Bitwise Operations (1B)

a1.c

```
#include <stdio.h>
#define N 1000000


int main(void) {

  printf("1<<0 = %d 0x%02x (2^0)\n", 1<<0, 1<<0);
  printf("1<<1 = %d 0x%02x (2^1)\n", 1<<1, 1<<1);
  printf("1<<2 = %d 0x%02x (2^2)\n", 1<<2, 1<<2);
  printf("1<<3 = %d 0x%02x (2^3)\n", 1<<3, 1<<3);
  printf("1<<4 = %d 0x%02x (2^4)\n", 1<<4, 1<<4);


  printf("123<<0 = %d 0x%02x\n", 123<<0, 123<<0);
  printf("123<<1 = %d 0x%02x\n", 123<<1, 123<<1);
  printf("123<<2 = %d 0x%02x\n", 123<<2, 123<<2);
  printf("123<<3 = %d 0x%02x\n", 123<<3, 123<<3);
  printf("123<<4 = %d 0x%02x\n", 123<<4, 123<<4);

  printf("123>>0 = %d 0x%02x\n", 123>>0, 123>>0);
  printf("123>>1 = %d 0x%02x\n", 123>>1, 123>>1);
  printf("123>>2 = %d 0x%02x\n", 123>>2, 123>>2);
  printf("123>>3 = %d 0x%02x\n", 123>>3, 123>>3);
  printf("123>>4 = %d 0x%02x\n", 123>>4, 123>>4);

}
```

a2.c

```
#include <stdio.h>
#define N 1000000


int main(void) {

  int i = 0xF1F2F3F4;
  int j = 0xFFFF0000;

  printf("i= 0x%08x %d \n", i, i);
  printf("j= 0x%08x %d \n", j, j);
  printf("^  0x%08x \n", i ^ j);
  printf("|  0x%08x \n", i | j);
  printf("&  0x%08x \n", i & j);

}
```

a3.c

```
#include <stdio.h>

int main(void) {
  int i;

  printf("%hd\n", 42000);


  printf("%d\n", 1 << 1);
  printf("%d\n", 1 << 2);
  printf("%d\n", 1 << 3);
  printf("%d\n", 1 << 4);
  printf("%d\n", 1 << 5);
  printf("%d\n", 1 << 6);
  printf("%d\n", 1 << 7);
  printf("%d\n", 1 << 8);
  printf("%d\n", 1 << 9);
  printf("%d\n", 1 << 10);

  // pow(2, i) --> <math.h> --> gcc t.c -lm

  for (i=0; i<33; ++i) {
     printf("2^%d = ", i);
     printf("(1 << %d) = ", i);
     printf("%d \n", 1 << i);
  }

  for (i=0; i<33; ++i) {
     printf("2^%d = ", i);
     printf("(1L << %d) = ", i);
     printf("%ld \n", 1L << i);
  }


}
```