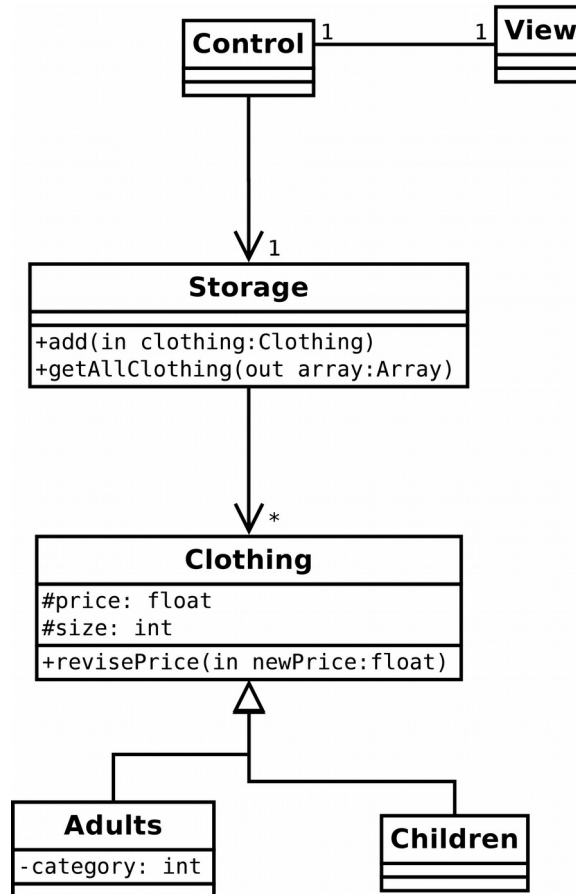# COMP 2404
Midterm Exam Solution (version 3)

1. [2 marks] c
2. [2 marks] a
3. [2 marks] b
4. [2 marks] a

5. [20 marks]

Classes: 6 marks (1 mark each)
Control-Storage: 2 marks (1 directionality, 1 multiplicity)
Control-View: 4 marks (1 each directionality, 1 each multiplicity)
Storage: 2 marks (add function with correct parameter)
Storage-Clothing: 2 marks (1 directionality, 1 multiplicity)
Clothing: 2 marks (1 attributes, 1 function with correct parameters)
Clothing-Adult-Childrens: 2 marks (1 association, 1 attribute)

6.
  a. [10 marks]

```
// 2 marks for checking for full array
  if (size == MAX)
    return;

// 4 marks for shifting elements to the back
// -- 2 marks for loop with correct header
// -- 2 marks for moving each element toward the back
  for (int i=size-1; i>=0; --i)
    elements[i+1] = elements[i];

// 2 marks for correct insertion of new element
  elements[0] = racer;

// 2 marks for increasing size
  ++size;
```

  b. [12 marks]

```
    Runner* goner;
    Node*   newHead;

// 2 marks for dealing with empty list
  if (head == 0)
    return 0;

// 1 mark for saving first element as return value
  goner   = head->data;
// 2 marks for saving next head
  newHead = head->next;
// 2 marks for deallocating head node
  delete head;
// 2 marks for setting new head
  head    = newHead;
// 2 marks for setting new head's prev to null
  newHead->prev = 0;
// 1 mark for returning former head's data
  return goner;
```