

CS101 – Computer Programming

Quiz for Tuesday Batch – 14 October 2014

Q1. Consider the following code snippet and choose the correct options from the following statements which describe the state of the variables at the end of line 9:

```
1: int *x, *y, *z;
2: int a, b;
3: cin >> a >> b;
4: x = &a;
5: y = x;
6: z = &b;
7: *x = *x + *y + *z + 1;
8: x = z;
9: *z = *x + *y + 1;
```

- A. The value of 'b' is even
- B. The value of '*z' is odd
- C. Pointers 'x', 'y' and 'z' point to the same memory location
- D. There is no pointer among 'x','y' and 'z' that points to memory location 'a'
- E. None of these

Q2. In this question, we want to write a function 'myFunc' that takes as input parameter a string (a character array), and returns a pointer to another character array (or string). The function expects the input parameter string to consist of only lower case letters (i.e. characters from 'a' to 'z'). The returned string should contain two copies of the input string -- one with all lower case letters (as in the input parameter), followed by a copy of the same string with all lower case letters converted to upper case letters.

For example, if the string passed as input parameter is "moon", the returned string should be "moonMOON".

```
char * myFunc(char src[]){
    for (int i = 0; i < strlen(src); i++) {
        if ((src[i] < 'a') || (src[i] > 'z')) {
            cout << "Bad input!!!" << endl;
            return NULL;
        }
    }
    char * result = new char( Expr1 + 1);
    // additional one char allocated for the end of string character '\0'
    if (result == NULL) {
        cout << "Memory allocation failure." << endl;
        return NULL;
    }
    strcpy(result, src);
    int i, j;
    int delta = 'A' - 'a';
    for(i = 0, j = Expr2; i < Expr3; i++) {
        result[j++] = src[i] + delta;
    }
    result[j] = '\0'; // insert the final '\0'
    return result;
}
```

The above code fragment has three unspecified expressions named 'Expr1', 'Expr2' and 'Expr3'. Which of the following choices of these expressions will make the function 'myFunc' behave as expected (described above)? Assume that we have included the following pre-processor directives in our program.

```
#include <iostream>
#include <cstring>
using namespace std;
```

- A. Expr1: 2*strlen(src), Expr2: strlen(result), Expr3: strlen(src)
- B. Expr1: 2*strlen(src), Expr2: strlen(src), Expr3: strlen(src)
- C. Expr1: strlen(src), Expr2: 2*strlen(result), Expr3: 2*strlen(src)
- D. Expr1: strlen(src), Expr2: 2*strlen(src), Expr3: strlen(src)
- E. None of these