1806ICT Programming Fundamentals

Booleans and if

1. Write C code that reads two integers, a and b from the keyboard. If a is 1 and b is in the range 1. . 100 OR if a is 0 and the b is not in the range 1..100 and is not in the range -20..-8 print 1. Otherwise print 0. All ranges are inclusive

Input	Output
1 50	1
1 105	0
0 50	0
0 200	1
0 5	0

2. Write C code that reads two integers from the keyboard. If the first integer is in the range 1. . 100 and the first integer is less than the second integer OR if the first integer is at least twice the second integer and the second integer is not in the range -8..16 (with the exception it can be zero) print 1. Otherwise print 0. All ranges are inclusive

Input	Output
10 50	1
20 5	0
100 20	1
30 20	0
2 0	1
16 5	0

3. Given 2 int values, print 1 if either of them is in the range 10..20 inclusive.

Input	Output
12 99	1
21 12	1
8 99	0

4. Write C code which, given an integer grade, prints "Pass" if the grade is greater than or equal to 50 but less than or equal to 100. If the grade is greater than or equal to 0 and less than 50 it prints "Failed" otherwise it prints "Illegal Grade".

Input	Output
10	Failed
23	Failed
50	Passed
78	Passed
128	Illegal Grade

5. You have a blue lottery ticket, with ints a, b, and c on it. This makes three pairs, which we'll call ab, bc and ac. Consider the sum of the numbers in each pair. If any pair sums to exactly 10, the result is 10. Otherwise if the ab sum is exactly 10 more than either bc or ac sums, the result is 5. Otherwise the result is 0.

Input	Output
9 1 0	10
9 2 0	0
6 1 4	10

6. Given an int n, print the absolute difference between n and 21, except print double the absolute difference if n is over 21.

Input	Output
19	2
10	11
21	0

7. Write a C program that calculates the deposit on a home loan as follows:

   Loan < $25,000, deposit = 5% of Loan value
   Loan >= $25,000 and < $50,000, deposit = $1,250 + 10% of loan over $25,000
   Loan >= $50,000 and < $100,000, deposit = $5,000 + 25% of loan over $50,000

Input	Output
12000	600
30000	1750
80000	12500

8. Given the user input of a point (x, y) and a circle (x, y, r), display whether the point is inside the circle.

Iterations

9. Write a program that takes an integer and displays each digit of the integer in English.

   Sample run:

Input	Output
0	zero

732	seven three two
-921	negative nine two one

10. Print out the two largest numbers in the set of integer numbers input into the program.

    Sample run:

Input	Output
11 25 43	Largest number = 43 Second largest number = 25
-2 -10 -5	Largest number = -2 Second largest number = -5
0	Largest number = 0 No second largest number
2 4 2 4 1	Largest number = 4 Second largest number = 2
1 2 2 2 2	Largest number = 2 Second largest number = 1

11. Given an integer number `X` and a value `n`, write a program that prints an output that is made up of the first `n` digits of the number `X`, followed by the first `n-1` digits of the number `X`, and so on. Your program must check that the value `n` is smaller than the number of digits in the number `X`.

    Sample run:

Input	Output
12345 3	123121
12345678 5	123451234123121
5 1	5
0 1	0
1234 9	You must enter a number that has more digits than `n`

12. Write a program that converts a binary number to its decimal equivalent.

    Sample run:

Input	Output
10010	18
110	6
0	0
1	1