Exercise 7

1. Open the file `h07t01.c`.
   a) Comment all commands related to pointers.
   b) Think what the program would print. Answer the questions given in the file. Check your answers by compiling and executing the program.
   c) Execute it in the debug mode and watch the values of the variables.
2. Write a program where you initialize a `double` array using a pointer which goes through all memory addresses reserved for the array.
3. Find out how big (how many bytes) is a `double` type variable. Do this by creating an array and calculating the difference of the memory addresses of two consecutive elements.
4. In the header file `stdio.h` there is a function called `gets`, which can be used to read a string consisting of multiple words:

   ```
   char text[N];
   gets(text);
   ```

   Using the `gets` function, write a program which asks the users name and prints it on the screen. NOTE: You must create a big enough character array. If the array is too small, `gets` will write the input character who knows where.
5. A safer way to read input is one character at a time, for example with the `getchar` function (in the header file `stdio.h`):

   ```
   char c;
   c=getchar();
   ```

   Using the `getchar` function, write a program which reads one line of text and creates a character array of it.

   Hint: Use some loop structure. The condition for the loop is that the character given by the user is not the linebreak character '`\n`'.
6. The function `sprintf` (in the header file `stdio.h`) can be used to create strings where there are values of variables inside. This is convenient in for example naming output files. The function works as follows:

   ```
   char str[N];
   int n,m;
   sprintf(str,"%i+%i equals %i",n,m,n+m);
   ```

Write a program which asks the users name and age, and creates a string containing the data, for example "`John Doe, 22 years`".

7. In the header file `string.h` there are a lot of functions for manipulating strings. Find out how each of the following functions works, and do the given task.

   strlen. Write a program which asks the users name and count the number of letters in the name.

   strcpy. Write a program which creates a copy of the string given by the user.

   strcmp. Write a program which riddles "Which school subject do I think is the best?". The program ends when the user guesses correct.