Programming in C I, Group B
Jacobs University Bremen
Dr. Kinga Lipskoch
Xu He

Course: JTSK-320111
September 13th, 2018

Assignment 1 - Fixing and Writing Simple Programs

- The problems of this assignment must be solved in C.
- The TAs are grading solutions to the problems according to the following criteria: https://grader.eecs.jacobs-university.de/courses/320111/2018_2gB/Grading-Criteria-C.pdf

Problem 1.1 *Compute division* (1 point)

Presence assignment, due by 18:30 h today **Graded manually**

Fix the program below such that it prints the correct result. Why is the result 0.000? Write your answer and explanations within comments.

```
#include <stdio.h>

int main() {
    double result; /* The result of our calculation */
    result = (3 + 1) / 5;
    printf("The value of 4/5 is %lf\n", result);
    return 0;
}
```

Problem 1.2 *Wrong output* (1 point)

Presence assignment, due by 18:30 h today **Graded manually**

Fix the program below such that it prints the correct value. Why does the program print "`The result is -1073745604`"? (Values will vary). Write your answer and explanations within comments.

```
#include <stdio.h>

int main() {
    int result; /* The result of our calculation */
    result = (2 + 7) * 9 / 3;
    printf("The result is %d\n");
    return 0;
}
```

Problem 1.3 *A compile error* (1 point)

Due by Tuesday, September 18th, 10:00 h **Graded manually**

You will get compiler errors, when you try to compile the example code given below.
Read the error messages that the compiler produces and fix the errors such that your source code compiles successfully. Then fix the program to print the correct result. Explain within comments the reason of the errors and describe your fixes.

```
include <stdio.h>

int main() {
    float result; /* The result of the division */
    int a = 5;
    int b = 13.5;
    result = a / b;
    printf("The result is %d\n", result);
    return 0;
}
```

Problem 1.4 *Simple arithmetics* (1 point)

Due by Tuesday, September 18th, 10:00 h **Graded automatically with testcases only**

Write a program which does the following:

1. assigns 17 to `x` and 4 to `y`,
2. prints the values of `x` and `y`,
3. computes the sum of `x` and `y` and prints the result,
4. computes the product of `x` and `y` and prints the result,
5. computes the difference of `x` and `y` (`x` minus `y`) and prints the result,
6. computes the division of `x` and `y` (`x` divided by `y`) and prints the result (the result should be a `float`),
7. computes the remainder of the division of `x` and `y` in this order and prints the result.

Your solution has to satisfy the requirements from the problem description and has to pass the following testcase and potentially other testcases which are uploaded. All characters are relevant for passing testcases including newlines and spaces.

Testcase 1.4: input

Testcase 1.4: output

```
x=17
y=4
sum=21
product=68
difference=13
division=4.250000
remainder of division=1
```

Problem 1.5 *Using `printf` for multiple data types and conversions* (1 point)

Due by Tuesday, September 18th, 10:00 h **Graded automatically with testcases only**

Write a program which:

1. declares and initializes an integer variable `x` with 2138, and prints the value of `x` over 9 places,
2. declares and initializes a float variable `y` with -52.358925, and prints the value of `y` over 11 places and with a floating point precision of 5,
3. declares and initializes a char variable `z` with 'G', and prints the character on the screen,
4. declares and initializes a double variable `u` with 61.295339687, and prints the value of `u` with a floating point precision of 7.

Your solution has to satisfy the requirements from the problem description and has to pass the following testcase and potentially other testcases which are uploaded. All characters are relevant for passing testcases including newlines and spaces.

Testcase 1.5: input

Testcase 1.5: output

```
x=     2138
y=  -52.35892
z=G
u=61.2953397
```

Problem 1.6 *Printing a char as character and as decimal value* (1 point)

Due by Tuesday, September 18th, 10:00 h **Graded manually**

Write a program which declares and initializes a char variable `c` with 'F' and prints on the screen the third character (within the alphabet) after `c` as a character and as the corresponding ASCII code using only arithmetic operations.

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.
- 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
   a1_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 coursenumber, otherwise I might have problems to identify your submission.
- 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 Tuesday, September 18th, 10:00 h.