C++ Exercises

COMP3220 – Principle of Programming Languages

2016 Spring

1 Does It Compile?

In this section, we review the basic C++11 syntax. Select the one that generates a compile error.

1. (a) `int a;` (b) `int a3;` (c) `int a_3;` (d) `int 3a;`
2. (a) `int mon-said-it-is-an-ugly-name;` (b) `int monSaidItIsAnUglyName;` (c) `int mon_said_it_is_an_ugly_name;` (d) `int monsaiditisanuglyname;`
3. (a) `char a{127};` (b) `char a = 3;` (c) `char a{'a'};` (d) `char a{128};`
4. Suppose we have declaration `int a = 0`.

   (a) `++a = 3;` (b) `a++ = 3;` (c) `a = a + 3;` (d) `-a;`
5. (a) `int a[]{1, 2};` (b) `int a[3] = {1,2};` (c) `int a[2][]{1,2,3,4};` (d) `int a[][2]{1,2,3,4};`

2 Run the Code (with your mind)

Write down the output of the following code. I omit the necessary header files and `main()` function for brevity.

1.
```
char str[]{"Hello\0World!\n"};
cout << str << endl;
```

2.
```
int a = 3;
int* b = &a;
int& c = a;
printf("%d %d %d\n", a, *b, c);
(*b) = 4;
printf("%d %d %d\n", a, *b, c);
c = 40;
printf("%d %d %d\n", a, *b, c);
```

3.
```
int a = 0;
if (a = 3)
  cout << "foo" << endl;
else
  cout << "bar" << endl;
```

4.
```
int a = 0, b{3};
switch(a) {
  case 0: --b;
  case 1: ++b; break;
  case 2: b *= 3;
  default: b -= 4;
}
cout << b << endl;
```

5.
```
int end = 4;
for (int i = 0; i < end; ++i) {
  --end;
  cout << end << endl;
}
```

6.
```
string s{"12345678"};
cout << s.substr(1, 3) << endl;
s.replace(0, 1, "abcd");
cout << s << endl;
cout << s + "hello" << endl;
cout << s.c_str() << endl;
```

7.
```
int i;
while (cin >> i) {
```

```
  cout << i << endl;
}
```

8.
```
#define str(x) #x
#define glue(a,b) a ## b

glue(c,out) << str(Hello\nWor
                   ld!) << endl;
```

3 Show Me Your Code

1. Please write a short C++ program to investigate how the floating numbers are stored in memory. *hint: we used the* `union` *to discuss how integer is stored.*

2. Finish the `Complex` class