

Exercise 1.3

1. What (if anything) is wrong with each of the following statements? (1)
 - a. `if (a > b) then c = 0;`
 - b. `if a > b { c = 0; }`
 - c. `if (a > b) c = 0;`
 - d. `if (a > b) c = 0 else b = 0;`

2. Write a code fragment that prints “true” if the double variables `x` and `y` are both strictly between 0 and 1, and “false” otherwise. (2)

3. The variables `i` and `j` are both type `int`. What is the value of `j` after each of the following statements is executed? (3)
 - a. `for (i = 10; i > 0; i--) j += i;`
 - b. `for (j = 0; j < 10; j++) j += j;`
 - c. `for (i = 0, j = 2; i < 10; i++) j += i;`

4. Modify the `TenHelloWorlds.java` program to use a `for` loop? (2)

5. What is the value of `m` and `n` after executing the following code? (2)

```
int n = 123456789;
int m = 0;
while (n != 0) {
    m = (10 * m) + (n % 10);
    n = n / 10;
}
```

6. Create a program that calculates the Amortization Schedule of a loan. The formula to use to calculate the monthly payments of a loan is: (10)

$$A = P \frac{r(1+r)^n}{(1+r)^n - 1}$$

Where A = monthly payment, P = principal, r = monthly interest rate in decimal notation (not percentage) and n = number of months

Payment	Amount	Interest	Principal	Balance
				20,000.00
1	400.76	125.00	275.76	19,724.24
2	400.76	123.28	277.48	19,446.76
3	400.76	121.54	279.22	19,167.54
...
59	400.76	4.96	395.80	398.18
60	400.67	2.49	398.18	0.00

The interest portion of the payment is calculated as the rate times the previous balance and is usually rounded to the nearest cent. The above table uses test values of \$20,000 loan, 7.5% interest, 5 years.