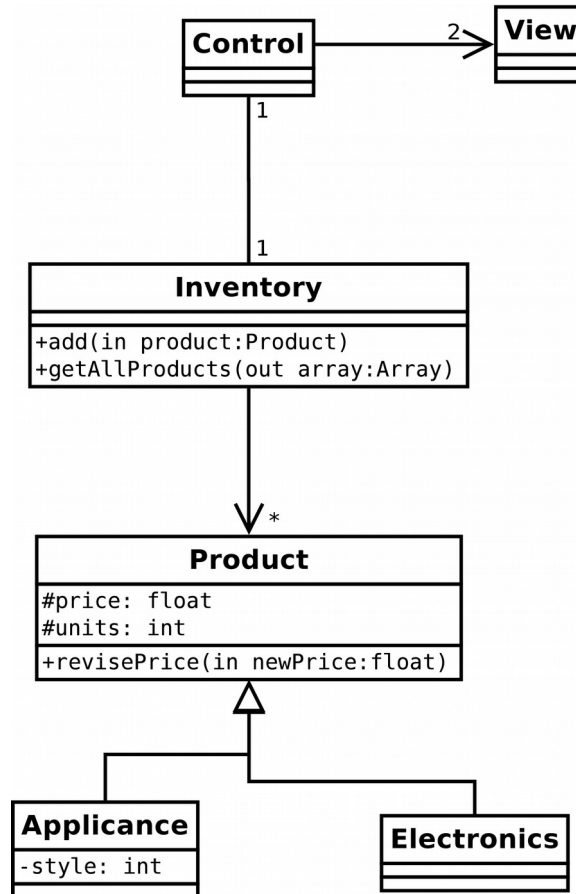


COMP 2404

Midterm Exam Solution (version 4)

1. [2 marks] b
2. [2 marks] a
3. [2 marks] a
4. [2 marks] b
5. [20 marks]



Classes:	6 marks (1 mark each)
Control-View:	2 marks (1 directionality, 1 multiplicity)
Control-Inventory:	4 marks (1 each directionality, 1 each multiplicity)
Inventory:	2 marks (add function with correct parameter)
Inventory-Product:	2 marks (1 directionality, 1 multiplicity)
Product:	2 marks (1 attributes, 1 function with correct parameters)
Product-Appl-Electr:	2 marks (1 association, 1 attribute)

6.

a. [10 marks]

```
    Runner* goner;
// 2 marks for dealing with empty array
    if (size == 0)
        return 0;
// 1 mark for saving first element for return value
    goner = elements[0];

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

// 2 marks for decreasing size
    --size;
// 1 mark for returning former first element
    return goner;
```

b. [12 marks]

```
    Node *newNode, *currNode, *prevNode;

// 4 marks for creating and initializing new node
    newNode = new Node;  newNode->data = racer;
    newNode->prev = 0;    newNode->next = 0;

// 2 marks for finding end of list
    prevNode = 0;  currNode = head;
    while (currNode != 0) {
        prevNode = currNode;  currNode = currNode->next;
    }

// 2 marks for dealing with empty list
    if (prevNode == 0) head = newNode;
// 2 marks for dealing with inserting in middle/end position
    else prevNode->next = newNode;

// 2 marks for linking back to rest of list
    newNode->prev = prevNode;
```