

Assignment 2 - Reading from the Keyboard and Using Pointers

- The problems of this assignment must be solved in C.
- The TAs are grading solutions to the problems according to the following criteria:
<http://minds.jacobs-university.de/sites/default/files/uploads/teaching/CProgramming/Grading-Criteria-C.pdf>

Problem 2.1 *Reading from the keyboard* (1 point)

Presence assignment, due by 18:30 h today

Write a program which does the following:

1. reads two floats from the keyboard,
2. prints the sum of the two floats on the screen,
3. prints the difference of the two floats (the order should be second – first) on the screen,
4. prints the square of the first float on the screen,
5. reads two integers from the keyboard,
6. computes the sum and product of the two integers,
7. prints the sum, and the product of the integers on the screen,
8. reads two chars from the keyboard,
9. computes the sum and product of the two chars,
10. prints the sum and product of the chars as decimal values and as chars on the screen.

You can assume that the input will be correct.

Problem 2.2 *Decimal, octal and hexadecimal numbers* (1 point)

Presence assignment, due by 18:30 h today

Write a program which does the following:

1. reads an integer from the keyboard,
2. and prints the integer in decimal, octal and hexadecimal notation.

You can assume that the input will be correct.

Problem 2.3 *Time Calculation* (1 point)

Write a program where you can enter three values representing hours, minutes and seconds as input from the keyboard. Your program should compute and output by printing on the screen the total number of seconds corresponding to the total amount of time expressed by the three previous values.

You can assume that the input will be correct.

Problem 2.4 *Fahrenheit and Celsius* (1 point)

Write a program that converts Centigrades (also known as Celsius) to Fahrenheit. You should be able to enter a number from the keyboard representing the Celsius value, then the result should be computed and printed on the screen according to the following transformation formula:

$$F = \frac{9}{5}C + 32$$

You can assume that the input will be correct.

Problem 2.5 *Pointers and their content* (1 point)

Write a program which reads an integer variable `val` from the keyboard and prints the value on the screen. Then declare and initialize a pointer `ptr_val` to `val`, print the address contained in `ptr_val` on the screen, increment (i.e., add 1 to it) the value of `val` by using the pointer variable and print the modified value and the address on the screen as well.

You can assume that the input will be correct.

Problem 2.6 *Multiple pointers to same data* (1 point)

Write a program which reads two float variables `a` and `b` from the keyboard. Then declare and initialize three pointers `ptr1`, `ptr2` and `ptr3` such that `ptr1` and `ptr2` will both point to the variable `a` and `ptr3` will point to `b`. By using `printf` show that `ptr1` and `ptr2` contain the same memory address and `ptr3` contains a different address.

You can assume that the input will be correct.

How to submit your solutions

- Your source code should be properly indented and compile with `gcc` without any warnings (You can use `gcc -Wall -o program program.c`). Insert suitable comments (not on every line ...) to explain what your program does.
- Please name the programs according to the suggested filenames (they should match the description of the problem) in Grader.
Each program **must** include a comment on the top like the following:

```
/*  
    JTSK-320111  
    a2_p1.c  
    Firstname Lastname  
    myemail@jacobs-university.de  
*/
```

- You have to submit your solutions via *Grader* at <https://grader.eecs.jacobs-university.de>.
If there are problems (but **only** then) you can submit the programs by sending mail to `x.he@jacobs-university.de` **with a subject line that begins with JTSK-320111**.
It is important that you do begin your subject with the coursenummer, otherwise I might have problems to identify your submission.
- Please note, that after the deadline it will not be possible to submit any solutions. It is useless to send late solutions by mail, because they will not be accepted.

This assignment is due by Wednesday, September 20thst, 10:00 h.