Data Structure and Algorithm

Quiz #1

Tuesday, February 26, 2013

Remember to write down **your name**!

Problem 1. Please write down the output for each `printf()`.

Note that the code may fail to be compiled or the execution may not happen in an expected way. In these cases, you should explain why you think it will not work.

1.

```
1  int *a, *b;
2  int* c, d;
3  a = 1; b = 1; c = 1; d = 1;
4  printf("%d\n", a+b);
5  printf("%d\n", c+d);
```

2.

```
1  char ary[] = "DSA is so fun.";       //strlen(ary) is 14
2  char *ptrChar = ary;
3  int *ptrInt = (int*) ary;
4  printf("%d\n", sizeof(ary));
5  printf("%s %s\n", ptrChar+1, ptrInt+1);
6  *ptrChar++;
7  printf("%c %s\n", *ptrChar, ary);
```

3.

```
1  int *square(int n){
2      int result = n * n;
3      return &result;
4  }
5  int main(){
6      int *ptr = square(10);
7      printf("%d\n", *ptr);
8  }
```

Problem 2.   The following is part of a C program.

```
1  int n = 10;
2  int A[n];
3  int *B = (int*) malloc( sizeof(int) * n );
```

1. The sizes of array A and array B are the same. Please describe the difference between them.

   The program may crash when n becomes very large. Why?

   (Hint: focus on array A.)

2. How to use `malloc()` to declare a $n \times m$ array C? Please write down the C code.

   (Hint: you can use a **for loop** and int**.)