Object Oriented Programming (Quiz Week 3,4)

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Name and Seat No._____

Question 1. Run classes from Q2-Q8 and must Tabulate Error Dictionary for Quiz as per given format. Do it on separate sheet.

Class /Object Name	Concept Name	Line Number and Error description	Correct / Modified Line which resolve issue/error

Pass by what?

Question NO. 2.
(a) (b) (c)

Consider the following code block:

```
1  public class Pokemon {
2      public String name;
3      public int level;
4
5      public Pokemon(String name, int level) {
6          this.name = name;
7          this.level = level;
8      }
9
10     public static void main(String[] args) {
11         Pokemon p = new Pokemon("Pikachu", 17);
12         int level = 100;
13         change(p, level);
14         System.out.println("Name: " + p.name + ", Level: " + p.level);
15     }
16
17     public static void change(Pokemon poke, int level) {
18         poke.level = level;
19         level = 50;
20         poke = new Pokemon("Gengar", 1);
21     }
22 }
```

a) What will be printed out by the code above?

b) Draw a box and pointer diagram to illustrate what happened. (Memory Map)

c) On line 19, we set `level` equal to `50`. What level do we mean? An instance variable of the `Pokemon` class? The local variable containing the parameter to the `change` method? The local variable in the `main` method? Or something else?

Question NO. 3. Match the candidate blocks of code with their matching command-line output.

```
class A {
  int ivar = 7;
  void m1() {
    System.out.print("A's m1, ");
  }
  void m2() {
    System.out.print("A's m2, ");
  }
  void m3() {
    System.out.print("A's m3, ");
  }
}

class B extends A {
  void  m1() {
    System.out.print("B's m1, ");
  }
}
```

```
class C extends B {
  void m3() {
    System.out.print("C's m3, "+(ivar + 6));
  }
}

public class Mixed2 {
  public static void main(String [] args) {
    A a = new A();
    B b = new B();
    C c = new C();
    A a2 = new C();
    [                ]   <-- candidate code goes here (three lines)
  }
}
```

code candidates:

```
b.m1();
c.m2();
a.m3();
```

```
c.m1();
c.m2();
c.m3();
```

```
a.m1();
b.m2();
c.m3();
```

```
a2.m1();
a2.m2();
a2.m3();
```

output:

```
A's m1, A's m2, C's m3, 6

B's m1, A's m2, A's m3,

A's m1, B's m2, A's m3,

B's m1, A's m2, C's m3, 13

B's m1, C's m2, A's m3,

B's m1, A's m2, C's m3, 6

A's m1, A's m2, C's m3, 13
```

Question NO. 4.

Convert JAVA code in Question NO. 3 into C++ Code. Maintain error dictionary and try to resolve errors.

Question NO. 5.

```
class Rational
{
public:
    Rational();
    Rational(int numer, int denom);

    int getNumerator() const;
    int getDenominator() const;

friend void display(ostream& out,  const Rational& value);

friend bool operator <(const Rational& left,
                       const Rational& right);

private:
    int numerator;
    int denominator;
};
```

If you want to be able to compile the following main.cpp code,

```
Rational r1;
int x;
cout << r1 + x << endl;
```

Which overloaded operator(s) do you need?

a) friend Rational operator+(const Rational& left, int right);

b) friend void operator+ (const Rational& left, int right);

c) friend ostream operator << (ostream& out, const Rational& object);

d) friend ostream& operator << (ostream& out, const Rational& object);

e) A and C

f) A and D

Question NO. 6. What must we add to the Rational class or to the program in order for the following code to compile?

Code	Options
Rational myRational(2,3); int a; if (a < myRational){ … }	**a)** We need another overloaded < operator that expects an integer as its second parameter. **b)** We need another overloaded < operator that expects an integer as its first parameter. **c)** We need a Rational constructor that expects a rational number **d)** We need a Rational constructor that expects a single integer **e)** A or D **f)** B or D

Question NO. 7.

The code should mimic following situation:

Scenario: A BSCS student enrolls in total six courses per semester.

Appropriately code class Student so that class and main() function compiled and execute successful in C++.

Note: you need to best complete code by using hints in Question No. 5. Provide necessary attributes, argument list, operator overloading of <<,= and write destructor

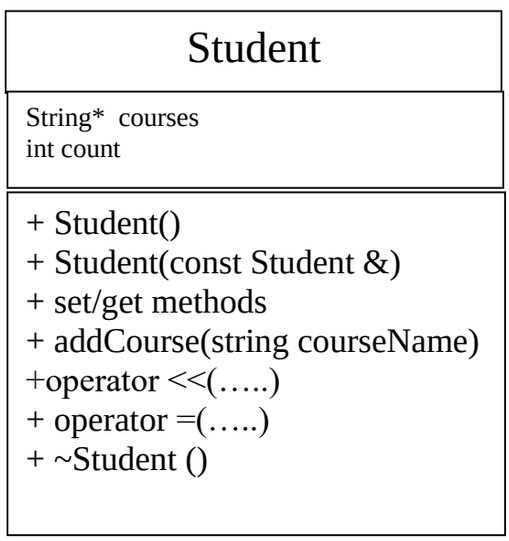
Code for Question NO. 7.

```
main()
{
      Student  Salman;
      Student Akbar(Salman);

      Salman.addCourse("BSCS 413");
      cout<< Akbar.getCourse(0);

      Akbar = Salman;

      cout<< Akbar;
      cout  << Salman;
}// end main
```



Question NO. 8. class nPOINT.h

Complete the given C++ class declaration. It is developed to represent a point with arbitrary number of components (instead of only two x,y as we discussed in course) specified in the static member **length**.

Q8.(a) First draw UML representation of class nPOINT using given skeleton code.

Q8.(b) complete functions body and make the code successfully run on your PCs.

Q8 (c) Write main.cpp showing calling and successful execution of class nPOINT.

```
class nPOINT {
private:
    static int length;
    int* p;
public:
    nPOINT();
    ~nPOINT();
    void Set(int index, int val)
     {
         p[index] = val;
     }
```

```
int Get(int index) const
     {return    p[index];   }

static int Length()
          { return length;}
};
int nPOINT::length=4;
```

Provide main.cpp show complete and successful execution of class nPoint

main.cpp