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# Review Sheet for Test #1

1. Basics
    a. Variables vs literals
        i. A literal represents a specific, unchanging value
        ii. A variable is a named piece of memory where a value can be stored,
    b. Primitive types vs reference types
        i. A primitive type is a data type where the data is stored directly in the memory.
        ii. A reference type is a data type that has methods defined on it.
        iii. Reference types store the address of an object rather than a value in and of itself.

c. Variables
        i. Declaring variables
        ii. Initializing variables
        iii. Assigning values to variables
            1. int x = 3;
            2. int y = x;
            3. x++;
        iv. Compound assignment eg:
            1. Product *= value;
            2. Total += i;
        v. Data Types
            1. int
            2. double
            3. char
            4. boolean
            5. String
            6. Scanner
        vi. Operator precedence
            1. * / come before + -
            2. We need to put parentheses around lower precedence subexpressions to force Java to evaluate them first.

2. Input/Output

a. System.out vs System.err
b. println vs print
c. Scanner
    i. How to create a Scanner?
        1. Scanner s = new Scanner(System.in);
    ii. The import statement
    iii. Reading in input
        1. int x = s.nextInt();
        2. double y = s.nextDouble();
        3. String word = s.next();
        4. String line = s.nextLine();

3. Conditionals
    a. If-statement
        i. Header – if(Boolean test) {
        ii. Body – the statements that are executed if the test is true.
    b. Else
        i. Is executed if the Boolean test is false
        ii. Can have another if inside of it
    c. Cascading ifs
        i. If-else if-else if- else if- ….- else
    d. Nested if
        i. if (test) {

            if(other test) {

    e. and &&
    f. or ||
    g. not !
    h. precedence order is ! then && then ||
    i. switch
    j. How to compare primitive types for equality, relative order.
    k. How to compare reference types (e.g. Strings) for equality. If applicable, relative ordering (e.g. Strings)
    l. ternary operator
4. Loops
    a. For loops
        i. Header

1. Initialization step
2. Boolean test
3. Update

ii. Body

1. Statements that are executed during each iteration of the loop

iii. Execution of a for loop

1. Initialization step
2. Boolean test (if true, go to step 3. If not, stop)
3. Body
4. Update
5. Go back to step 2

iv. The header method

1. The user tells you up front how many pieces of data they have to process. Solution is to run a for loop that counts that many iterations and ask the user for their input one item at a time.

b. While loops

i. A Boolean test
ii. Body
iii. Execution of a while loop

1. Check the Boolean test. If true, go to step 2
2. Run the body of the loop.
3. Go back to step 1

iv. Trailer method

1. User can tell you when they want to stop by inputting a sentinel. Solution is to prompt the user for data. If it's not the sentinel, process the data and then prompt for another data item.

5. Problem solving
   a. Is a number even? Odd? Divisible by d?
   b. Is a number prime? Composite?
   c. Is a character upper case? Lower case?
   d. Converting to/from upper case
   e. Adding up a bunch of numbers
   f. Multiplying up a bunch of numbers

g. Swapping
h. Finding the average of a few numbers
i. Finding the min or max of 2 and 3 numbers.