RECITATION 10

Q1. Write a program without arrays that:

- declares 3 variables of the type double in the main function,
- reads all 3 variables with one function call to the function ReadValues,
- prints the values of the 3 variables in the main function.

Q2. Write a program to swap two numbers. The first number is stored in the variable number1 and the second in the variable number2. After the swap the variable number1 contains the second number and number2 contains the first number. Use functions: Read, Swap, Print. Do not use arrays.

Q3. Write a program that converts a number of seconds into a number of hours, minutes and seconds. Reading the number of seconds and printing the result is done in the main function. The calculations are done in a separate function. No arrays are to be used.

Q4. Write a program that reads the temperatures of a full week, finds the minimum and maximum temperatures and prints them together with all entered temperatures. Print the temperatures as follows:

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Day	5.0	5.5	7.0	6.0	7.5	8.0	8.5
Night	-1.5	-0.5	0.0	-1.0	0.0	1.0	1.5

Print also minimum and maximum temperatures of day and night together with the day that temperature was measured:

Min:

Night: Mon = -1.5

Day: Mon = 5.0

Max:

Night: Sun = 1.5

Day: Sun = 8.5

The temperatures are stored in a 2D array with row 0 for the temperatures measured during the day and row 1 for the temperatures measured during the night. The names of the days are stored in a separate array (you cannot store numbers and text in the

same array). Use 3 functions: Read, Print and Calculate. Pass the indexes of the minimum and maximum temperatures for day and night by reference.

Q5. Write the function print_string to finalize the next program. The function print_string prints a string, received as argument, character by character using the function putchar().

```
#include <stdio.h>
#include <string.h>
#define MAXSTRING 100

void print_string(char *c);

int main(void)
{
    char s1[MAXSTRING], s2[MAXSTRING];

    strcpy(s1, "Mary, Mary, quite contrary.\n");
    strcpy(s2, "How does your garden grow?\n");

    print_string(s1);
    print_string(s2);
    strcat(s1, s2);
    print_string(s1);
}
```

Q6. Write a program that reads a word and converts it as follows:

- The first 2 characters are printed. Ex: "qwerty" => print qw.
- The first and second character are compared. The largest one is printed. Ex: q < w => print w as third letter.
- Now, compare the second and third character and again print the largest. Ex: w > e => print w as forth letter.
- Repeat until the word is finished.

Once the conversion is finished, the program prints also the alphabetically smallest and largest letter.

The function main contains:

- asking the question "again?" and reading a 0 or 1 as answer.
- printing the largest and smallest letter.

The function Read takes care of:

- reading a word. Make sure only words of 2 or more characters can be entered.

The function Print takes care of:

- determining the smallest and largest letter and passing them to the main program with pointers.
- converting and printing the word.

```
Enter a word or a series of letters:
qwerty

qwwwrty
largest = y and smallest = e

again? (1=yes, 0=no): 1
Enter a word or a series of letters:
beverage

beevvrrgg
largest = v and smallest = b

again? (1=yes, 0=no): 0
```

For the example “beverage”, the smallest character should be ‘a’, not ‘b’.

Q7. Write a program that prints the tables of multiplication of an integer number entered by the user up to a limit that is also entered by the user. Keep on repeating the program until 0 0 is entered. Use following functions:

- Read: read 2 integers (number and limit)
- CalcPrint: prints the table of multiplication and calculates the sum of the odd and even numbers
- main: calls the functions Read and CalcPrint and prints the sum of the odd and even numbers

No arrays can be used.

```
enter the number you want to use for the table of
multiplication:
5
enter the limit:
32

5
10
15
20
25
30

the sum of the even numbers is 60
the sum of the odd numbers is 45

enter the number you want to use for the table of
multiplication:
0
enter the limit:
0
Thanks!
```

Q8. Write a program that performs a mathematical computation on 2 numbers entered by the user. The numbers are read in the function Read (do not use arrays). The main function:

- calls the function Read.
- asks the user to choose an operator. Do this with a menu. Make sure only valid inputs are allowed.
- uses a function pointer that points to the correct function (use a switch statement to select the correct function).
- prints the result**.**

```
Enter 2 integer numbers: 10 5

Choose an operand:
0   addition
1   subtraction
2   multiplication
3   division
4

Choose an operand:
0   addition
1   subtraction
2   multiplication
3   division
0
The result of this operation is: 15
```

Q9. Repeat the previous exercise but this time:

- Make an array of function pointers where the function pointer stored at index 0 points to addition, at index 1 to subtraction, …
- Write a separate function “Choose” that returns the user’s choice to the main program.
- Make sure the integer returned by the function Choose is equal to the index corresponding to the correct function pointer.