Quiz 1 Practice Questions

1. Suppose that myprog is a C++ program. If you invoke myprog from the shell using the command-line below, what would be the contents of the argv parameter in myprog’s main function?

$ myprog "This is" 'your life'

a. 

```
    ➔ myprog
    ➔ "This
    ➔ is"
    ➔ 'your
    ➔ life'
```

b. 

```
    ➔ myprog
    ➔ This
    ➔ is
    ➔ your
    ➔ life
```

c. 

```
    ➔ myprog
    ➔ "This
    ➔ is"
    ➔ your life
```

d. 

```
    ➔ myprog
    ➔ This is
    ➔ your life
```
2. The CopyString function below returns a copy of the C string that is passed to it. Notice that the expression that computes the size of the dynamically allocated array for the new string is missing. Which of the following expressions would correctly calculate the size of the dynamically allocated array?

```c
char * CopyString(const char * str) {
    char * copy = new char[??????];
    strcpy(copy, str);
    return copy;
}
```

a. `sizeof(str)`
b. `strlen(str)`
c. `sizeof(str) + 1`
d. `strlen(str) + 1`
e. `sizeof(str + 1)`
f. `strlen(str + 1)`

3. Suppose that a function uses the following code to call the CopyString function defined in the previous question:

```c
char * str = CopyString("Brigham Young University");
```

Which of the following C++ statements would correctly deallocate the memory occupied by the string returned by CopyString?

a. `delete str;`
b. `free str;`
c. `delete [] str;`
d. `free [] str;`
e. `delete str [];`
f. `free str [];`

The next 7 questions refer to the following C++ declarations:

```c
struct Point { long x; long y; };
Point points[] = {[0,0],[1,1],[2,2],[3,3],[4,4],[5,5]};
```

You may make the following assumptions about these declarations:
- `a long` is 4-bytes
- the compiler uses the minimum possible number of bytes to store a `Point` structure
- the `points` array is stored at memory address 1000 (decimal)
4. What is the value of the following expression?

\[
\text{sizeof(points)}
\]

a. 24
\[\star\] b. 48
  c. 64
d. 96

5. What is the value of the following expression?

\[
\text{sizeof(points)} / \text{sizeof(points[0])}
\]

a. 1
  b. 4
\[\star\] c. 6
d. 12

6. What is the value of the following expression?

\[
\text{points}
\]

\[\star\] a. 1000
  b. \{0,0\}
  c. \{{0,0},{1,1},{2,2},{3,3},{4,4},{5,5}\}
d. the expression is invalid

7. What is the value of the following expression?

\[
&\text{points[5]};
\]

\[\star\] a. 1040
  b. 1005
c. \{4,4\}
d. \{5,5\}
e. the expression is invalid
8. What is the value of the following expression?

\[(points + 2)\]

a. 1002  
b. 1008  
\* c. 1016  
d. 1032  
e. the expression is invalid

9. What is the value of the following expression?

\[\&points[5] - \&points[2]\]

\* a. 3  
b. 12  
c. 24  
d. 48  
e. the expression is invalid

10. What is the value of the following expression?

\[\&*(\&points[4])\]

a. 1004  
b. 1016  
c. 1032  
d. 1064  
\* e. \{4,4\}  
f. the expression is invalid
The next 4 questions refer to the following C++ program:

```cpp
struct Point { long x; long y; };
const int SIZE = 5;

Point A(Point p[SIZE]) {
    for (int i = 0; i < SIZE; ++i) {
        p[i].x = i;
        p[i].y = i;
    }
    return p[2];
}

Point B(Point p[], int n) {
    Point tmp = p[2];
    for (int i = 0; i < n; ++i) {
        p[i].x *= 2;
        p[i].y *= 2;
    }
    return tmp;
}

Point C(Point * p, int n) {
    Point * tmp = &p[2];
    Point * end = (p + n);
    while (p < end) {
        p->x *= 2;
        p->y *= 2;
        ++p;
    }
    return *tmp;
}

void D(Point & p) {
    p.x /= 2;
    p.y /= 2;
}

int main() {
    Point points[SIZE] = {{0,0},{0,0},{0,0},{0,0},{0,0}};
    Point a = A(points);
    Point b = B(points, SIZE);
    Point c = C(points, SIZE);
    D(points[2]);
    return 0;
}
```
11. What is the value of the variable $a$ just before `main` returns?
   a. \{0, 0\}
   b. \{1, 1\}
   c. \{2, 2\}
   d. \{3, 3\}

12. What is the value of the variable $b$ just before `main` returns?
   a. \{0, 0\}
   b. \{1, 1\}
   c. \{2, 2\}
   d. \{4, 4\}

13. What is the value of the variable $c$ just before `main` returns?
   a. \{0, 0\}
   b. \{2, 2\}
   c. \{4, 4\}
   d. \{8, 8\}

14. What is the value of the variable `points[2]` just before `main` returns?
   a. \{0, 0\}
   b. \{4, 4\}
   c. \{8, 8\}
   d. \{16, 16\}