

Philip Pesic

Week 9

March 19 2023

Week 9 Midterm

Write a Java program that

Declares

a) Four integer datatype variables: `int iAnswer = 0, int i1 = 10, int i2 = 20, int i3 = 30;`

b) Four decimal datatype variables: `double dAnswer=0, double d1 = 1.1; double d2 = 2.2;`
`double d3 = 3.3;`

Calculate and Explain "carefully", precisely WHY you get each answer. (2 points each)

```
package Midterm;

class Midterm {
    public static void main(String[] args) {

        int iAnswer;
        int i1 = 10;
        int i2 = 20;
        int i3 = 30;

        double dAnswer;
        double d1 = 1.1;
        double d2 = 2.2;
        double d3 = 3.3;

        iAnswer = i2/i1;
        System.out.println("iAnswer = i2/i1: " +iAnswer); //Answer: 2 | 20/10 = 2 |
        integers can store int values
    }
}
```

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```
iAnswer = i1/i3;
System.out.println("iAnswer = i1/i3: " + iAnswer ); //Answer: 0 | 10/30 =
0.33333 | int cannot store floating point values | Truncated/abbreviated from the
right to 0

dAnswer = i2/i1;
System.out.println("dAnswer = i2/i1: " + dAnswer ); //Answer: 2.0 | 20/10 = 2
| 2.0 == 2, but stored as double due to dAnswer datatype

dAnswer = i1/i2;
System.out.println("dAnswer = i1/i2: " + dAnswer ); //Answer: 0.0 | 10/20 = 0.5
| dAnswer is double, but compiler cannot compute decimal from int/int | Truncated to
0.0

dAnswer = d1/d2;
System.out.println("dAnswer = d1/d2: " + dAnswer ); //Answer: 0.5 | 1.1/2.2 =
0.5 | double can store double values

// iAnswer = i2/d3;
// System.out.println("iAnswer = i2/d3: " + dAnswer ); //Cannot compile |
int/double cannot be stored as int value since a floating point value is returned |
Commented out so program can compile

dAnswer = i1/d3;
System.out.println("dAnswer = i1/d3: " + dAnswer ); //Answer:
0.030303030303030303 | 10/3.3 = 0.030303030303030303 | int/double can be stored as double,
but double datatype only stores 52 bits/16 digits of floating point numbers

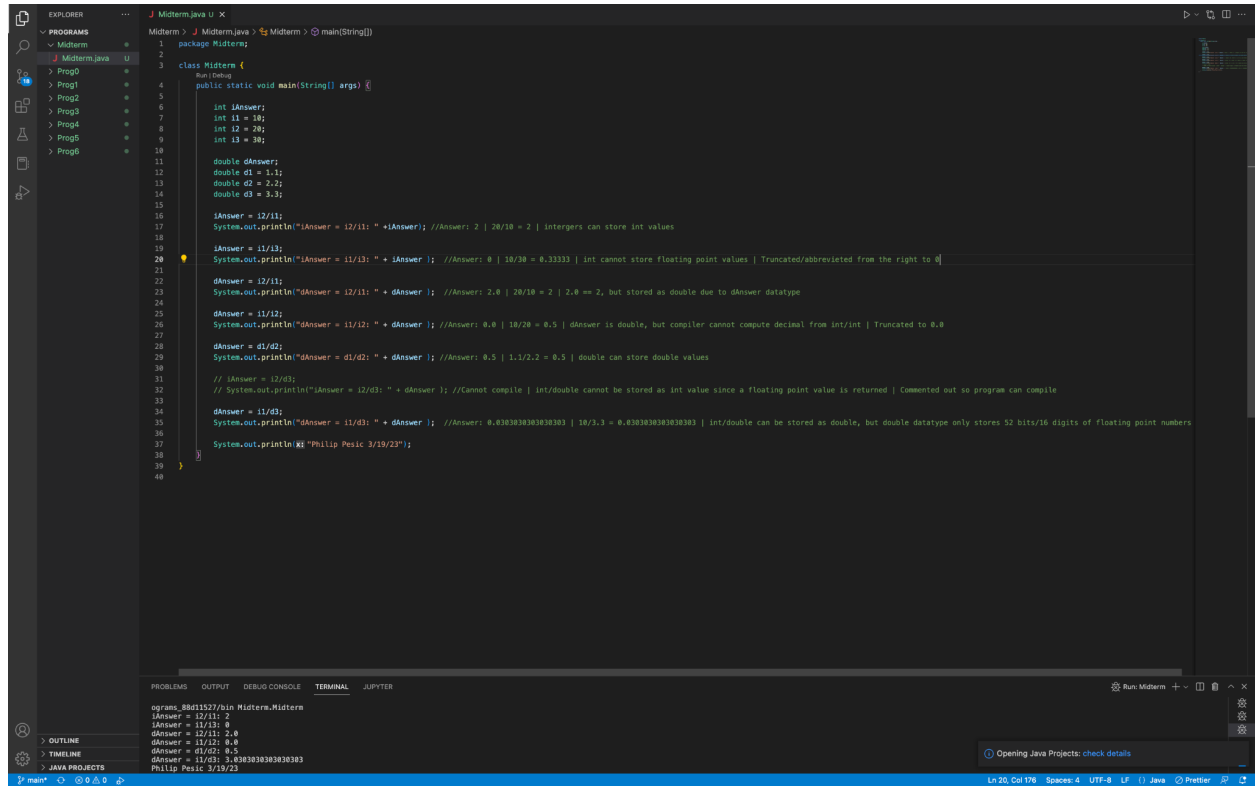
System.out.println("Philip Pesic 3/19/23");
}
}
```

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```
1 package Midterm;
2
3 class Midterm {
4     public static void main(String[] args) {
5
6         int iAnswer;
7         int i1 = 10;
8         int i2 = 20;
9         int i3 = 30;
10
11         double dAnswer;
12         double d1 = 1.1;
13         double d2 = 2.2;
14         double d3 = 3.3;
15
16         iAnswer = i2/i1;
17         System.out.println("iAnswer = i2/i1: " + iAnswer); //Answer: 2 | 20/10 = 2 | integers can store int values
18
19         iAnswer = i1/i3;
20         System.out.println("iAnswer = i1/i3: " + iAnswer); //Answer: 0 | 10/30 = 0.33333 | int cannot store floating point values | Truncated/abbreviated from the right to 0
21
22         dAnswer = i2/i1;
23         System.out.println("dAnswer = i2/i1: " + dAnswer); //Answer: 2.0 | 20/10 = 2 | 2.0 == 2, but stored as double due to dAnswer datatype
24
25         dAnswer = i1/i2;
26         System.out.println("dAnswer = i1/i2: " + dAnswer); //Answer: 0.5 | 10/20 = 0.5 | dAnswer is double, but compiler cannot compute decimal from int/int | Truncated to 0.5
27
28         dAnswer = d1/d2;
29         System.out.println("dAnswer = d1/d2: " + dAnswer); //Answer: 0.5 | 1.1/2.2 = 0.5 | double can store double values
30
31         // iAnswer = i2/d3;
32         // System.out.println("iAnswer = i2/d3: " + iAnswer); //Cannot compile | int/double cannot be stored as int value since a floating point value is returned | Commented out so program can compile
33
34         dAnswer = i1/d3;
35         System.out.println("dAnswer = i1/d3: " + dAnswer); //Answer: 0.3333333333333333 | 10/3.3 = 0.30303030303030303 | int/double can be stored as double, but double datatype only stores 52 bits/16 digits of floating point numbers
36
37         System.out.println("Philip Pesic 3/19/23");
38     }
39 }
40
```

oگرام_88411527/bin/Midterm_Midterm

```
iAnswer = i2/i1: 2
iAnswer = i1/i3: 0
dAnswer = i2/i1: 2.0
dAnswer = i1/i2: 0.5
dAnswer = d1/d2: 0.5
dAnswer = i1/d3: 0.3333333333333333
Philip Pesic 3/19/23
```

I learned: how ints and doubles handle floating point values