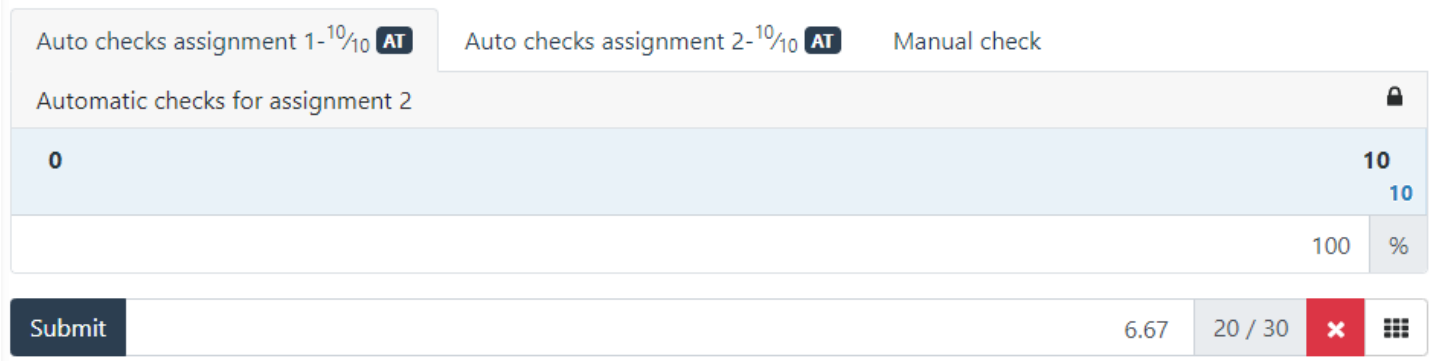
Week 3 assignments

When creating the program code, you must apply the following basic principles:

- create a separate project for each assignment;
- use name ‘assignment1’, ‘assignment2’, etcetera for the projects;
- create one solution for each week containing the projects for that week;
- make sure the output of your programs are the same as the given screenshots;

CodeGrade auto checks

Make sure all CodeGrade auto checks pass (10/10) for your assignments. The manual check will be done by the practical teacher.



Assignment 1 – Grade list

In this assignment an application is made for displaying a grade list. A grade list contains courses (like "Programming 2") and each course has a theory grade and a practical grade.

class Course and enum PracticalGrade

a) Create a `class Course` with the fields:
- Name (name of the course: string)
- Grade (theory grade: int)
- Practical (practical grade: enumeration)

The practical grade can have one the following values: None, Absent, Insufficient, Sufficient and Good.
→ Create an `enum PracticalGrade` for this.

b) Create the following methods to read/display a PracticalGrade and to read/display a Course:

```
PracticalGrade ReadPracticalGrade(string question)
void DisplayPracticalGrade(PracticalGrade practical)
Course ReadCourse(string question)
void DisplayCourse(Course course)
```

→ Use the ReadInt and ReadString methods we've created in week 1 (copy these 3 methods).
→ Check the Read/Display methods by calling them from the `Start` method.

c) In the Start method declare a list of courses:

```
List<Course> gradeList;
```

→ Fill the grade list with 3 courses using method: `List<Course> ReadGradeList(int nrOfCourses)`.
→ Display the grade list on screen using method: `void DisplayGradeList(List<Course> gradeList)`.

d) Add the following methods to class `Course`:

```
public bool Passed()
public bool CumLaude()
```

A course is passed if the grade is 55 or higher and the practical grade is Sufficient or Good.
A course is passed Cum Laude if the grade is 80 or higher and the practical grade is Good.

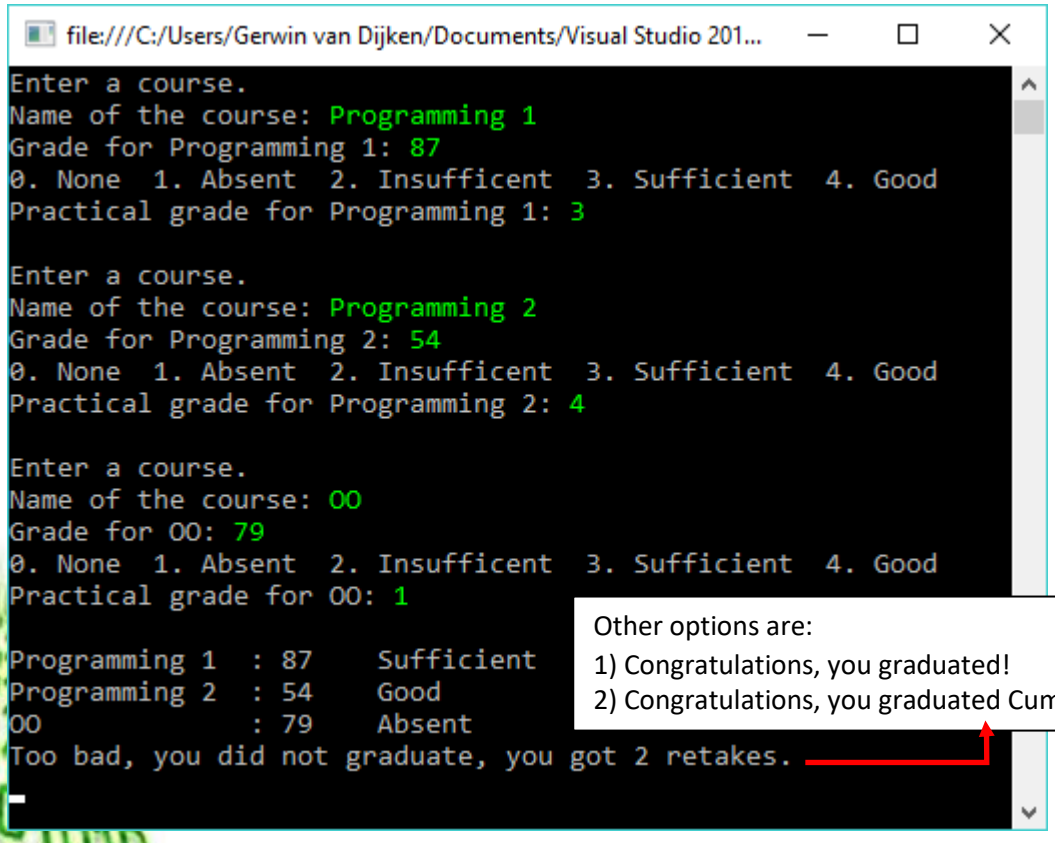
e) Now add code to method `DisplayGradeList` to determine if the student has graduated or not. If the student did not graduate then display the number of courses that need a retake. Also display if the student graduated Cum Laude.

ReadCourse

ReadCourse

ReadCourse

DisplayGradeList



Assignment 2 – Hangman

class HangmanGame

The purpose of the game Hangman is to guess a secret word. Two essential parts of the game are the secret word and the guessed word so far (containing the guessed letters). See www.playhangman.com.

a) For the game Hangman we create a `class HangmanGame`, containing two strings: `secretWord` and `guessedWord`.
Add to class HangmanGame a method with signature:

```
public void Init(string secretWord)
```

This method stores the secret word, and fills the guessed word with dots, as many dots as the number of characters in the secret word.
So, if the secret word is `"backdoor"` then the guessed word will be filled with 8 dots: `"........"`.
Later (in this assignment) we shall add more methods to the class HangmanGame.
→ Test your class with the following code (in the `Start` method):

```
HangmanGame hangman = new HangmanGame();
hangman.Init("backdoor");
Console.WriteLine("The secret word is: " + hangman.secretWord);
Console.WriteLine("The guessed word is: " + hangman.guessedWord);
```

Generating a random word

b) Implement a method (in Program.cs) with signature:

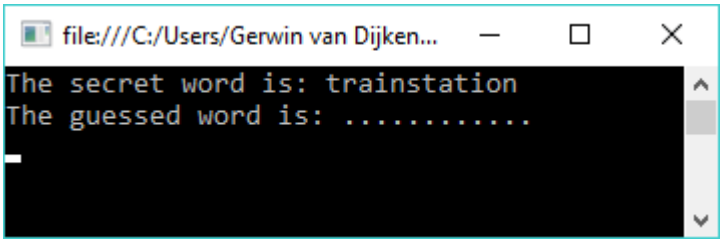
```
List<string> ListOfWords()
```

This method returns a list of 20 hardcoded words. One of these words will become the secret word for the hangman game. Use the 20 words from textfile “ListOfWords.txt”on Moodle.
→ Declare in the `Start` method a `List<string> words` and fill this list using method `ListOfWords`.

c) Implement a method (in Program.cs) with signature:

```
string SelectWord(List<string> words)
```

This method chooses a random word from the list of words.
→ Call this method `SelectWord` from the `Start` method and pass (as a parameter) the list of words. The selected word will serve as secret word.
→ Display (as a test) the selected word in the `Start` method by using the given code (see border above) again. Replace “backdoor” with the selected word. Of course the user must not see this word...



Reading and displaying letters

d) Implement a method (in Program.cs) with signature:

```
bool PlayHangman(HangmanGame hangman)
```

This method returns `true` if the secret word has been guessed by the user, otherwise it returns `false`.
To be able to remember the entered letters we'll create a list of char (in method `PlayHangman`):

```
List<char> enteredLetters;
```

For now, this method returns `true`.
→ Call the method `PlayHangman` from the `Start`.
For now we will use method `PlayHangman` to test other methods. At the end of the assignment we will finish the implementation of this method.

e) Create a method (in Program.cs) with signature:

```
void DisplayWord(string word)
```

This method displays the given word with spaces between the letters. We will use this method everytime we need to display the guessed word.
→ Test the method by calling it from method `PlayHangman`.
(display the guessed word of Hangman)

f) Create a method (in Program.cs):

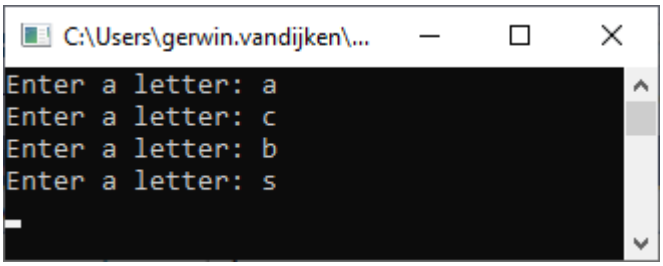
```
void DisplayLetters(List<char> letters)
```

This method displays the given letters separated by spaces.
→ Test the method by calling it from method `PlayHangman`.
(display the list with entered letters, add some dummy letters to it)

g) Create a method (in Program.cs):

```
char ReadLetter(List<char> blacklistLetters)
```

This method reads a letter until this letter is not in the blacklist. To check this use `blacklistLetters.Contains(letter)`.
→ Test the method by calling it from method `PlayHangman`, and add the returned letter to the list with entered letters.
(the screenshot to the right shows the output of one call to ReadLetter, with a blacklist containing the letters 'a', 'b', and 'c')



h) Add a method to `class HangmanGame`:

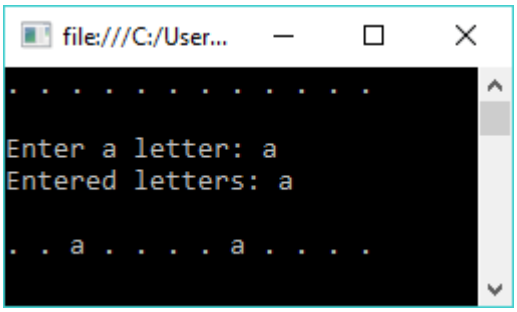
```
public bool ContainsLetter(char letter)
```

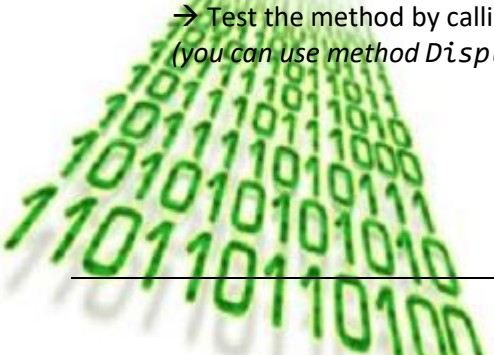
This method checks if the secret word contains the given letter, and returns `true` if it does, `false` otherwise.

i) Add a method to `class HangmanGame`:

```
public bool ProcessLetter(char letter)
```

This method changes the guessed word by putting the given letter in the correct places.
→ Test the method by calling it from method `PlayHangman`.
(you can use method `DisplayWord` to see the result)





Guessing the word

The user has (max) 8 attempts to guess the hangman word. The count of remaining attempts should only decrease when the user enters a letter that is not present in the hangman word. The program stops when the user has guessed the word, or when the user has no more attempts left.

j) Add a method to `class HangmanGame`:

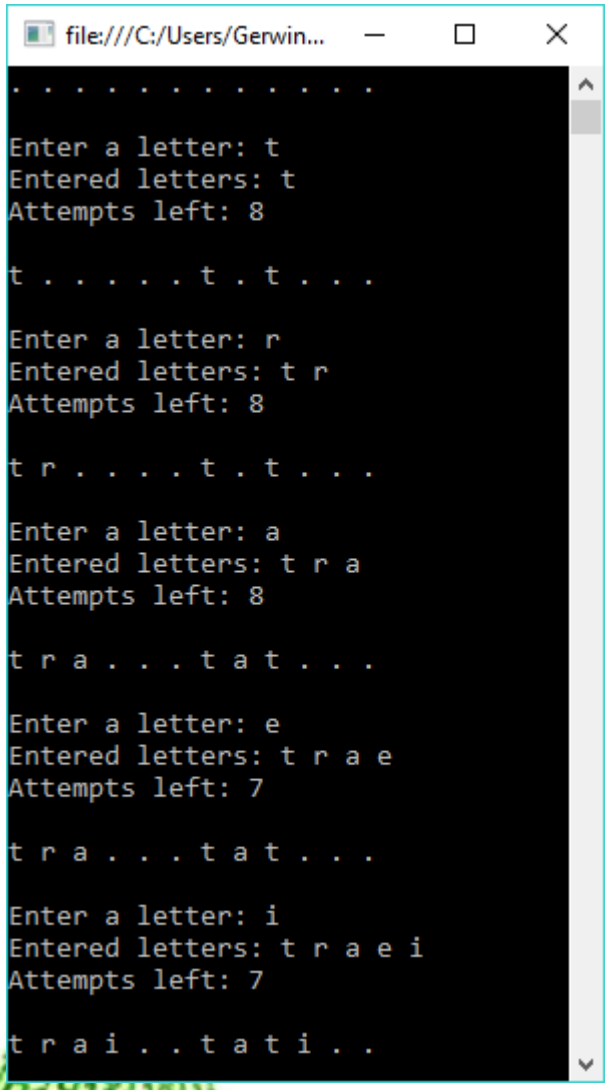
```
public bool IsGuessed()
```

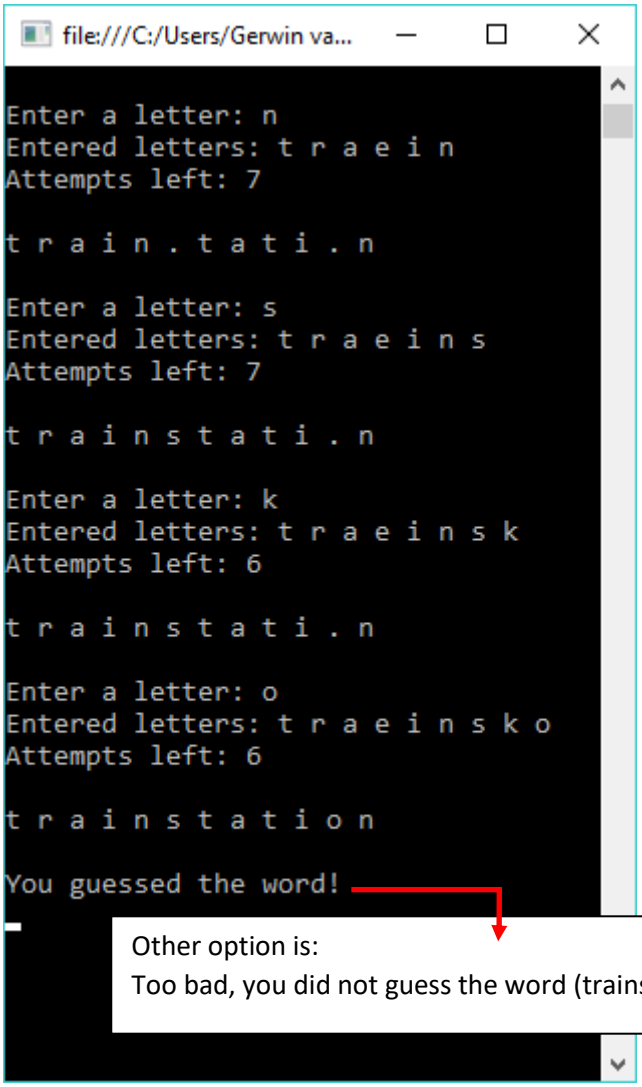
This method returns `true` if the guessed word is the same as the secret word, `false` otherwise.

k) Now we finally going to finish the implementation of the method `PlayHangman`.
→ Create a loop in method `PlayHangman` in which:

- the user can enter a new letter
- this letter is added to the list of entered letters
- the entered letters are shown
- the new letter is processed (if it is present in the hangman word)
- the attempts left is shown
- the guessed word is shown

Of course you must use the methods you created in the previous sections.
→ Make sure the loop stops when the word is guessed or the number of remaining attempts has becomes 0.
→ The `PlayHangman` method returns `true` if the word is guessed, `false` otherwise. The `Start` method displays an appropiate message. If the user did not guess the word, then display the word.





Other option is:
Too bad, you did not guess the word (trainstation)

Save your code, later we will extend this assignment
by reading words from a file.