1 Overview

In this practical we will examine floating point arithmetic. provides an overview of UNIX/Linux.

Again you need to have copied the source code from BrightSpace/Canvas. As a reminder, here is the information about transferring files to the VM.

2 Transferring Files

Before we move onto the next section we need to transfer files from BrightSpace/Canvas to the VM. The first step is to copy any files from BrightSpace/Canvas onto your own personal computer. Then to copy them from your computer to the VM, we need to have *scp*, which stands for secure copy. Again for UNIX and Mac users you should already have this. To copy *printing.c* to the VM use the command below. The copy is from the source to the destination, hopefully you can see that the file is being copied from your local machine to the VM.

```
scp printing.c sp1@sciprog.training.ichec.ie:~/.
```

3 Exercises

- For this exercise you need to have *Conversion.c* or *Conversion.f*90.
  1. Compile and the program.
  2. Notice that as we explained in the lectures the floating point and integer presentations do not give the correct result.
  3. How many binary digits are there in the number and how many can a float/real represent. There are 25 binary digits
  4. Let's say we want to check the number of binary digits. Construct an expression in the code that will do this.
  5. For C use the function *logf*, which is part of the maths library.
  6. For FORTRAN use the intrinsic function *log*.
- For this exercise use *Sum.c* or *Sum.f*90.
  1. Complete the code to make the sum
  $$1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\cdots+\frac{1}{1000}$$
  2. Print out the difference between the two sums.
  3. Is there a difference between *sum*1 and *sum*2 and are the two sums mathematically the same or not? Yes, there is a difference of 0.000007
- We have not covered much of the syntax in C and FORTRAN, so do not worry if you cannot *read* the two programs.
- Concepts such as loops and how to construct them will be covered next week.