?

1.1.2 What are R and R-studio?

1.1.3 What are R-Markdown & R-Shiny?

1.2 Installing R and R-studio

1.2.1 I have R/R-studio installed already

1.2.2 Installing R/R-studio for the first time

1.3 Getting started

1.3.1 Open R-studio

1.3.2 Change a few settings

1.3.3 Create an R-project

1.3.3.0.1 If you're having issues at this point or haven't managed to get to this step, STOP! Ask Dr Greatrex, Saumya or Harman for

help.

1.4 Lab challenge 1

1.5 R coding basics

1.5.1 Basic arithmetic

1.5.1.0.1 What if I press Enter too soon?

1.5.2 Comparing things

1.5.3 Variables and assignment

1.5.3.0.1 Combining variables

1.5.4 Functions

1.5.4.1 Command help

1.5.5 Packages

1.5.6 Coding help

1.6 Lab Challenge 2

1.7 Create a R-Markdown document

1.7.1 What is markdown?

1.7.2 Creating a notebook document

1.7.3 Text formatting (in the white area)

1.8 “Friendly text”

1.9 Lab Challenge 3

1.10 Online courses and resources

Chapter 2

Lab 2

Placeholder

2.1 Learning objectives

2.2 Lab set-up

2.2.1 Create a Lab 2 Project

2.2.2 Markdown adding a theme

2.2.3 Installing common spatial packages

2.2.4 Download data for this lab

2.3 Data.frames and summary statistics

2.3.1 Reading in your first file

2.3.2 Summarising data

2.3.3 Selecting columns and rows

2.3.4 Basic plot

2.4 Converting to spatial data

2.4.1 Making a data.frame “spatial”

2.4.2 Reading in vector line data (rnaturalearth)

2.5 Assigning a map projection

2.5.1 Checking a projection in the sp package

2.5.2 Assign/changing projections in the sp package

2.5.3 Map projections in the sf package

2.6 Interactive Leaflet plots

2.7 Describe the Ghana data

2.8 Show me something new

2.9 Lab submission check

Chapter 3

Lab 3

Placeholder

3.1 Learning objectives

3.2 Lab 3 Set-Up

3.2.1 Create your Lab 3 project file

3.2.2 Install new packages

3.2.2.1 Install the spatstat package

3.2.2.2 Install the car package

3.2.3 Create your NoteBook file

3.3 Initial Data exploration

3.3.1 Loading the data

3.3.2 Reading more information

3.4 Lab-3 Challenge 1

3.5 Mean Centre and Standard Ellipse

3.6 Lab-3 Challenge 2

3.7 Global Density analysis

3.8 Lab-3 Challenge 3

3.9 Local intensity - quadrat analysis

3.10 Lab-3 Challenge 4

3.11 Issues with quadrat analysis

3.12 Lab-3 Challenge 5

3.13 Kernel Density Estimation (KDE)

3.14 Lab-3 Challenge 6

3.15 Automatically calculating an “optimal” bandwidth

Chapter 4

TEST 1

Placeholder

4.1 Set up the data

4.2 Lanternfly analysis

4.3 Beetle analysis

Chapter 5

Lab 4

Placeholder

5.1 Lab 4 Set-Up

5.1.1 Create your Lab 4 project file

5.1.2 Create your NoteBook file

5.1.3 Download and run packages

5.2 Challenge 1, Exploratory analysis

5.3 Challenge 2, set up the data

5.3.1 A. Read in and explore the point data

5.3.2 B. Read in the other data and set projections

5.4 Challenge 3, Make data ppp

5.5 Challenge 4, quadrat analysis

5.6 Challenge 5, elevation links

5.7 Challenge 6 Nearest neighbour

5.8 Challenge 7 L Analysis

5.9 Challenge 8 Show me something new

5.10 Lab-4 submission check

Chapter 6

Lab 5

Placeholder

6.1 Lab 5 Set-Up

6.1.1 Create your Lab 5 project file

6.1.2 Create your NoteBook file

6.1.3 Style guide

6.1.4 Download and run packages

6.2 Challenge 1: Explore the data

6.2.1 Download & load the data

6.2.2 Initial analysis

6.2.3 Convert to spatial data

6.2.4 Add a projection

6.3 Challenge 2: Exploratory analysis

6.3.1 Make plots in tmap

6.3.2 Exploratory analysis

6.4 Challenge 3: Thiessen polygons by hand

6.5 Challenge 4: Thiessen polygons in R

6.6 Challenge 5: Inverse Distance Weighting info

6.7 Challenge 6: Inverse Distance Weighting code

6.8 Challenge 7: Checking accuracy

6.9 Challenge 8: Your own IDW

6.10 Challenge 9 Show me something new

6.11 Lab-5 submission check

Chapter 7

Lab 6

Placeholder

7.1 Lab 6 Set-Up

7.1.1 Create your Lab 6 project file

7.1.2 Create your NoteBook file

7.1.3 Style guide

7.1.4 Download and run packages

7.2 Tutorial 1: Spatial weights & Join Counts

7.2.1 Making the grid

7.2.2 Creating the spatial weights

7.2.3 Conducting a join-counts analysis

7.3 Challenge 1: Join Counts

7.3.1 Challenge 1a

7.3.2 Challenge 1b

7.4 Tutorial 2: Social vulnerability and Moran's I

7.4.1 Download the data

7.4.2 Read the data into R

7.4.3 Change the projection

7.4.4 Explore the data

7.4.5 Creating a spatial weights matrix

7.4.5.1 Moran's I scatterplot

7.5 Challenge 2: Your own spatial analysis

7.6 Challenge 3 Show me something new

7.7 Lab-5 submission check