

Name: _____

CS 60 – Introduction to C, C++, and Unix Optional Homework

Due: Friday 9am, June 5, 2009

(Questions are 2 points each)

1. If the Unix command “**pwd**” returns `/usr/src/cs60/projects/proj3`, give the command to delete all the files and directories (and any directory contents) in the `/usr/src/cs60/hws/hw4` directory. Do not change your working directory, and do not use the full pathname (i.e., use a path relative to your current directory).
2. Put these in chronological order in a typical compilation process, from first to last: { *preprocessor, object code, source code, executable code, assembler, linker, compiler, assembly code* }.
3. What specifically does the Unix command “**chmod 644 file**” accomplish?
4. You suspect that you have an out-of-control Unix process running. (a) What Unix command do you issue to find out the process ID? (b) If the process ID is 5267, what Unix command do you issue to kill the process?

5. What will be the value of **x** after this code is executed?

```
#define OP(x,y) x * y
int x = OP(3+4,4+5);
```

6. What will this C code segment print out:

```
int x = 18;
printf("The answer is %05x\n", x);
```

7. Fix the problem(s) in this C code segment to input integer values:

```
int x, y;
printf("Input (x, y) values:");
scanf("%d%d", x, y);
```

8. What is the value of **num** after this C code is executed:

```
int num = 8;
int arr[] = {1, 2, 3, 4, 5, 6, 7};
int *parr = arr;
parr += 2;
num *= *parr;
```

9. What is the value of **x** after this C code is executed:

```
int x = (3 < 5) << 2
```

10. What is the value of **b** after this C code is executed:

```
int b = 2^8;
```

11. What value does this C program return:

```
int main(void)
{
    int i=1;
    {
        int i;
        i = 2;
        i++;
    }
    if (i > 2) return (i);
    else return (0);
}
```

12. What is the value of **a** after this C code is executed:

```
unsigned char a = 0;
a = ~a;
a <<= 4;
a = ~a;
a &= 0xfe;
```

13. What is the value of **val** after this C code is executed?

```
int val, num = 0 ;
switch (++num) {
    case 0 : val = 123;
    case 1 : val = 456;
    case 2 : val = 789;
    default : break;
};
```

14. This C code is intended to initialize an array of values. Correct any errors (or state that there are none):

```
int i, j, arr[5][8];
for (i=1; i<5; i++)
    for (j=1; j<8; j++)
        arr[i, j] = 0
```

15. If the integer **x** is assigned the value **0x2468**, on a “Little-endian” system (such as the CSIL machines), show the values of the four bytes (hexadecimal values) in order from lowest memory address to highest memory address.

16. What is the value of **x** after this C code is executed:

```
int *ptr = 0x0;
char *ptrc = 0x0;
ptr++;
ptrc++;
int x = (int)ptr + (int)ptrc;
```

17. What is the value of **x[0]** after this C code is executed:

```
int i, x[] = {0,1,2,3,4,5};
int *px = &x[0];

for (i=0; i<4; i++)
    *px++ = 100+i;
*px = i;
```

18. What is the value of the `argc` argument to `main` when the program is called with this command-line input:

```
$ prog -v 1.0 0.0 -g file.dat
```

19. In the previous problem, what is the value of `argv[2]`?

20. What is the printed output when executing this C++ code inside of `main()`:

```
class Base
{
public:
    Base() { cout << "Base\n"; }
    void bar() { cout << "Base::bar()\n"; }
    virtual void foo() { cout << "Base::foo()\n"; }
};
class Derived : public Base
{
public:
    Derived() { cout << "Derived\n"; }
    void bar() { cout << "Derived::bar()\n"; }
    void foo() { cout << "Derived::foo()\n"; }
};
Derived d;
Base &b1 = d;
Base b2 = d;
b1.bar();
b1.foo();
b2.bar();
b2.foo();
```