

In this lab, students will practice how to use module in Fortran 90 programs.

The file `lab5-1.f90` is the source codes for a module called `lab5` which includes two functions:

- A real valued function `Round` that has a real argument `rnum` and an integer argument `dig` and that returns the value of `rnum` rounded to `dig` places. For example, the function references `round(10.536, 0)`, `round(10.536,1)`, and `round(10.536, 2)` should give the values 11.0, 10.5, and 10.54, respectively. Note that the value of `rnum` $\times 10^{\text{dig}}$ should be less than $2^{31} - 1$.
- A real valued function `bacteria` which returns the value:

$$N \cdot e^{kt}$$

where N is the initial population, k is a rate constant and t is time. This function can be used to estimate the number of bacteria in a culture.

Students are asked to do the following things.

1. Download the file `lab5-1.f90` from the course web and read the codes so that the file can be used for the next two questions.
2. Write a Fortran program to test the function `round`.
3. Write a Fortran program to test the function `bacteria`.