1. We want to add an inventory system to a text adventure game so that the player can collect items. First, we’ll implement a bag data structure that holds items in a linked list. Each item_t has an associated weight, and each bag_t has a max_weight that determines its holding capacity (see the definitions below). In the left text area for item_node_t, define the necessary data type to serve as the nodes in a linked list of items, and in the right text area, add any necessary fields to the bag_t definition.

```c
typedef struct item {
    int weight;
    // other fields not shown
} item_t;

typedef struct bag {
    int max_weight;
    int current_weight;
    // add other fields necessary
    // (b) FILL IN HERE
} bag_t;
```

(a) Complete the add_item() function, which should add item into bag only if adding the item would not cause the weight of the bag contents to exceed the bag’s max_weight. The function should return 0 if the item could not be added, or 1 if it succeeded. Be sure to update the bag’s current_weight. You do not need to check if malloc() returns NULL. Insert the new item into the list wherever you wish.

```c
int add_item(item_t *item, bag_t *bag) {
    if (__________________________________________________________ ) {
        return 0;
    }
    item_node_t *new_node = _______________________________________
    // Add more code below...

    return 1;
}
```

(d) Finally, we want an empty_bag() function that frees the bag’s linked list but NOT the memory of the items themselves and NOT the bag itself. The bag should then be “reset”, ready for add_item. Assume that the operating system immediately fills any freed memory with garbage. Fill in the functions below.
(e) Now suppose that we care about the order of items in our bag. However, because we’re clumsy, the only possible way for us to rearrange items is to reverse their order in the list.

```c
void reverse_list(bag_t *bag) {
    // FILL IN HERE
}
```
Bonu**: You have five jars of pills. All the pills in one jar only are "contaminated." The only way to tell which pills are contaminated is by weight. A regular pill weighs 10 grams; a contaminated pill is 9 grams. You are given a scale and allowed to make just one measurement with it. How do you tell which jar is contaminated?