CSE112 Fall 2004-2005 Final

1 String to Double *(40 points)*

Write a C **function** that takes a string as an argument, and returns its numeric value as a double. We will assume that the string contains a positive number, and consists of digits and possibly a decimal point only. So, the string passed to the function could be “21.34”, “123.08”, “.72”, or “007”. The prototype should be:

```
double stringToDouble(const char *s);
```

You *may not* use any C library functions in the implementation of this function. (Recall that the character codes that represent the digits are not equal to the digits. Also, you may make use of the fact that digits are arranged sequentially starting with ’0’ in the character set.)

2 Word Count *(40 points)*

Write a C **function** that takes a filename as an argument, and if that file exists, calculates and returns the number of words in the file. A “word” is defined to be any continuous length of non-whitespace characters separated by whitespace characters. For this question, assume that whitespace characters are spaces (`' '`), tabs (`'\t'`), newlines (`'\n'`) and return characters (`'\r'`).

```
int wordCount(const char *filename);
```

3 What am I Doing? *(20 points)*

```
int zomtrik(int a, int b)
{
  int z = 0, c = 0;
  int i;


  for (i = 0; i <= 31; i++) {
    z |= (1 << i) & (a ^ b ^ c);
    c = (1 << i) & ((a & b) | (a & c) | (b & c));
    c <<= 1;
  }

  return z;

}
```

Explain what this function does, assuming integers are 32 bits long. Write another (much shorter and simpler!) function that produces the same return value. (*Hint: Try a few small values for the arguments...*)