CS3021/3421 Tutorial 1

Consider the following C/C++ code segment.

```
int g = 4;

int min(int a, int b, int c) {
    int v = a;
    if (b < v)
        v = b;
    if (c < v)
        v = c;
    return v;
}

int p(int i, int j, int, k, int l) {
    return min(min(g, i, j), k, l);
}

int gcd(int a, int b) {
    if (b == 0) {
        return a;
    } else {
        return gcd(b, a % b);
    }
}
```

Q1. Translate the code segments above into IA32 assembly language using the basic code generation strategy outlined in lectures. You may then generate optimised versions of your code. The % operation can be implemented using the IA32 cdq and idiv instructions.

Q2. What is the maximum depth of the stack (in stack frames) during the calculation of gcd(14, 21)? Draw a diagram showing the state of the stack at its maximum depth during the calculation of gcd(14, 21).

Q3. Using Visual Studio (or similar), create a Win32 application with files t1.h and t1.asm containing the IA32 assembly language for min, p and gcd. Use t1Test.cpp to test min, p and gcd. Hand in code listings and a snapshot of the console window showing evidence that your program works.