# Numerical Analysis

Math 370 Fall 1998 MWF 11:30am - 12:25pm
 Fowler 127

*Class 5*: **Monday September 14**

**SUMMARY** Introduction to Algorithms and Pseudocode
**CURRENT READING** Burden & Faires Sections 1.3

## Machine Precision

There is a number $\epsilon_m$ such that $1 + \delta = 1$ whenever $\delta < \epsilon_m$
For **exact arithmetic**, $\epsilon_m$ is **zero**.
However, on a computer (calculator) $\epsilon_m$ is non-zero. We want to compute what it is for *your* calculator.

**Exercise**
Write down (in your own words) the meaning of the following terms:
ALGORITHM :

PSEUDOCODE :

Consider the following algorithm to compute $\epsilon_m$, the machine precision:

```
epsilon = 1;
it = 0;
maxit = 100;
while it < maxit
   epsilon = epsilon/2;
   b = 1 + epsilon;
   if (b == 1)
      break;
   it = it + 1;
end
```

**Example**
Can we *parse* the above code in order to *execute* the given algorithm?

**Exercise**
Find the machine precision of your calculator.

GROUPWORK
Write an algorithm to compute the average of $N$ numbers