CS314 Spring 2014

Assignment 4

Due Friday, February 28, **before** class

1 Problem — Pointers

Given the following correct program in C,

1. give the correct type definitions for pointer variables `ra, rb, rc, rra, rrb, and rrc`.

2. draw a picture that shows all of the variables and their contents similar to the picture as shown in lecture 9, page 11 and 12. Your picture should show the variables and their values just before the first print statement (*).

3. show the output from this program.

4. write a statement involving a pointer expression using the variables in this program which is ILLEGAL given your declared types.

```
main() {int a, b, c;
        ??? ra; ??? rb; ??? rc; ??? rra; ??? rrb; ??? rrc;
        a = 3; b = 2; c = 1;
        ra = &a;
        rb = &b;
        rc = &c;
        ra = rb;
        rra = &rb;
        rc = *rra;
        rrc = rra;
        rc = &a;
        rrb = &rc;
        rb = &c;
        *ra = 4;
        *rb = *ra + 7;
        /* (*) */
printf ("%d %d %d\n",a,b,c);
printf("%d %d\n",*ra,*rb);
printf("%d %d %d\n",**rra,**rrb,**rrc);
}
```

2 Problem — Freeing Memory

Here is a code fragment from our singly-linked list example from class.

```
/* DEALLOCATE LIST */
for (current_cell = head;
     current_cell != NULL;
     current_cell = current_cell->next)
  free(current_cell);
```

How can you rewrite this code to make it safe? You can introduce new variables, if needed.