CSE 333 Section 2 Exercise

June 29, 2017

Question 1 Consider the following C program.

```
#include <stdio.h>

void g(int *x, int *y) {
 *x = *y + 1;
 *y = *y + 2;
 printf("g: *x = %d, *y = %d\n", *x, *y);
}

void f(int *p, int *q) {
 int n = 17;
 g(q, &n);
 printf("f: *p = %d, *q = %d, n = %d\n", *p, *q, n);
}

int main(int argc, char** argv) {
 int i = 42;
 int j = 10;
 int n = 374;
 f(&i, &j);
 printf("main 1: i = %d, j = %d, n = %d\n", i, j, n);
 g(&n, &n);
 printf("main 2: i = %d, j = %d, n = %d\n", i, j, n);
 return 0;
}
```

What output does this program produce when it is executed? (It does execute successfully.) Draw diagrams showing memory to help answer the question.

Question 2 Another traditional, annoying C program. As is usual, this program compiles and executes without warnings or errors.

```
#include <stdio.h>

void foo(int *a, int *b, int *c) {
  b[2] = -2;
  b[1] = a[0] + *c;
  *a = 15;
  printf("foo: *a = %d, *b = %d, *c = %d\n", *a, *b, *c);
}

int main() {
  int x = 42;
  int y[3];
  y[0] = 1;
  y[1] = 2;
  y[2] = 3;
  int * p = &y[1];
  p[1] = 17;

  printf("x = %d, *p = %d\n", x, *p);
  printf("y = {%d, %d, %d}\n", y[0], y[1], y[2]);

  foo(&x, y, p);

  printf("x = %d, *p = %d\n", x, *p);
  printf("y = {%d, %d, %d}\n", y[0], y[1], y[2]);
  return 0;
}
```

Fill in the lines below to show the output produced when this program is executed. You should draw diagrams showing variables and pointers to help answer the question and to help us award partial credit if needed. Output:

```
x = __________, *p = __________

y = { _________, ________, _________ }

foo: *a = _________, *b = _________, *c = _________

x = __________, *p = __________

y = { _________, _________, _________ }
```

(extra space provided on the next page for diagrams or scratch work)