Coding problems

Problem 1 - Even or odd?

- For a given integer N, check if the number is even or odd

EXAMPLES

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter an integer: 1
ODD
```

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter an integer: 6
EVEN
```

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter an integer: 22
EVEN
```

Problem 2 - Cola machine

- Write a program that presents the user w/ a choice of your 5 favorite beverages (Coke, Water, Sprite, … , Whatever).
- Then allow the user to choose a beverage by entering a number 1-5.
- Output which beverage they chose
- In first version of the program use if-else statements and in the second version use switch statement

EXAMPLES

```
[mpavin@Jozo test]$ ./test
        1 - Water
        2 - Coca cola
        3 - Sprite
        4 - Iced Tea
Select a drink: 4
You selected iced tea!
```

```
[mpavin@Jozo test]$ ./test
        1 - Water
        2 - Coca cola
        3 - Sprite
        4 - Iced Tea
Select a drink: 3
You selected Sprite!
```

```
[mpavin@Jozo test]$ ./test
        1 - Water
        2 - Coca cola
        3 - Sprite
        4 - Iced Tea
Select a drink: 1
You selected water!
```

Problem 3 - Compare two numbers

- Write a program which takes two numbers and returns the larger one.

EXAMPLES

```
[mpavin@Jozo test]$ ./test
Enter first number: 5
Enter second number: 6
6 is larger than 5
```

```
[mpavin@Jozo test]$ ./test
Enter first number: 11.2
Enter second number: 3
11.2 is larger than 3
```

```
[mpavin@Jozo test]$ ./test
Enter first number: 99
Enter second number: 99
99 is equal to 99
```

Problem 4 - Sum

- Write a program which takes a non-negative integer N as an input and calculates the sum:

$$S_N = \sum_{k=0}^{N} k$$

EXAMPLES

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter non-negative integer: 0
Sum = 0
[mpavin@mpavin-desktop TEST]$
```

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter non-negative integer: 5
Sum = 15
[mpavin@mpavin-desktop TEST]$
```

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter non-negative integer: 10
Sum = 55
[mpavin@mpavin-desktop TEST]$
```

Problem 5 - Integrate polynomials

- Write a program which integrates polynomials of degree N ≤ 10 between 0 and 1
- Do the integration in a separate function which is called from main

$$f_N(x) = \sum_{k=0}^{N} a_k x^k$$

EXAMPLES

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter a polynomial degree (N<=10): 1
Enter a parameter a0: 1
Enter a parameter a1: 2
Integral = 2
```

```
[mpavin@mpavin-desktop TEST]$ ./test
Enter a polynomial degree (N<=10): 11
N must be positive or <= 10
```

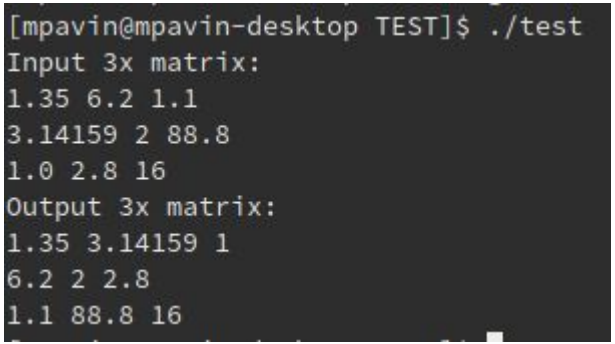
```
[mpavin@mpavin-desktop TEST]$ ./test
Enter a polynomial degree (N<=10): 5
Enter a parameter a0: 1.1
Enter a parameter a1: 5.75
Enter a parameter a2: 6
Enter a parameter a3: 2
Enter a parameter a4: 3.14
Enter a parameter a5: 1.4
Integral = 7.33633
```

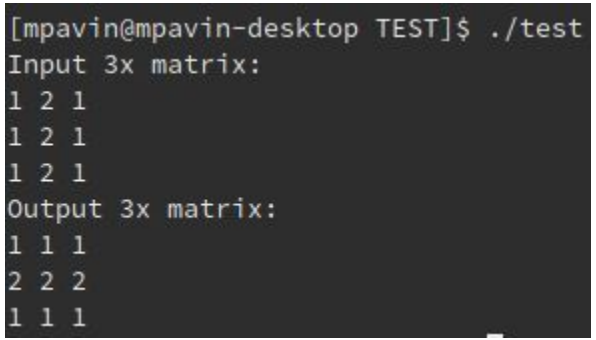
```
[mpavin@mpavin-desktop TEST]$ ./test
Enter a polynomial degree (N<=10): 3
Enter a parameter a0: -5
Enter a parameter a1: 1.6
Enter a parameter a2: 1
Enter a parameter a3: 0.2
Integral = -3.81667
```

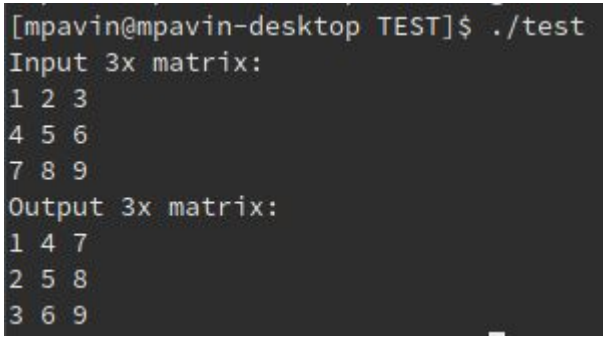
Problem 6 - Transpose 3x3 matrix

- Write a program which takes 3x3 matrix as an input and prints transposed matrix in the output

EXAMPLES







Problem 7 - Pointers

- Define an integer array of size 5
- Print the address of the first element
- Print the address of the second element
- Print the address of the last element
- Evaluate the difference between addresses of
  - first and second element
  - first and last element
- **What can you conclude from this exercise?**