

# Computing Assessed Programming Tutorial 3

Susan Eisenbach

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to be done in Kenya or Java

1. What does the following program print out?

```
class Pair{
    int first;
    int sec;
}
void main(){
    Pair a;
    a.first = 1;
    a.sec = 2;
    Pair b = a;
    Pair c = a;
    b.first = b.first + 1;
    c.first = a.first - 1;
    println(b.first);
    println(c.first);
}
```

2. Write a program that reads a list of positive numbers and displays the largest number in the list followed by the number of times it appears. The list should be terminated by 0. There is no 0 in the list and there is at least one number before the 0. Do not use an array or non-main method to answer this question. Write your code so that given the same input it would produce the same output as the following example execution:

```
Please type in your numbers -->1 2 3 2 4 5 6 6 0
the largest number is 6 and it appears 2 times
```

3. All characters in Java have numeric values (called ASCII values). The numeric value for 'A' is 65, 'B' is 66 etc. and 'a' is 97, 'b' is 98 etc. The following method is legal Java and returns 0

```
int meth(){
    char c = 'a'; return c - 97;
}
```

- a. Write a method convert that takes a character and returns an integer. If the character is a letter then it returns its position in the letters. So `convert('A')` returns 1 and `convert('z')` returns 26. If the character is not a letter then `convert` should return -1.
- b. Write a program that reads in a passage of text terminated by EOF and prints out the number of times each letter occurs. The passage should ignore anything that is not a letter. It should treat upper and lower case letters as the same letter. You may call `convert` from part a of this question. Write your code so that given the same input it would produce the same output as the following example execution:

```
Please type in your text -->Hello sweetie
0 0 0 0 4 0 0 1 1 0 0 2 0 0 1 0 0 0 1 1 0 0 1 0 0 0
```

Answers:

1)

1

1

2)

```
void main(){
    int n; int largest; int count = 0;
    print("Please type in your numbers -->");
    n = readInt(); largest = n;
    assert (n>0):"enter a positive number only";
    while (n>0){
        if (n>largest) {largest = n; count = 1;}
        else {if (n == largest){count = count + 1;}}
        n = readInt();
        assert (n>=0):"enter a positive number only";
    }
    println ("the largest number is " + largest + " and it appears " + count + "
times");
}
```

3a)

```
int convert(char c){
    if ('a' <= c && c <= 'z') {return c-96;}
    else if ('A' <= c && c <= 'Z') {return c-64;}
    else{ return -1;} //for unimportant characters
}
```

3b)

```
void main(){
    int[] letters = new int[27];
    int i;
    char c = ' ';
    print("Please type in your text -->");
    while( ! isEOF() ) {
        c = readChar();
        i = convert(c);
        if (0 < i && i <= 26) {
            letters[i] = letters[i] + 1;
        }
    }
    for (i=1; i <= 26; i++){
        print(letters[i]+" ");
    }
}
```