tabulate.c

```
/* Tabulates values of trigonometric functions */

#include <math.h>
#include <stdio.h>

void tabulate(double (*f)(double), double first,
              double last, double incr);

int main(void)
{
  double final, increment, initial;

  printf("Enter initial value: ");
  scanf("%lf", &initial);

  printf("Enter final value: ");
  scanf("%lf", &final);

  printf("Enter increment: ");
  scanf("%lf", &increment);

  printf("\n      x         cos(x)"
         "\n   -------    -------\n");
  tabulate(cos, initial, final, increment);

  printf("\n      x         sin(x)"
         "\n   -------    -------\n");
  tabulate(sin, initial, final, increment);

  printf("\n      x         tan(x)"
         "\n   -------    -------\n");
  tabulate(tan, initial, final, increment);

  return 0;
}

void tabulate(double (*f)(double), double first,
              double last, double incr)
{
  double x;
  int i, num_intervals;

  num_intervals = ceil((last - first) / incr);
  for (i = 0; i <= num_intervals; i++) {
    x = first + i * incr;
    printf("%10.5f %10.5f\n", x, (*f)(x));
  }
}
```

`tabulate` uses the `ceil` function, which also in `<math.h>`. When given an argument `x` of `double` type, `ceil` returns the smallest integer that's greater than or equal to `x`.

Here's what a session with `tabulate.c` might look like: