CS3233 Homework 1

Due on 29 July 2000 at 9:30am. 50 marks
Note: Do all your experiments in `sun450`.

1. Compile and run the following *one line* Java program:

```
class P{public static void main(String[]a){char d=34,e=39;String
t="+d+t;System.out.println(t+d+';t='+d+t.replace(e,d));}}";t="class
P{public static void main(String[]a){char d=34,e=39;String
t="+d+t;System.out.println(t+d+";t="+d+t.replace(e,d));}}
```

   (a) What does it do? [4]
   (b) Construct a shorter Java program that does the same thing. [3]
   (c) Construct a C program that does the same thing. [3]

2. Compile and run the following C program:

```
#include <stdio.h>

int main(void) {
    printf("%d\n", /*/*/0*/**/1);
    return 0;
}
```

   (a) What does the program output? [4]
   (b) Explain what it means if the program outputs `0`. [3]
   (c) Explain what it means if the program outputs `1`. [3]

3. Consider the following C/C++ program:

```
#include <stdio.h>

#define F(x) (x)((x)-1)

int main(void) {
    printf("%d\n", 2//*5*/
        -1);
    return 0;
}
```

   (a) Compile it as a C program using: `cc something.c`
   What does the compiled program output? [2]
   (b) Compile it as a C++ program using: `g++ something.cpp`
   What does the compiled program output? [2]
   (c) Explain your findings. [3]
   (d) Give an example where the macro `F` can be used to produce something that is syntactically correct in C. [3]

4. Compile and run the following C++ program:

```
#include <iostream>

void exchange(int p, int q) {
    int r;
    r = p;
    p = q;
    q = r;
}

int main(void) {
    int x = 5, y = 3;
    cout << "x=" << x
        << " y=" << y << endl;
    exchange(x, y);    // now x = 3, y = 5
    cout << "x=" << x
        << " y=" << y << endl;
    return 0;
}
```

   (a) What does the program output? [4]

   (b) Change just one line of the program to make it work as intended. [2]

   (c) Give a working version of `exchange` that has no more than three statements and does not use any temporary variables. [4]

5. Consider the following C program:

```
#include <stdio.h>

int main(void) {
    unsigned x;
    for (x = 5; x >= 0; x--)
        printf("%d\n", x);
    return 0;
}
```

   (a) Compile and run the above program. What does it output? [4]

   (b) Why does that happen? [4]

   (c) Change just one line of the program to make it work as intended. [2]