

### Clicker question

- After the first iteration of using Selection Sort on the array [7, 2, 3, 6, 3, 1], we get:
  - A. [7, 2, 3, 6, 3, 1]
  - B. [2, 7, 3, 6, 3, 1]
  - C. [1, 7, 2, 3, 6, 3]
  - D. [1, 2, 3, 6, 3, 7]

### Clicker question

- Given a trace of the result of each iteration of the outer loop of a sorting algorithm on the array [8, 2, 4, 6, 3, 1].
  - [2, 8, 4, 6, 3, 1]
  - [2, 4, 8, 6, 3, 1]
  - [2, 4, 6, 8, 3, 1]
  - [2, 3, 4, 6, 8, 1]
  - [1, 2, 3, 4, 6, 8]
- Determine which sorting algorithm was used.
  - A. Bubble sort
  - B. Insertion sort
  - C. Selection sort

### Counting: Permutations

- There are 10 kids from Fossil Ridge, 15 from Poudre High, 12 from Rocky Mountain HS, and 14 from Fort Collins HS. How many ways are there to line them up so that kids from the same school are grouped together.

### Counting: Combinations and sum rule

- How many bit strings of length 10 have at least most four 0's?

## Counting

- How many times must a pair of dice be rolled to ensure that the same value is obtained at least twice?

## Clicker question:

### Overloading/Overriding

Which statement is false?

- A. Overriding refers to redefining a method so that it has a different definition in a derived class
- B. Overloading refers to giving a method name two definitions that have different parameter lists
- C. Overriding refers to giving a method name two definitions that have different parameter lists

6

## Clicker question:

### Overloading/Overriding

Class Student contains method

```
public void doSomething(int x, int y) {
    // do something
}
```

Class UndergradStudent extends Student and contains

```
public void doSomething(int x, int y) {
    super(x, y);
    // do something else as well
}
```

The method doSomething in UndergradStudent illustrates:

- A. Overriding
- B. Overloading

7

## Clicker question:

### Overloading/Overriding

Class Student contains method

```
public void doSomething(int x, int y) {
    // do something
}
```

Class UndergradStudent extends Student and contains

```
public void doSomething(int x, int y, int z) {
    // do something
}
```

The method doSomething in UndergradStudent illustrates:

- A. Overriding
- B. Overloading

8

### Why will this not compile and what is the fix?

<pre>public class Rectangle {     private int width, height;      public Rectangle(int height, int width)     {         this.height = height;         this.width = width;     } }</pre>	<pre>public class Square extends Rectangle {      public Square (int width)     {         this.height = width;         this.width = width;     } }</pre>
---	--

9

### Will this work?

<pre>public class Rectangle {     private int width, height;      public Rectangle(int height, int width)     {         this.height = height;         this.width = width;     } }</pre>	<pre>public class Square extends Rectangle {      public Square (int width)     {         super(width, width);     } }</pre>
---	--

10

### Clicker question: is-a relationship

Class UndergradStudent extends Student. Which declaration below is illegal:

- UndergradStudent s = new Student();
- Student s = new Student();
- Student s = new UndergradStudent();
- UndergradStudent s = new UndergradStudent();
- None of the above

11

### Clicker question: single vs multiple inheritance

We have classes, P, Q, and R.  
We have interfaces IX, IY, and IZ.

Which declaration below is illegal:

- public class S extends P, Q
- public interface IV extends IX, IY
- public class S implements IX, IY
- public class S extends P implements IX, IY
- None of the above (i.e., all are legal)

12

**Clicker question:****Abstract classes and polymorphism**

- We have an interface IX.
- We have an abstract class P, that implements IX and also contains a no-arg constructor.
- We have a concrete class Q that extends P and has a no-arg constructor
- Which of the following is illegal?
  - A. IX p = new Q();
  - B. P p = new Q();
  - C. IX p = new P();
  - D. Q's constructor calls super()

13

**Clicker question: polymorphism**

- Class Pet has a method called speak(), which returns "Hi"
- Class Dog extends Pet and overrides speak(), which now returns "Woof".
- Pet p = new Dog();
- What does p.speak() return?
  - A. Hi
  - B. Woof
  - C. HiWoof
  - D. WoofHi
  - E. Program doesn't compile

**Clicker question: polymorphism**

- Class Pet has a method called speak(), which returns "Hi"
- Class Dog extends Pet and overrides speak(), which now returns "Woof".
- Dog p = new Pet();
- What does p.speak() return?
  - A. Hi
  - B. Woof
  - C. HiWoof
  - D. WoofHi
  - E. Doesn't compile

**Clicker question: Inheritance**

- Class Pet has a method called sit(), which returns "I am sitting"
- Class Cat extends Pet and has a method called speak(), which returns "meow".
- Cat c = new Cat();
- What does c.sit() return?
  - A. Error because sit cannot be found in Cat.
  - B. "I am sitting"
  - C. Cats don't obey

### Clicker question: Inheritance

- Class Pet has methods speak() and sit(),
  - Class Fish extends Pet and has a method called swim(), which returns "I am swimming".
  - Pet p = new Fish();
  - What does p.swim() return?
    - A. Error because swim cannot be found in Pet.
    - B. "I am swimming"
-