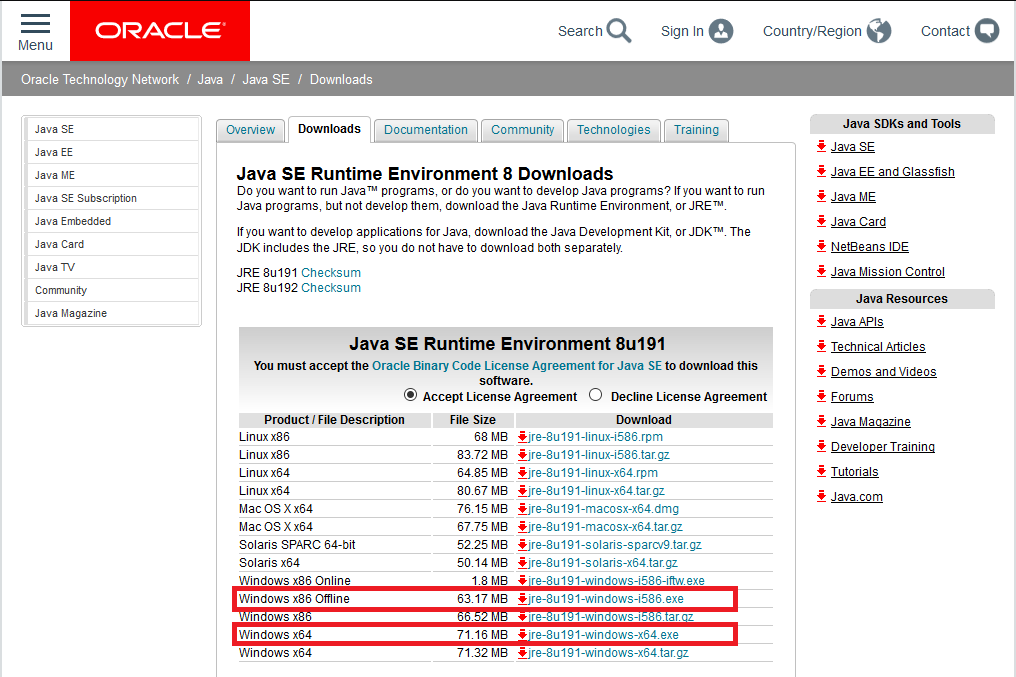
**Instructions to install and use ‘Gametes Simulator’ software**

**Previous steps**

Gametes simulator software needs to have installed previously, the last version of JRE Java in the operative system of your computer.

To install the last version of JRE Java: <https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>



If you are going to install JRE Java for the first time in your computer, first you should know if your computer is a 32 bits device or a 64 bits device. As a general rule, those computers with more than 4GB of memory generally are a 64 bits device. On the other hand, those computers with less than 4GB of memory are a 32 bits device.

If your computer is a 32 bits device download Java from the link inside the first red rectangle in the aforementioned chart, or use the following direct url:

<https://download.oracle.com/otn-pub/java/jdk/8u191-b12/2787e4a523244c269598db4e85c51e0c/jre-8u191-windows-i586.exe>

If your computer is a 64 bits device download Java from the second link inside the second red rectangle in the chart, or use this direct url:

<https://download.oracle.com/otn-pub/java/jdk/8u191-b12/2787e4a523244c269598db4e85c51e0c/jre-8u191-windows-x64.exe>

Then follow the Java instructions given during the installation.

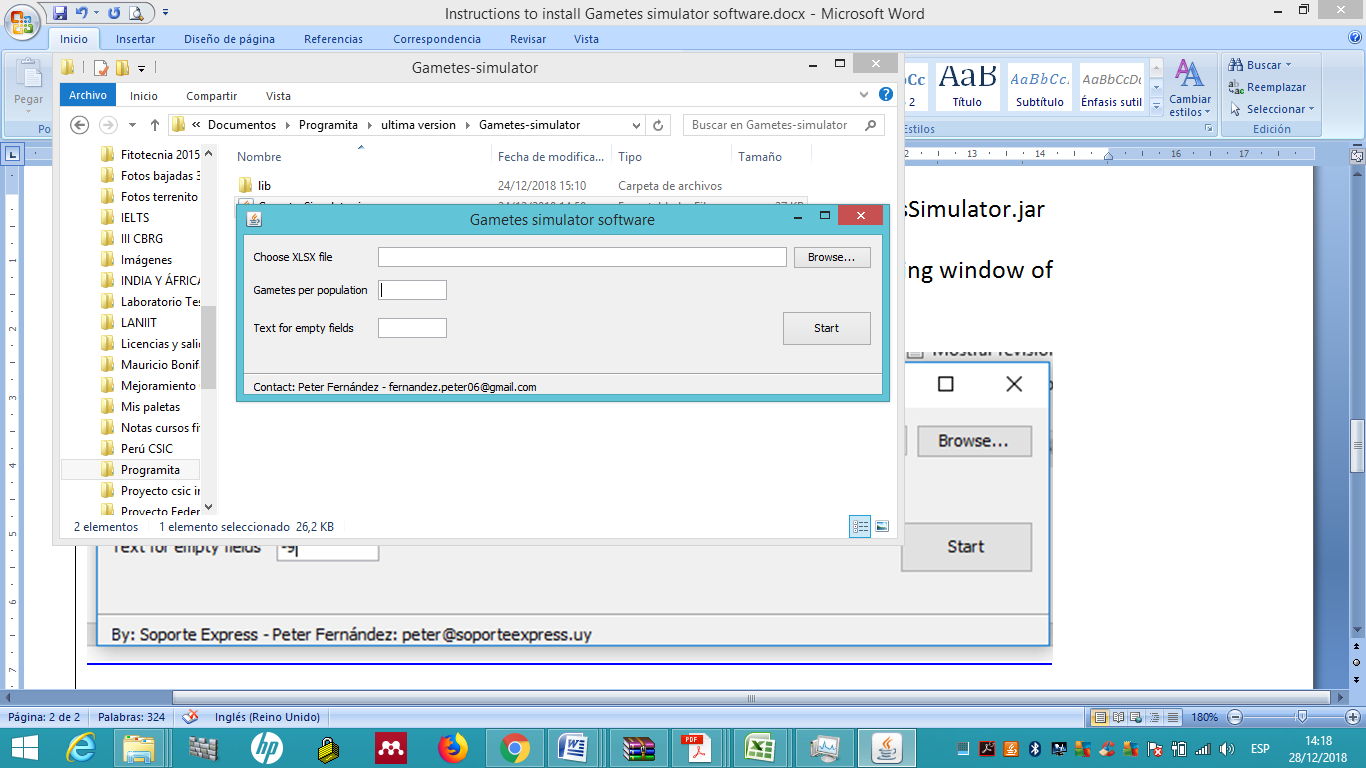
**First steps: How to install and run ‘Gametes Simulator’ software**

Once you have installed Java JRE in your computer you should enter to this URL: <https://github.com/pfernandezgr/gamete-simulator/>

Press the green button where says Clone or download, choose download zip, save it in the directory you prefer, and then extract the files in the selected directory.

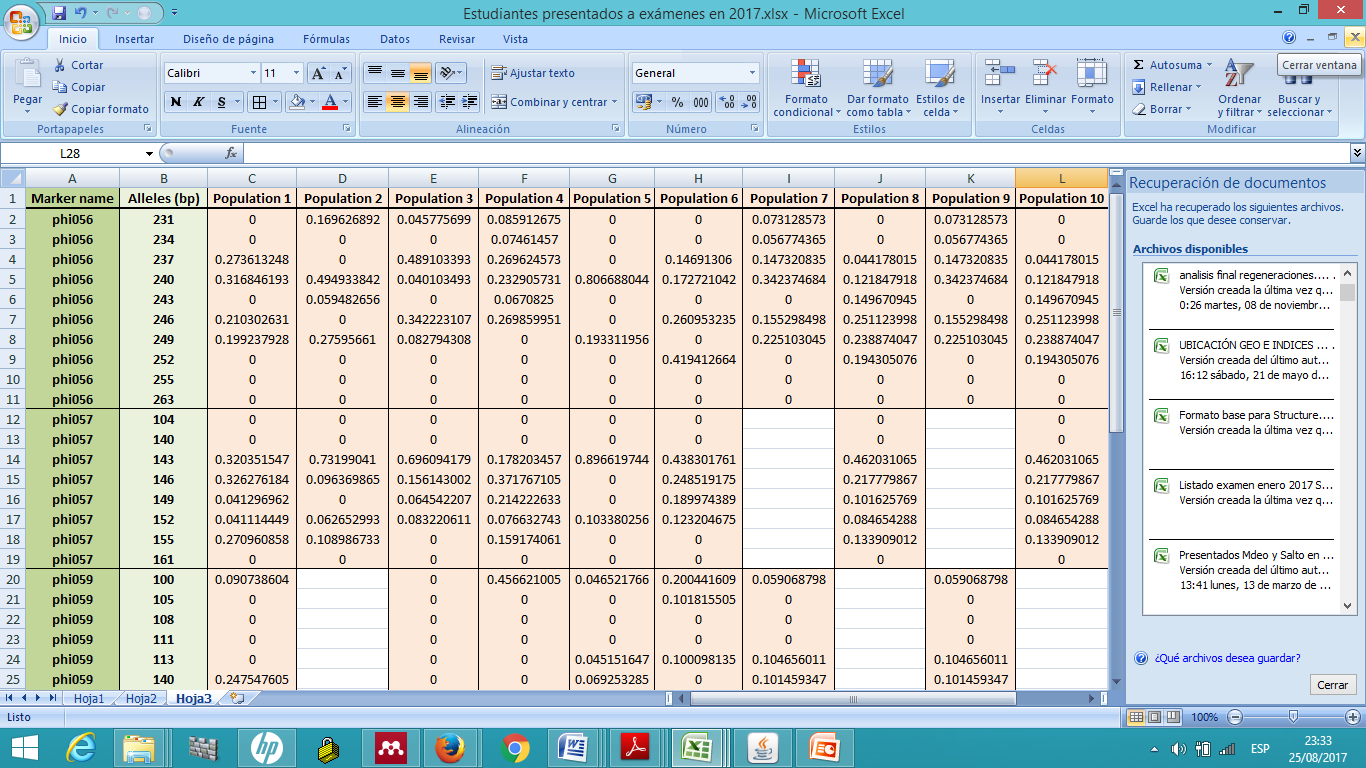
After extracting the files, you will see a folder called **‘**Gamete-simulator-master**’**. Open this folder and after that will appear six files (which correspond to the instructions, input and output databases to see as examples) and a new folder called **‘**gamete-simulator**’**; open this new folder.

After that do double click over the file GametesSimulator.jar, and the following window of dialogue is going to appear:



This is the main window in Gametes Simulator Software. First press the **‘**Browse...**’** button and choose the XLSX file

The XLSX file must be in the format indicated in Figure 1 in this document or according to Table 1 shown in the article published in the journal Crop Breeding and Applied Biotechnology.

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**Figure 1**. Matrix of allelic frequencies in populations genotyped by bulk-DNA sampling or other procedures. The first column contains the markers used to genotype the populations, the second column provides the names of the alleles found for each marker (expressed in base pairs in this example), and the following columns provide the allelic frequencies found in each genotyped population. The first row provides headings representing the marker, allele, and population names. Missing data correspond to empty cells (for example, when a population was not genotyped with a certain molecular marker).

If you do not have yet your own data file you can try this software uploading the file number 2 called: **‘**Example of Input Data Base Gametes Simulator Software.xlxs**’** situated inside the **‘**gamete-simulator-master**’** folder. Then write the number of gametes to be simulated within each population (called Gs in the CBAB article), and write the character or text that will fill empty spaces as required for the output ( If you are going to use the output of this programme as input in Structure v.2.3.4 you should put -9). Finally, press **‘**Start**’**.

If the input database is too big, with so many markers and populations, the number of gametes to be simulated (Gs) should be affordable by the RAM (Random Access Memory) of your computer in order to work properly. Two consecutive and different outputs are generated after press **‘**Start**’** and during the running of Gametes Simulator Software. Examples of the first and second output files are shown in the website named as: **‘**First output Gametes Simulator Software.xlsx**’** and **‘**Second output Gametes Simulator Software.xlsx**’**. Both outputs are Excel files that should be named and stored in the selected directory. The second excel file is the one which should be used to prepare the .txt file that it will be used as input in the Structure programme v.2.3.4 (Pritchard et al. 2000).

**Final step: How to prepare the second output to fits as input into Structure program v.2.3.4**

The input of Structure v.2.3.4 should be a .txt file with the format established by (Pritchard et al. 2000; Falush et al. 2003)

To prepare it take the final (second) output generated by Gametes Simulator Software and you should transform it into the format that is shown in the excel data base **‘**Second output with only the information and format required for Structure.xlsx**’** then your transformed database should be stored as a .txt file.

To access to a more detailed explanation about how to prepare a file to be used as input in Structure program v.2.3.4 see Pritchard et al. 2000 and Falush et al. 2003.