Homework – Casting

1. Copy the following code into the main of a new class.
   - for each **assignment** statement write a note about what conversions take place &/or what rules are being used
   - for each **output** statement, write what the output is.
   - for each **error line**, take away the // to view the error message and describe why that line causes an error (in your own words)

Note: Some examples are done for you in red below

```
---------- code -------------------------


int i1 = 5;              //ok; default type for non-decimal is int
//int i2 = 5.2;          //error because assigned type is double not int

float f1 = 2;           //ok
float f2 = 3.0f;        //ok; f signifies to interpret as float
//float f2 = 3.0;        //error because double value is not float
//float f3 = 3.5;        //error because double value is not float

double d1 = 3.5;         //ok; default type for decimal is double
double d2 = 2.0;         //ok
double d3 = 4;           //ok
double d4 = 3.5d;        //ok; d signifies to interpret as double

i1 = (int) d1;           //explicit casting of a double into an int
System.out.println ("i = " + i1);    //prints i = 3

//i1 = 5.0 / 9.0;        //error because float can't be automatically   //
                         converted to int
i1 = 5 / 9;              // division of integers yields integer
System.out.println ("i = " + i1);    // prints i = 0

f1 = (float) d1;         // casts f1 to float type
System.out.println ("f = " + f1);    // prints f = 2.0


f1 = 5 / 9;          // assigns f1 to 5/9
System.out.println ("f = " + f1);
//f1 = 5.0/9.0;          //error because double values are not floats
f1 = 5.0f / 9.0f;        // is ok because doubles are set to floats
System.out.println ("f = " + f1);    prints f = 0.55555

d1 = 3.5 / 2.6;          // sets d1 to 3.5/2.6
System.out.println ("d = " + d1);    // prints d = 1.3462

d1 = (int) 3.5 / 2.6;    // casts 3.5 to int and divides by 2.6
System.out.println ("d = " + d1); // prints d = 1.4286

d1 = (int) (3.5) / 2.6;  // same as above
```

```
System.out.println ("d = " + d1);    // same as above

d1 = (int) (3.5 / 2.6);  // casts 3.5/2.6 to int
System.out.println ("d = " + d1);    // prints 1.0

//d1 = int 3.5 / 2.6;   // error because int must be in brackets to cast


d1 = (int) (3.5 / 2.6); // same as above
System.out.println ("d = " + d1); // same as above

d1 = 3.5 / (int) 2.6; // casts 2.6 to int and divides 3.5 by it
System.out.println ("d = " + d1); // prints d = 1.75

d1 = (float) (int) (3.5 / 2.6); // casts 3.5/2.6 to int then to float
System.out.println ("d = " + d1); // prints d = 1.0

short smallValue = 45;   // sets short value 45 to var smallValue
//short s = 3.5;                // error because small values are whole
//smallValue = 234251434324324; //error because val too large

int littleValue = smallValue;  // sets littleValue to smallValue's value

smallValue = (short) littleValue; // casts littleValue to short and sets
smallValue to it
System.out.println ("smallValue = " + smallValue); // prints smallValue =
45
smallValue = (short) 234251434; // casts 234251424 to short and sets
smallValue to it
System.out.println ("smallValue = " + smallValue); prints smallValue =
25770

//int over = 1111111111111; //error because… int num too large

float pay = 42234.45f; // sets float pay to 2 decimal places
long bigValue = 45243224L; // sets bigValue to a num which is long
double amount = 345.45d; // sets amount to a double value
```

2. **Average.java** Write a program that prompts the user for five grades and then displays the average of the grades. The grades are integers and they must be stored in variables of type `int`. Real division should be performed when calculating the average.

3. **Change_New.java** Create a program that prompts the user for an amount in dollar and then displays the minimum number of coins necessary to make the change. The change can be made up of toonies ($2), loonies ($1), quarters (25 cents), dimes (10 cents), nickels (5 cents), and pennies (1 cent). The program output should look similar to :

```
Enter the amount (in dollar): 5.34
The minimum number of coins is:
      Toonies: 2
      Loonies: 1
      Quarters: 1
```

```
Dimes: 0
Nickels: 1
Pennies: 4
```