



Midterm

- Monday, October 29
- In class
- You may use the text book as a reference
- Chapters 1-5, 7 and 8
 - Excluding sections 7.13, 7.16-7.18, 8.6-8.9
- Anything from slides
- Anything from readings and assignments



Midterm Topics

- Java syntax, data types
- Java control flow, expression evaluation
- Object Oriented concepts
- Classes and methods
- Constructors
- Objects and references
- Number base conversion



Midterm Question Format

- Multiple choice questions
- Programming questions
- Calculation questions



Example Questions

Of the following types, which one cannot store a numeric value?

- a) byte
- b) float
- c) boolean
- d) int



Example Questions

Which of the following are Object Oriented principles?

- a) encapsulation
- b) data hiding
- c) abstraction
- d) all of the above



Example Questions

If `x` is an `int` and `y` is a `float`, which one of the following is not a legal assignment statement?

- a) `y = x;`
- b) `x = y;`
- c) `y = (float) x;`
- d) `x = (int) y;`



Example Questions

Assume that **x**, **y**, and **z** are all ints equal to 50, 20, and 6. What is the value of **x / y / z** ?

- a) 16
- b) 12
- c) 0
- d) A syntax error as this is syntactically invalid
- e) A run-time error since this is a division by 0

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Example Questions

If we have the statement

```
String s = "Hello world";
```

What is returned by `s.charAt(1)` ?

- a) 'H'
- b) 'e'
- c) 'l'
- d) "Hello"

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Example Questions

Suppose you have three String variables **a**, **b**, **c**.
The statement `c = a + b;` can also be achieved by:

- a) `c = a.length() + b.length();`
- b) `c = (int) a + (int) b;`
- c) `c = a.concat(b);`
- d) `c = b.concat(a);`
- e) `c = String.concat(a,b);`

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Example Questions

Assume that **q**, **x**, **y**, and **z** are int variables with **x** = 1, **y** = 10, **z** = -3. Which of the following is true after this statement is executed?

```
q = (x++ * y--) + ++z;
```

- a) `q == 7`
- b) `q == 16`
- c) `q == 22`
- d) `q == 8`

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Example Questions

Assume that `q`, `x`, `y`, and `z` are `int` variables.
Rewrite this statement as a sequence of simple statements without the increment and decrement operators, and with at most one operation in each statement.

```
q = (x++ * y--) + ++z;
```



Example Questions

What value will `z` have after the statement:

```
int z = 5.0 / 10;
```

- a) 0
- b) 0.5
- c) 5.0
- d) 2.0
- e) none of the above, a compile-time error arises because `z` is an `int` and `5.0 / 10` is a `double`



Example Questions

Assume that `x` is an int variable with `x = 1`.
What will be the value of `x` after this loop
terminates? `while (x < 100) x *= 2;`

- a) 2
- b) 101
- c) 64
- d) 128



Base Conversions

Convert from binary to octal:

`01111010`

Convert from binary to hexadecimal:

`01111010`



Example Questions

Fill in the code in a method to extract the first letter of each word in a String. A word consists just of letters. You may use the static method `Character.isLetter(ch)` which returns true if the character `ch` is a letter.

```
String initials(String s) {  
  
  
  
  
}
```

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Example Questions

Fill in the code for class `Rectangle` so that it works with this test driver code.

```
public static void main(String[] args) {  
    // Create two Rectangle objects  
    Rectangle rect1 = new Rectangle(4, 11);  
    Rectangle rect2 = new Rectangle(7, 7);  
    System.out.println("area of rect1 is " + rect1.area());  
    if (rect2.isSquare())  
        System.out.println("rect2 is a square");  
    System.out.println("rect1 is" + rect1);  
    System.out.println("rect2 is" + rect2);  
    rect1.growByFactor(2.5);  
    System.out.println("rect1 is" + rect1);  
}
```

Output:

```
area of rect1 is 44  
rect2 is a square  
rect1 isRectangle with dimensions 4 and 11  
rect2 isRectangle with dimensions 7 and 7  
rect1 isRectangle with dimensions 10 and 27
```

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