

F78PA 2017-18: R Assessment 1

Let n be a positive integer and let t be a positive real number. Your task is to write R code that will calculate the integer $i \in \{1, 2, \dots, n\}$ which minimizes the function

$$g(i) = i \sin(t\sqrt{i})$$

for any given values of n and t .

Note that you are not asked to calculate the value of the minimum, only the value of i at which the minimum of $g(1), g(2), \dots, g(n)$ is attained.

How the assessment is marked

This assessment counts for 2.5% of your mark for the course.

There are a total of 5 marks available for this assessment. The assessment will be marked as follows:

- Your R code will be tested by running it for 4 randomly selected pairs of values, n and t . 1 mark will be awarded in each case where your code successfully calculates the value of i minimizing the function g above.
- 1 mark will be awarded for the presence of suitable brief comments in your R code explaining the purpose of each line or group of lines of code.

Plagiarism and collusion

The R code you submit must be **entirely your own work**. You should not discuss this assessment or the R code you are writing for it with anyone else. All assessment submissions will be automatically checked for signs of plagiarism. **Plagiarism** is a serious academic offence and carries a range of penalties, some very serious. Copying a friend's code, or copying code from another source, is plagiarism. **Collusion** is also a serious academic offence. You must not share a copy of your computer code (as a hard copy or in electronic form) with anyone. **You must always refuse any request from another student for a copy of your code**. Penalties for plagiarism or collusion can include voiding of your mark for *the entire course*.

Preparing and submitting your work

Follow the steps below carefully to ensure that your work is submitted in the correct format:

continued overleaf

1. Prepare your R code to complete the task above. Note that you are aiming to produce code that will solve the problem given for *any* values of n and t .

When preparing your R code, use the following variable names:

- The variable name `n` to represent n .
 - The variable name `t` to represent t .
 - The variable name `i` to represent the value i minimising the function g , as defined above.
2. You can check your R code by using the data in the file `data.csv`, which is available on Vision. This file consists of three columns of data. The first two columns are, respectively, randomly chosen values of n and t . The final column gives the corresponding value of i minimizing the function g . You can check that your R code gives the same value of i as listed here.
 3. Download the file `template.R`, which is available on Vision. Once you are satisfied that you have working R code, copy your code into the space indicated in the file `template.R`. **When copying your code, DO NOT include any R commands assigning values to n , t , or i . Including such commands may cause your work to be marked incorrectly.**

Rename this file that you have created with **your own student identity number** (for example, `H00123456.R`). This R file should be submitted through Turnitin. The submission page is available through the Assessment section of the course Vision page, in the folder called 'R Assessment 1'.

The deadline for submissions is **10am (UK time) / 5pm (Malaysian time) on Tuesday 17 October 2017**. Late submissions will receive zero marks.