

Problem1)

Given the class Student and the following code, sketch the memory representation of the variables and the objects. After that, list down the following at each marked position in the code: objects (instances), instance attributes, object state, and the references.

Student
+ id: int + name: String + gpa: float

```
int a = 5;  
Student s = new Student();  
s.id = 1;  
s.name = "Ahmad";  
s.gpa = 4.50f;  
//sketch the memory and list the required  
  
s.id = 2;  
s.name = "Khaled";  
//sketch the memory and list the required
```

Problem2)

Given the class SimpleNum and assuming that we ran this code:

```
SimpleNum s1 = new SimpleNum();  
SimpleNum s2 = new SimpleNum();  
s1.x = 3;  
s1.y = 10.0;
```

SimpleNum
+ x: int + y: double

Now, answer the following:

1. Sketch the memory representation of s1 and s2 after running these two lines of code:

```
s2.x = s1.x;  
s2.y = s1.y * 2.0 + 1.0;
```

2. Sketch the memory representation of s1 and s2 after running these two lines of code:

```
s2.x = 4;  
s2 = s1;
```

3. Sketch the memory representation of s1, s2, and s3 after running these lines of code:

```
s2 = s1;  
s2.x = 5;  
s2.y = 3.0 * s1.y;  
SimpleNum s3 = s1;
```