CSE 8A Lecture 20

- LAST WEEK! You made it! (Almost… ☺)
- PSA 9 due tonight (yayy!! Last one)
- Bring graded Exam #4 to Wed 3/13/13 lecture for review
  - Graded Exam #4 returned in lab tomorrow
- Exam #4 Statistics
  - **Median: 72.5% (14.5/20)**
    - **High: 100% (5 students) WOW!**
    - **90% or above - 59 students (20% of the class) - GOOD job!**
  - **CSE 8a class Median: 85.95%**
    - **High: 100.5% (11 students)**
    - **90% or above 103 students (34% of the class)**

Unraveling the magic of `main`

No more mystery!

Parameters (how are these passed in?)

Doesn't return anything

```
public static void main( String[] args )
```

Method name

Who "owns" the method…

About the Final

- Like a larger in-term exam
- **`B00 Wed 3/20/13 11:30am-1:30pm @ TBA`**
- **`A00 Fri 3/22/13 8am-10am @ Pepper Cyn 106`**
- Same format but 3-4x as long
- You will have 2 hours, but we will aim to create an exam the average student can finish in 1.5 hours
- You will fill in code (classes, constructors, basics)
- What will be on it? You tell me…

Major topics in CSE 8A

- With your group, list as many topics as you can think of for CSE8a.

Studying for the final

1. Redo (i.e. write out on paper):

   A. Interm Exam #1-#4 and Exam practice problems

   B. PI (clicker) questions

   B. Lab quiz questions

   C. Reading quiz questions

   Do this WITHOUT looking at the book. If you get stuck, STOP. Reread the relevant material in the book, maybe peek at the answer, then put the book away and try again

2. Get together with your friends (or post on Piazza for a group) and come up with new study questions. Then do those (using the same method)

1) Solo (1 min)
2) Discuss/Group (2 min)

How many objects are created in this code?

```
World  world1 = new World (200,100);
Turtle maria  = new Turtle(25, 25, world1);
Turtle jose   = new Turtle(100, 50, world1);
maria.forward( 25 );
jose.forward ( 10 );
maria.turnLeft( );
maria.forward( 50 );
jose.forward ( 5 );
```

A. 1
B. 2
C. 3
D. 4

1) Solo (30 secs)
2) Discuss/Group (1 min)

CS Concept: Data Types

What is the output of this code?

```
int    x = 3, z;
Turtle y = 2;

System.out.println( x == 3 );

z = x + y;
System.out.println( z );
```

A) 3
5

B) true
5

E) None of the above.

C) 3
false

D) true
false

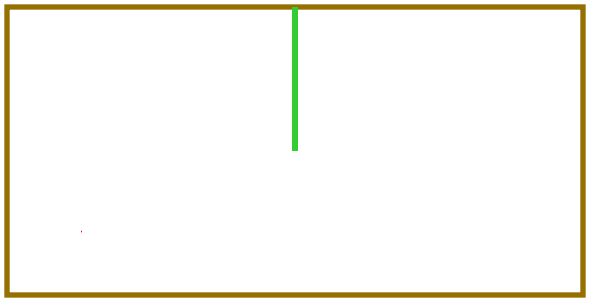
1) Solo (30 secs)
2) Discuss/Group (1 min)

CS Concept: References

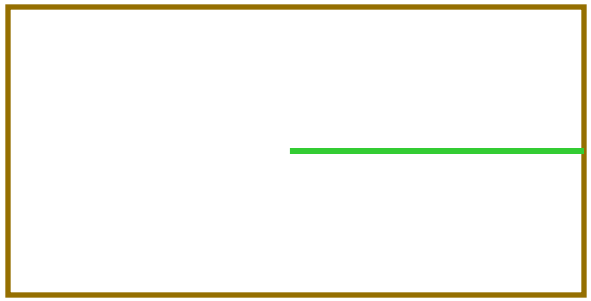
What does this code draw?

```
World  world1 = new World ( 200,100 );
Turtle maria  = new Turtle( 25, 25, world1 );
Turtle jose   = new Turtle( 100, 50, world1 );
maria = jose;
maria.forward( 50 );
jose.turn( 90 );
jose.forward( 50 );
```

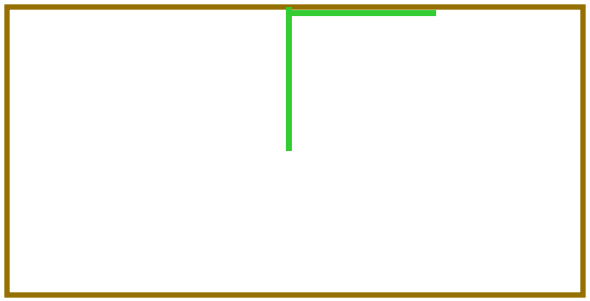
A



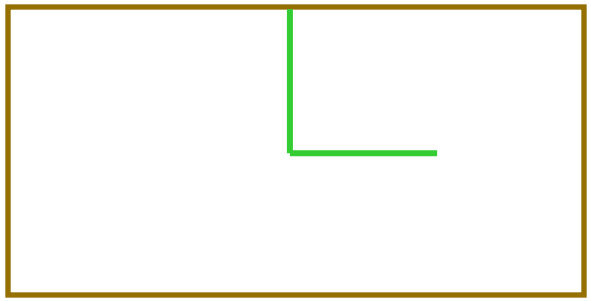
C



B



D



1) Solo (30 secs)
2) Discuss/Group (1 min)

Why is this code incorrect?

Assume this code exists inside the `Turtle` class in the `Turtle.java` file

```
public void drawSquare()
{
  turtle1.turnLeft();
  turtle1.forward( 100 );
  turtle1.turnLeft();
  turtle1.forward( 100 );

  turtle1.turnLeft();
  turtle1.forward( 100 );
  turtle1.turnLeft();
  turtle1.forward( 100 );
}
```

A. Nothing is incorrect

B. Return type is wrong

C. There needs to be a parameter

D. turnLeft should be turnRight

E. use of `turtle1` is incorrect

1) Solo: (20 sec)
2) Discuss/Group: (1 min)

Primitives vs. Objects: Review

What does the following code print?

```
int remzisAge  = 19;
int rominasAge = 25;

remzisAge  = rominasAge;
rominasAge = 20;
print( "Remzi is " + remzisAge + " and Romina is " + rominasAge );
```

A. Remzi is 19 and Romina is 25

B. Remzi is 20 and Romina is 20

C. Remzi is 25 and Romina is 20

D. Remzi is 25 and Romina is 25

E. Remzi is 19 and Romina is 20

1) Solo: (45 sec)
2) Discuss/Group: (1 min)

CS Concept: for each loops

```
Pixel[] pixelArray = this.getPixels();
int  value = 0;
for( Pixel pixelObj : pixelArray )
{
  value = pixelObj.getGreen();
  pixelObj.setBlue( value );
}
```

What does this code do?

A. Decreases the blue component of a picture

B. Sets the green component of each pixel to be the same as the blue component

C. Sets the blue component of each pixel to be the same as the green component

D. Loops over all pixels in pixelArray. For each pixelObj calls getGreen and stores that into value. Then sets value into blue.

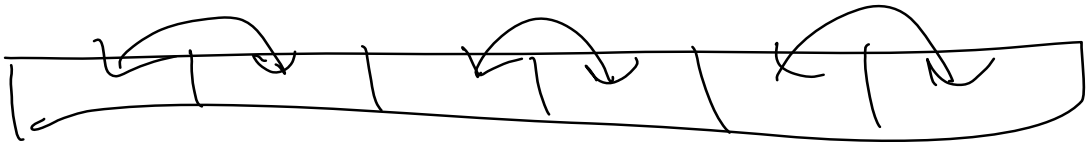
E. None of the above.

What picture most accurately describes what this code does ?

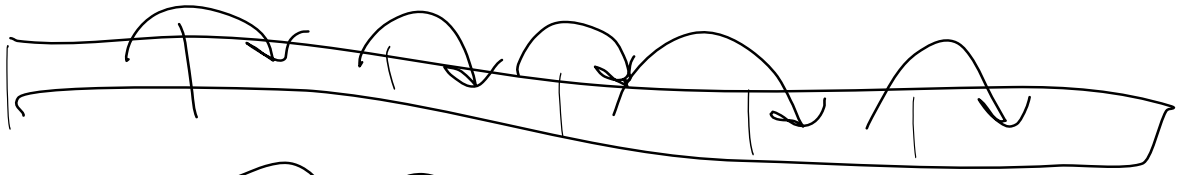
```
int     index, value = 0;
Pixel   p = null, q = null;
Pixel[] pixelArray = this.getPixels();

for( index = 0 ; index < pixelArray.length-1 ; index++ )
{
  p = pixelArray[ index+1 ];
  q = pixelArray[ index ];
  p.setRed   ( q.getRed() );
  p.setBlue  ( q.getBlue() );
  p.setGreen( q.getGreen() );
}
```

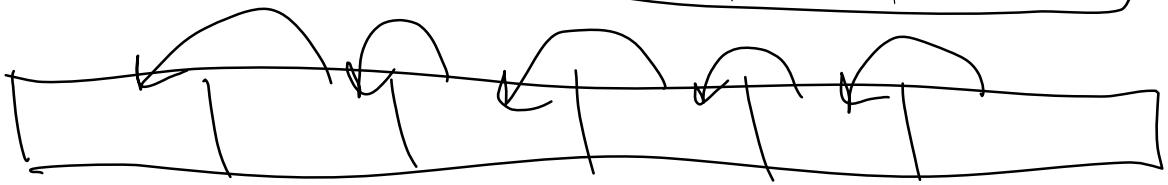
A)



B



C



D. None of these.

1) Solo: (30 sec)
2) Discuss/Group (2 min)

Nested Loops: How do they work? What order are pixels changed?

A method in Picture.java… what does it print if width is 2 and height is 3?

```
int foo, bar;
Pixel p;

for( foo = 0 ; foo < getWidth()  ; foo++ )
  for( bar = 0 ; bar < getHeight() ; bar++ )
     System.out.println( foo + " " + bar );
```

A
0 0
0 1
1 0
1 1
2 0
2 1

B.
0 0
1 0
2 0
0 1
1 1
2 1

C.
0 0
0 1
0 2
1 0
1 1
1 2

D.
0 0
1 1
2 2

1) Solo: (30 sec)
2) Discuss/Group: (2min)

Why does this have an error?

In a method in Picture.java… assume height = 50, width = 100

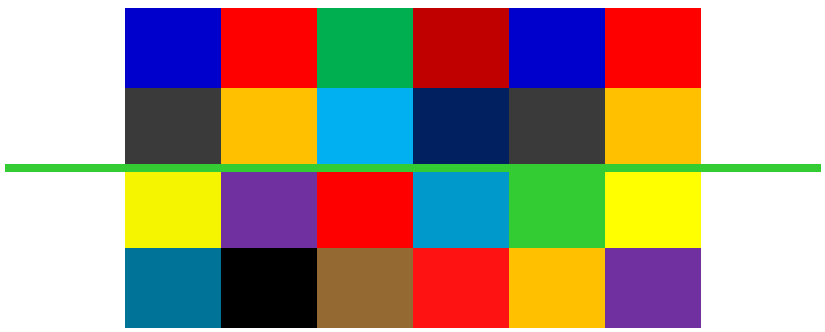
```
int bar, foo;
Pixel p;

for( bar = 0 ; bar < getWidth() ;  bar++ )
  for( foo = 0 ; foo < getHeight() ; foo++ )
  {
     p = getPixel(foo, bar);
     p.setColor(Color.BLACK);
  }
```

A. It doesn't, this loops across rows, top to bottom
B. It doesn't, this loops down columns, left to right
C. It tries to index a pixel off the end of a row (x value too big)
D. It tries to index a pixel off the end of a column (y value too big)

1) Solo: (30 sec)
2) Discuss/Group (1 min)

What are the first (x,y) coords for topP and bottomP to mirror around **horizontal** axis?



	topP	bottomP
A.	(0,0)	(0,3)
	(0,1)	(0,2)
	(1,0)	(1,3)
B.	(0,0)	(0,3)
	(1,0)	(1,3)
	(2,0)	(2,3)

C. either A or B will work

D. none of the above

Parameters and return values

In Picture.java…

```
public Picture copyRegionToNew(int xSource, int ySource, int xTarget, int yTarget)
{
  Picture newCanvas = new Picture();
  Pixel sPixel, tPixel = null;
  for(int sX = xSource, tX = xTarget; sX < 100+xSource; sX++, tX++ )
    for(int sY = ySource, tY = yTarget; sY < 100+ySource; sY++, tY++ )
    {
      sPixel = this.getPixel( sX,sY );
      tPixel = newCanvas.getPixel( tX,tY );
      tPixel.setColor(sPixel.getColor());
    }
}
```

In main…

```
Picture fish = new Picture( "fish.jpg" );
Picture newCanvas = fish.copyRegionToNew(10, 30, 50, 50);
newCanvas.show();
```

What error will the code above produce?

A.This code will not compile

B.The line “Picture newCanvas = fish.copyRegionToNew…” in main will cause an error

C.The line newCanvas.show() will cause an error

1) Solo: (30 sec)
2) Discuss/Group: (1 min)

Select the if statement to make bottom half of picture some color

```
public void fillBottom( Color newColor )
{
  Pixel pix;

  for (int y = 0; y < this.getHeight(); y++)

    for (int x = 0; x < this.getWidth(); x++)

      <<<SELECT LINE OF CODE>>>>

      {
          pix = this.getPixel(x,y);

          pix.setColor(newColor);
      }
}
```

A) `if( y < this.getHeight() / 2 )`

B) `if( y > this.getHeight() /2 )`

C) `if( this.getPixel(x,y) < this.getHeight() / 2 )`

D) `if( this.getPixel(x,y) > this.getHeight() / 2 )`

1) Solo: (45 sec)
2) Discuss/Group: (1 min)

Same operation with if statement control

```
public void everyOtherColumn( Color newColor )
{
  int x, y;
  Pixel pix;
  for( y = 0 ; y < this.getHeight() ; y++ )
     for(x = 0 ; x < this.getWidth() ; x++ )
     {
        <<SELECT LINE OF CODE TO GO HERE>>
         pix = this.getPixel( x,y );
         pix.setColor( newColor );
     }
}
```

A) `if( x < this.getWidth() / 2 )`

B) `if( x < this.getHeight() / 2 )`

C) `if(( x % 2 ) == 0 )`

D) `if( ( this.getPixel( x,y ) % 2 ) == 0 )`

CS Concept: Booleans *are* values

```
if( absValZ < 2.0 )
    return true;
else
    return false;
```

Which of the following is equivalent to the above code?

A. `return absValZ;`

B. `return absValZ < 2.0;`

C. `return absValZ >= 2.0;`

D. None of these

1) Solo: (60 sec)
2) Discuss/Group (2 min)

What's printed by this code?
(assume calling object as shown)

60	80	60	65	100	90	A	blue	red	black

```
public void guess()
{
  int i, foo, a = 0, b = 0;
  SoundSample[] noiseArray = this.getSamples();

  for( i = 0 ; i < noiseArray.length ; i++ )
  {
    SoundSample sample = noiseArray[i];
    foo = sample.getValue();
    if (foo > a)
    {
      a = foo;
      b = i;
    }
  }
  System.out.println(a + "," + b);
}
```

A. 0,9

B. 60,0

C. 90,5

D. 100,4

E. None of the above

TODO

- Study
- CAPES and Supplemental survey (if you haven’t already)