ASSIGNMENT #4

SUBJECT & BASIC INFORMATION

- Writing down a C++ program that performs Vigenere encryption/decription using the English alphabet for an entered password and message entered from the keyboard
  - The program has two main functionality: encryption and decription
  - The program encrypts/decripts the message using the following Vigenere Cipher table given below:

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	**O**	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	**K**	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	**W**	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

CALCULATION OF THE ENCYPTED MESSAGE FOR AN EXAMPLE PASSWORD AND MESSAGE

- Rows of the table represent the letters of the password and colums of the table reprent the letters of the message
- First row of the matrix is the letters of the English alphabet and the other rows should be assgined after calculation depending on the rule of the Vigenere table.
- Let the message be “SAKARYA UNIVERSITY” and password “SWE”.
- For example, for the first three letters of the message, the encrypted message is “KWO…”
- If the length of the password is shorter than the message, it is repeated over and over throughout the message
- If the message has space character(s), these char(s) is/are not be considered.

SAMPLE SCREEN OUTPUT

```
ENTER A PASSWORD...: SWE
ENTER A MESSAGE....:SAKARYA UNIVERSITY
-----------------------------------------
PASSWORD             : SWE
MESSAGE              : SAKARYA UNIVERSITY
-----------------------------------------
ENCRYPTED MESSAJE    : SWOSNCS QRARIJOMLU
DECRYPTED MESSAGE    : SAKARYA UNIVERSITY
-----------------------------------------
```

REQUIREMENTS

- Define a **message** variable and get the value of it from the user.
  - Enter a message that only contains the letters of the alphabet and the space character
- Define a **password** variable and get the value of it from the user.
  - Enter a password that only contains the letters of the alphabet
- Write a function named **encrypt()**
  - This function gets the entered message and the password
  - This function calculated the encrypted message
  - This function returns the encrypted message
- Write a function named **decrypt()**
  - This function gets the encrypted message and the entered password
  - This function calculated the decrypted message
  - This function returns the decrypted message

RULES & EVALUATION

- Using a **goto** statement is strictly prohibited.
- Each C++ file should include this comment lines below at the beginning of the C++ file

```
//**********************************************************************
//**                                                                  **
//**         STUDENT NAME.............:                              **
//**         STUDENT NUMBER...........:                              **
//**********************************************************************
```

- You should compile your codes with MingGW or GCC. (NOTE: If you use another compiler, please test your codes with these compilers before uploading your homework on system)
- **Deadline:** Control SABIS system
- A report should be prepared for each assignment
  - First page of the report should be a cover page including student information (name, surname, number, lecturer, course name, ...)
  - The content of the assignment (a brief explanation of your program) should be included after the cover page
  - At the end of the report, there should be an **'honor code'** signed by yourself.
- You should upload only your C++ file (.cpp file) and your report (in pdf format) together before deadline.
- Evaluation Criteria
  - Comment lines (student information, explaining operations like variable names, if statements, loops, etc.)
  - Obeying the variable declaration rules
  - Being readable (intendation, comments, etc.)
  - Correct compilation of the code
  - Reporting (cover page, content, honor code, etc.)
  - ...