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❑ ACTIVITY 1 – Caesar style encryption

- Caesar encryption consists of taking each letter of a message and moving it in the alphabet the number that gives a key. For example, if key=2 , the letter **A** scrolls 2, it will become **C**.
- Taking into account that Caesar encryption works with a full alphabet and by displacement (in the example above the letter **Z** is usually converted to **B**), create a page that asks the user for a text and a key and writes the same text but moving the characters in the Unicode table the number that indicates the key.

❑ ACTIVITY 2 – Polyalphabetic style encryption

- It is about improving the previous encryption in which each letter always corresponds to the same encrypted letter (which facilitates its decryption)
- That is why we will make a similar web application, but now as a key we will ask for a text to encrypt that must contain numbers. The key will be encrypted cyclically:
- Example:

message:	This is the message
Key	12345
Encrypted message:	Ujlw%ju#xmf"pixtcji

- The encrypted message is formed that way:
  - T+1=U
  - h+2=j
  - i+3=l
  - s+4=w
  - (white space)+5=%
  - i+1=j
  - s+2=u
  - etc.

❑ ACTIVITY 3 – Primitive lottery

- Create a web application that displays fifty combinations to play the primitive lottery.
- The combinations are six numbers from 1 to 49, but keep in mind that you cannot repeat the numbers.

❑ ACTIVITY 4 – Number frequencies

- We want to make an application that allows us to check to what extent the Math.random function is really random.
- To do this, we will calculate 10,000 times random numbers from 1 to 10.
- We will show on a web page how often each number has come out.
- Example of result:

Frequencies

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- Number 1: 1016
- Number 2: 1019
- Number 3: 1059
- Number 4: 992
- Number 5: 995
- Number 6: 969
- Number 7: 977
- Number 8: 1003
- Number 9: 977
- Number 10: 993

❑ **ACTIVITY 5 – Password validation**

- We want to make a web application that asks the user for a name and password. We will ask for both data using text input boxes (although it is not the best method)
- We assume that the user is entering the information to register in some service. The password will be visible so we will not ask to repeat it.
- The username may only be made up of lowercase letters and numbers, otherwise we will indicate the error and ask for the name again.
- What we will validate about the password is that it has at least one element of the following:
  - ✓ A capital letter
  - ✓ A lowercase letter
  - ✓ A number
  - ✓ A character that is neither letter nor number
- Although it would be easier to solve this practice with regular expressions (we will see them later) we will do it without them as an opportunity to practice with strings.
- If the password does not comply with what is indicated in the previous point, we will ask the user to indicate it again. When the password is right, we will indicate with a message that the information has been stored properly.
- In the event of any cancellation in the boxes, the application terminates. We will indicate this with a message.

❑ **ACTIVITY 6 – Display asterisks for an array**

- Generate an array with 20 random numbers from 1 to 50.
- Run through the array showing as many asterisks as indicated in the number of each element.
- Example of result (with 9 elements) with the array:

2	3	5	7	4	6	3	2	9

Result

```
**
***
*****
*******
```

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```
****
******
***
**
*********
```

- ❑ **ACTIVITY 7 – Palindromes**
  - Create a web application that reads a text and indicates whether it is a palindrome.
  - A palindrome is a text that reads just as well from right to left as it does from left to right.
  - Examples of palindromes:
    - A Santa dog lived as a devil god at NASA
    - No lemon, no melon!
    - UFO tofu
    - Dennis sinned
  - Keep in mind that in order for palindromes to be considered well, punctuation marks (spaces, questions, commas, periods, etc.) are also ignored, tildes and umlauts(¨) are also ignored (the character **á** is considered the same as the character **a**) and it is not case sensitive.

- ❑ **ACTIVITY 8 – Average numbers**
  - Create a web application that continuously asks for numbers until the user enters the number zero.
  - At the end it will indicate the average of the numbers entered
  - If at any time it is not a number what the user types, it is asked again.
  - If the user cancels any reading box, the program terminates and it is indicated that the user has canceled and the average will not be displayed.

- ❑ **ACTIVITY 9 – Group students**
  - Create a web application that reads the names of the so-called students (anything entered will be valid)
  - The introduction of students ends when we indicate the word **end**.
  - Names cannot be repeated, if it is repeated it is indicated that the name is repeated and another one is requested.
  - The application will group users 3 by 3 into random groups.
  - If the number of students is not a multiple of three, the remaining students move one by one randomly in the groups that we indicate.
  - Example of result:
    - Grupo 1: David, Toni, Edison
    - Group 2: Sandra, Isabel, Jaume, Carlos
    - Group 3: Ricardo, Vicent, Joan
    - Group 4: Raúl, Manel, Juan, Alejandro
  - There are two groups of 4 students as there are more students, it is important that the 2 students are not placed in the same group forming a group of 5.

OPTIONAL

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- **ACTIVITY10 – Sinking the fleet**
  - Create a program that draws on the screen the board of the game Ship War (Sink the Fleet)
  - You have to randomly draw on the board 1 ship of size 4 (aircraft carrier), 3 of size 3 (battleships), 3 of size 2 (destroyers) and 2 of size 1 (frigates).
  - The board will be 10 by 10.
  - Boats cannot overlap or touch and can be drawn both horizontally and vertically.
  - The boats will be randomly placed on the board automatically by the application
  - Example of possible outcome