Statistics 243: *class notes*

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1 Pre-processor, Macro Substitution, Conditional Compilation

To get online help for the NAG Library at the SCF, type `xnaghelp`. For Matlab help, type `helpdesk`.

`cdecl` is a UNIX program which gives you help on declarations.

Another command in the global and static world:

```
register double y;
```

If there is a register available and if the compiler is so written, it will be assigned to a register. Since the variable is in a register, it is accessed faster.

Do a block once:

```
static int first=1;
if(first){
    <code>
    first=0;
}
```

1.1 preprocessor

`cpp -E` or `cc -E` will run only preprocessor statements like `#include`,`#define`. You can specify additional directories to search for header files when using `cc -E`.

1.2 Macro Substitution

```
#define EPSILON 1.e-8
if(x<EPSILON){ }
```

is identical to

```
if(x<1.e-8)
```
This is pure text substitution.

Other examples:

```
#define MAX(a,b)   ((a) >(b) ? (a) : (b))

3*MAX(z+1,y)          /* same as:   3 * z+1 > y ? z+1 : y */
```

```
#define ABS(X) ((X) > 0 ? (X) : (-(X)))

y=ABS(f(X));      /* same as:  y = ( f(X) > 0 ? f(X) : -f(X))

/* Or, this way might be better:  */

Z=f(X);
y=ABS(Z);
```

1.3   Conditional Compilation

```
#if CONSTANT
    <code>
#endif
```

For example, in some file or header file:
```
#define DEBUG 1
#if DEBUG
#endif
```