Midterm Examination #1
CSE 11 , UCSD
Practice

RULES:

1. Don't start the exam until you are told to.

2.. This is a closed-book, closed-notes exam. Don't refer to any materials other than the exam itself.

3. Write your name, and your cs11 login name, on each page of the exam when you get to it.

4. Do not look at anyone else's exam. Do not talk to anyone but an exam proctor during the exam.
If you're wearing a billed cap, turn it so the bill is facing back, or take it off. Turn off cell phones and pagers.

5. If you have a question, raise your hand and an exam proctor will come to you.

6. You have 1 hour and 15 minutes to finish the exam. When you are done, give your exam to a proctor. The proctor will check your picture ID and sign the ID check below.

7. . Your exam grade will be emailed to your cs11 account within 2 working days. Exams will be handed back in special section next week.

#	Topic	max pts	actual pts
1.	General T/F	18	
2.	Identifiers	6	
3.	Literals	10	
4.	Expression eval.	14	
5.	Expression conv.	9	
6.	Syntax and scope	12	
7.	Iteration	16	
8.	Code interp.	15	
	TOTAL	100	

grader:_____

PROCTOR ID CHECK:_____

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1. [18 pts.] (1 pt each correct; -1 pt each incorrect; 0 pt each blank) **T**rue or **F**alse:

   a. ___F___ Runtime errors in programs are detected by the compiler.
   b. ___T___ Java is a high-level language.
   c. ___T___ A program should be designed before it is implemented.
   d. ___T___ In UNIX, **`mkdir Test.java`** is the command for creating a directory named **`Test.java`**.
   e. ___T___ To test whether **`x`** is between **`2`** and **`3`** you can use the Java boolean expression **`!(x=<2) && !(x>=3)`**
   f. ___T___ In Java, a **`double`** variable can represent a larger number than a **`long`** variable can.
   g. ___T___ A data type is a collection of values, together with collection of operations on those values.
   h. ___F___ Correct indentation is important in a Java program, because otherwise the program will not compile.
   i. ___F___ Every void method definition in Java must contain a return statement somewhere in it.
   j. ___F___ In Java, an **`int`** variable contains 16 bits on a Windows 3.1 system, but 32 bits on a UNIX system.
   k. ___T___ "Make all instance variables private" is a good general rule of ADT design.
   l. ___T___ "Top-down" software design involves decomposing a problem into subproblems.
   m. ___T___ All objects of the same class have the same types of instance variables and the same instance methods.
   n. ___F___ To use a static method of a class, there must first be an instance of the class.
   o. ___F___ A method prototype specifies how the method carries out a computation.
   p. ___T___ In Java, the controlling expression of a **`while`** statement must be of type boolean.
   q. ___F___ In Java, every class must have a "public static void main" method.
   r. ___T___ **`while`** and **`do-while`** statements are examples of iterative control constructs in Java.

2. [6 pts.] (1 pt each) For each of the following, put YES if it is a syntactically correct Java identifier, NO if not.

   a. __NO____ **`midterm#1`**
   b. __YES____ **`_the_Answer_`**
   c. __NO____ **`++n`**
   d. __YES____ **`Twelve22`**
   e. __NO____ **`SavitchIn.readline()`**
   f. __YES____ **`main`**

3. [10 pts.] (2 pts each) For each of the following, write I if it is an integer literal constant; F if it is a floating literal constant; C if it is a character literal constant; S if it is a string literal constant; N if it is none of these.

   a. __N____ **`1,000,000`**
   b. __N____ **`final char c;`**
   c. __C____ **`'\t'`**
   d. __N____ **`1.0e1.0`**
   e. __S____ **`"Done.\n"`**

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4. [14 pts] (2 pts each) Consider these declaration statements:

```
double x1 = 0.0, x2 = 5.0, x3;
int i=7, j=8, k=9;
```

Now consider each of the following expressions in order, in the context of those declarations.
For each, write the *value* of the expression, ignoring side effects, or ERR if the expression is illegal in Java.
Write your answer as a literal constant of the appropriate type.

a. ___ERR_____ **(boolean) (i-j)**

b. ___2.5_____ (**x1 + 0.5) * x2**

c. ___0.0_____ **x3 = x2 = x1**

d. ___false_____ **x1 > k**

e. ___0_____ **j % 4**

f. ___ERR_____ **i < j < k**

g. ___10_____ **i++ + 3**

5. [9 pts.] (3 pts each) Translate each of the following mathematical formulas into Java expressions. Assume variables **a,b,c,p,q,x,y,z** have been declared **double**. Don't use any library functions in your answer.

a. $b^4 - 4c$ in Java is:____b*b*b*b - 4*c_____

b. $\frac{3z + 2}{z + 2}$ in Java is:____(3*z + 2) / (z + 2)_____

c. $p \div q + 10^{200}$ in Java is:____p/q + 1e200_____

6. [12 pts.] Consider the following Java program:

```
public class Test {
    public static int method(int arg)
    {
        System.out.println(arg);
        arg = arg + 3;
        System.out.println(arg);
        return arg;
    }
    public static void main(String args[])
    {
        int arg=5;
        int num=3;
        num = method(num);
        System.out.println(num);
        System.out.println(arg);
    }
}
```

When the program is run, four numbers will be printed out. What are they?
First __3_____, then __6_____, then __6_____, finally__5_____.

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7. [16 pts.] For each Java program fragment below, say how many lines are printed out, and what the largest number printed out is; or write INF in both blanks if it is an infinite loop.

a.
```
int num=300;
while (num-- > 200) System.out.println(num);
```

Number of lines printed:___100____ Largest number printed:__299_____
---

b.
```
int index = 10;
do {
        index = index - 2;
        System.out.println(index);
} while (index == 0);
```

Number of lines printed:__1_____ Largest number printed:___8_____
---

8. [15 pts; 3pts ea correct, -3pts ea incorrect, 0pts each blank] The problem is to print out all and only the 51 even integers from 0 through 100 (inclusive), in any order. For each of the following program fragments, write "YES" if it solves the problem correctly, else "NO". (Look & think carefully. Leave it blank if you're not sure!)

__YES____ A.
```
int n=0;
do {
    if (n%2 == 0) System.out.println(n);
} while(n++<100);
```

__NO____ B.
```
int n=99;
while(n>0) {
    System.out.println(99-n);
    n -= 2;
}
```

__NO____ C.
```
int n = 0;
do {
    System.out.println(n*2); n=n+1;
} while(n<50);
```

__NO____ D.
```
int n=0;
while (n++ < 50) {
    System.out.println(n); System.out.println(n+2);
}
```

__YES____ E.
```
int n = 0;
while (n < 101) {
    if (n/2 == n/2.) System.out.println(n);
    n++;
}
```

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