Lab 3 - Expressions in C

1. Write a program to calculate the value $z = x^y$, for variables x and y of the type double. Hint: look up the function pow. ★
2. Divide 5 by 2 and print the result. First use the integer data type then the float data type. ★
3. Same as above, but try **incorrectly** printing the integer result using the `%f` format specifier and the float result using the `%d` format specifier. ★
4. Write a program to show the number of bytes the C/C++ primitive data types take in the computer memory. Hint: Use `sizeof()`. ★
5. Write a program to convert a number of seconds into hours, minutes and seconds. If the number of hours goes past 24 it should return to 0. ★
6. Write a program that reads 2 integers and shows the results of applying all the bitwise operations on them. Print the results using both `%d` and `%x`. ★
7. Write a program that reads a positive integer number in the range [1600, 4900]. Knowing that that number represents a year, check whether that year is bissextile or not. A year is bissextile if it is divisible by 4, except for years divisible by 100 but not by 400. ★★
8. Using conditional expressions (`a ? b : c`), write a program which reads a real value for x and then computes the value for the function: ★★

$$f(x) = \begin{cases} x^2 - 7x + 4, & x < -2 \\ 0, & x = -2 \\ x^2 + 5x - 2, & x > -2 \end{cases}$$

9. Write a program which reads a real number x, representing a measurement for an angle in Radians, and then converts it to degrees, minutes, and seconds. ★★
10. Write a program that reads the value of an angle expressed in degrees and calculates the values for its sine, cosine and tangent. ★★
11. Check if the cosine of a given angle is equal to 0. ★★★
12. Write a program which reads the integer numbers into variables a, b, c, d and outputs the highest value of fractions a/b and c/d. ★★
13. Write a program to convert Cartesian coordinates of a given point to polar coordinates. Conversion formulas: Converting between polar and Cartesian coordinates. ★★★

References

- Pb. 1-2, 4, 7-10, 12-13 [1]

[1] Iosif Ignat & Marius Joldoș. *CP Laboratory Guide 3: Expressions in C.*