```
#include <stdio.h>
void swap(int *p, int *q) {
        int temp;
        temp = *p;
        *p = *q;
        *q = temp;
}

void main(int argc, char *argv[]) {
        int a = 101;
        int b = -2;
        int *pa;
        int *pb;
        int *ptemp;

1       printf("\nThis is the output from %s:\n\n", argv[0]);

        printf("To begin, a is %d, b is %d\n", a, b);
        swap(&a, &b);
        printf("After swap(&a, &b), a is %d, b is %d\n", a, b);

        pa = &a;
        pb = &b;

2       printf("\nNow pa points to an object with value %d,"
2           "\nand pb points to an object with value %d\n", *pa, *pb);
        swap(pa, pb);
3       printf("After swap(pa, pb), a is %d, b is %d\n", a, b);
        printf("And pa points to an object with value %d,"
            "\nand pb points to an object with value %d\n", *pa, *pb);

        ptemp = pa;
        pa = pb;
        pb = ptemp;
4       printf("\nAfter swaping pa and pb,\npa points to an object with value %d,"
            "\nand pb points to an object with value %d\n", *pa, *pb);
        printf("But a is %d, b is %d\n", a, b);
}



This is the output from pointers-2:

a is 101, &a is effffcdc
pa is effffcdc, &pa is effffcd8
7   ppa is effffcd8, &ppa is effffcd4
8   All these are the same: a 101, *pa 101, **ppa 101
```

```
1       This is the output from pointers-1:

        To begin, a is 101, b is -2
        After swap(&a, &b), a is -2, b is 101

2       Now pa points to an object with value -2,
2       and pb points to an object with value 101
3       After swap(pa, pb), a is 101, b is -2
        And pa points to an object with value 101,
        and pb points to an object with value -2

4       After swaping pa and pb,
        pa points to an object with value -2,
        and pb points to an object with value 101
        But a is 101, b is -2
```

```
        #include <stdio.h>
        void main(int argc, char *argv[]) {
              int a = 101;      /* a is an int */
5             int *pa;          /* pa is a pointer to an int */
6             int **ppa;        /* ppa is a pointer to a pointer to an int */

              printf("\nThis is the output from %s:\n\n", argv[0]);

              printf("a is %d, &a is %x\n", a, (int) &a);
7             pa = &a;
              printf("pa is %x, &pa is %x\n", (int) pa, (int) &pa);
8             ppa = &pa;
              printf("ppa is %x, &ppa is %x\n", (int) ppa, (int) &ppa);

              /* At this point we have created a pointer chain:
                    ppa -> pa -> a
              * /

              printf("All these are the same: a %d, *pa %d, **ppa %d\n",
              a, *pa, **ppa);
        }
```