CMP-142 Object Oriented Programming
BS Fall 2014
Quiz 03

RollNo:

Issue Date: 27-Mar-2015
Time: 40 min
Marks: 15

Objective:

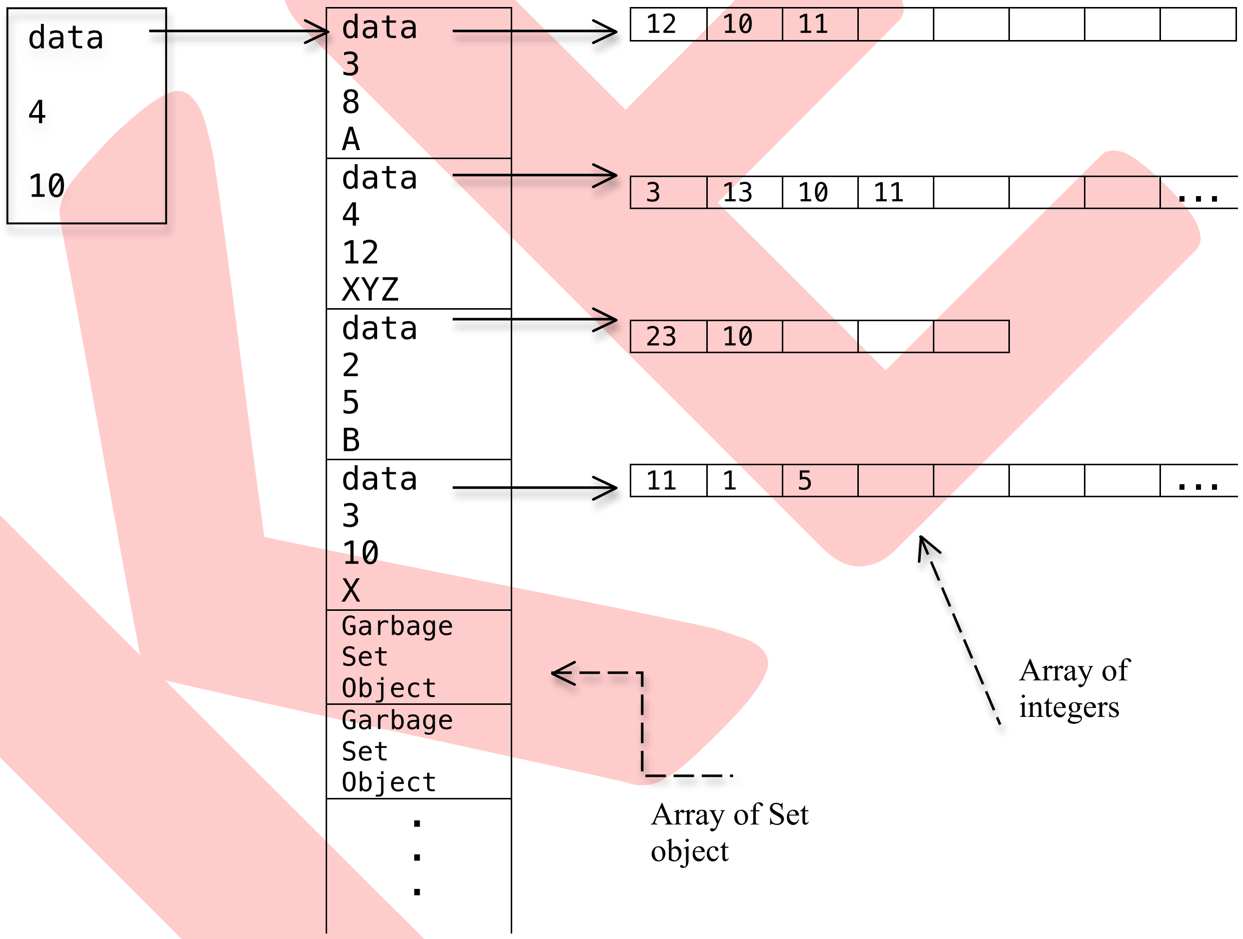
- The purpose of this quiz is to focus on the very basic fundamental concepts learned so far in previous lectures.

Following will help you to answer Question 1 and 2.
You guys should be quite familiar with struct 'Set' and struct 'SetArray'. The diagram below shows an object layout of a SetArray object named as 'sa', in which the number of sets stored by user are 4 and capacity to store sets in it is 10.

```
struct Set
{
    int * data;
    int noOfElements;
    int capacity;
    char name[30];
};
```

```
struct SetArray
{
    Set * data;
    int noOfSets;
    int capacity;
};
```

```
SetArray sa;
```



Question No. 1: **(2)**

What syntax should we write? If we have to access the second element from set of integers stored in 4th location of SetArray 'sa' object as shown in object layout above.

```
    sa.data[3].data[1];
```

Question No. 2: **(5)**

Write the following function, which receives SetArray object, and deallocate all the data/array pointed by data pointer of SetArray object.
Remember: To deallocate the array of integers captured by each set object.

void freeSetArray (SetArray & sa);

```
for ( int i=0; i<sa.noOfSets; i++)
{
    delete [] sa.data[i].data;
}
delete [] sa.data;
sa.data = 0;
```

Question No. 3: **(3)**

Consider the following code. There is checkbox in front of every line of code. You are required to tick that box if that particular line of code produces any compile-time or run-time error.
As an example one of the line of code is which certainly produces run-time error is already ticked.

```
void f(char * a)
{
    a[0]='A';                 ☐
}
void g(char a [])
{
    a[0]='A';                 ☐
}
int main()
{
   f("hello");                ☑

   g("bye");                  ☑

   char * p1 = "Not";         ☐

   char p2[] = "dont";        ☐

       f(p1);                 ☑

       g(p1);                 ☑

       f(p2);                 ☐

       g(p2);                 ☐


    return 1;
} //end main
```

Question No. 3: **(5)**

Create a class called **Employee** that includes three pieces of information as data members. A first name (type char[100]), a last name (type char[100]) and a monthly salary (type float).

- Provide a set and a get function for each data member. Monthly Salary should be >= 0.
- Write a member function that increases an employee's monthly salary by 10 percent.
- Write a test program that demonstrates class Employee's functionalities. Create two Employee objects and display each object's yearly salary. Then give each Employee a 10 percent raise and display each Employee's yearly salary again.

```
class Employee
{
private:
    char firstName[100];
    char lastName[100];
    float monthlySalary;
public:
    void setFirstName( char * fn )
    {
        strncpy(firstName, fn, sizeof(firstName)-1);
    }
    void setLastName( char * ln )
    {
        strncpy(lastName, ln, sizeof(lastName)-1);
    }
    void setMonthlySalary( float ms )
    {
        if ( ms >= 0 )
            monthlySalary = ms;
    }
    const char * getFirstName()
    {
        return firstName;
    }
    const char * getLastName()
    {
        return lastName;
    }
    float getMonthlySalary()
    {
        return monthlySalary;
    }
    void incrementMonthlySalaryTenPercent()
    {
        monthlySalary = monthlySalary * 1.1;
    }
};
int main()
{
    Employee e1, e2;

    e1.setFirstName("Ali");
    e1.setLastName("Umer");

    e1.setMonthlySalary(4000);
    e2.setMonthlySalary(50000);

    cout<<e1.getMonthlySalary()*12;
    cout<<endl<<e2.getMonthlySalary()*12;

    e1.incrementMonthlySalaryTenPercent();
    e2.incrementMonthlySalaryTenPercent();

    cout<<e1.getMonthlySalary()*12;
    cout<<endl<<e2.getMonthlySalary()*12;

    return 1;
}
```