Lab #1: Getting started with Julia

Abdelbacet Mhamdi
Senior-lecturer, Dept. of EE
ISET Bizerte — Tunisia
a-mhamdi

I. Exercises

The following exercises will help you practice various aspects of Julia, such as functions, loops, conditionals, arrays, and file processing. Remember to break down the exercises into smaller steps and test your code along the way. You are required to carry out this lab using:

Exo 1: Fibonacci Sequence

Write a function that generates the Fibonacci sequence[1] up to a given number n.

$F_0 = 0$
$F_1 = 1$
$F_n = F_{n-1} + F_{n-2} \quad \forall n \geq 2$

```
# WRITE YOUR CODE HERE
```

Display the Fibonacci sequence if $n = 16$.

Exo 2: Prime Number

Write a function that determines if a given number n is prime[2]. The function should return true if the number is prime and false otherwise.

```
# WRITE YOUR CODE HERE
```

Give the list of prime numbers less than 100.

Exo 3: Palindrome

Write a function that checks if a given string is a palindrome[3]. The function should return true if the string is a palindrome and false otherwise.

```
# WRITE YOUR CODE HERE
```

Check the sentence “Was it a car or a cat I saw?”. Disregard spaces and punctuation marks.

Exo 4: Matrix Operation

Implement functions to perform basic matrix operations such as matrix addition, matrix multiplication, and determinant calculation.

```
# WRITE YOUR CODE HERE
```

Test your functions with the following matrices

```
A = [1 2; 3 4]
B = [5 6; 7 8]
```

Exo 5: File Processing

Write a program that reads a text file and counts the occurrences of each word. Display the word count for each unique word in the file.

```
# WRITE YOUR CODE HERE
```

Redirect the output of ‘man ls’ command to a dummy file and display the word count for ‘ls’

```
man ls > dummy
```

[1] The Fibonacci sequence starts with 0 and 1, and each subsequent number is the sum of the two preceding numbers.

[2] A prime number is a number greater than 1 that has no positive divisors other than 1 and itself.

[3] A palindrome is a word, phrase, number, or other sequence of characters that reads the same forward and backward.