

# Assignment 4: Morse code decoder

## ECED 3401 - Systems Analysis

Department of Electrical and Computer Engineering

Dalhousie University

## Background

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Morse code is a telegraph code in which letters, numbers, and some punctuation symbols are represented by sequences of ‘.’ (dits) and ‘-’ (dahs). It was developed by Samuel Morse for transmitting telegraph messages. He erected the first telegraph line between Washington and Baltimore in 1844.

You are to write a Morse code decoder. Your solution should be able to take any valid Morse code message consisting of dits and dahs, and decode it into the equivalent alphabetic character, number, or punctuation marks.

## Input and Output

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Your program is to accept one *or more* input files containing Morse code and decode the Morse code into text and write the output to the screen.

Morse encodings within a word are separated by a single space. Spaces between words and new lines are separated by three spaces. The encoding software accepts lower case characters and treats them as upper case. For a complete list of the characters to be supported, see the last page of the assignment.

## Sample Input and Output

```
-- -- . . . . . - . - - - . . . . . - - . . - . - . - . - . - .  
. - . - . . . . . - . - - - . . . . . - - . . - . - . - . - . - .  
- . . - . . . - . - . - . . . . . - . - . - . - . - . - . - .  
. . - - - . . - . - . . . - . - . - . . - . - . - . - . - .  
. - . - . - . . - . . . . . - . - . - . - . - . - . - .  
- . . - . - . . . - . . . - . - . . - - . . - . - . - . - .  
- . - . . . - . . - . - . - . - . - . - . - . - . - . - . - .  
. . - . . . . - . - . - . - . - .
```

```
MORSE CODE IS A TELEGRAPH CODE IN WHICH LETTERS, NUMBERS, AND SOME  
PUNCTUATION CHARACTERS ARE REPRESENTED BY STRINGS OF '.' (DITS) AND '-'  
' (DAHS).
```

```
. - - . . - . - . . . - . - . . . . - - - . - . - - . - . -  
. - . . . - . - . - . - . - . - . - . - .
```

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

```
----- .----- . .- - - . . . - . . . . - . . . . - - . . - - .
```

```
0123456789
```



If you are having difficulties with this assignment or any part of the course, please contact Dr. Hughes or one of the course TAs.

The Morse characters that can be encoded are listed on the next page.

This assignment is worth 3% of your overall grade.

Late assignments will be penalized half-a-point per day starting on 10 October 2022 at midnight.

A Morse encoder (text input file to Morse) is available on the course Teams website (there will be malware warnings, they can be ignored):

Channels > General > Files > Class Materials

Late assignments will not be accepted once a solution has been discussed in class.

## International Morse Code

The following sections list alphabetic, numeric, and punctuation encoding for western characters to Morse code. Tables are taken from [International Morse Code](#).

### Alphabetic

Symbol	Morse
A	. -
B	- . . .
C	- . - .
D	- . .
E	.
F	. . - .
G	- - .
H	. . . .
I	. .
J	. - - -
K	- . -
L	. - . .
M	- -

Symbol	Morse
N	- .
O	- - -
P	. - - .
Q	- - . -
R	. - .
S	. . .
T	-
U	. . -
V	. . . -
W	. - -
X	- . . -
Y	- . - -
Z	- - . .

### Numeric

Symbol	Morse
0	- - - - -
1	. - - - -
2	. . - - -
3	. . . - -
4	. . . . -
5	. . . . .
6	- . . . .
7	- - . . .
8	- - - . .
9	- - - - .

### Punctuation

Symbol	Morse
&	. - ...
(	- . - - .
)	- . - - . -
+	. - . - .
=	- . . . -
!	- . - . - -
?	. . - - . .
-	- . . . . -

Symbol	Morse
'	. - - - - .
"	. - . . - .
/	- . . - .
,	- - . . - -
@	. - - . - .
:	- - - . . .
.	. - . - . -

## Punctuation

Symbol	Meaning	Morse	Symbol	Meaning	Morse
Error	Error (also <HH>)	.....	!	Exclamation mark	-.-.--
&	Ampersand	.-...	.	Full-stop (period)	-.--.
'	Apostrophe	.----.	-	Hyphen	-....-
@	'At' sign	.-.-.-.	×	Multiplication sign (also x)	-...-
)	Close parenthesis	-.--.-	%	Percentage (literally 0/0)	----- -...- -----
(	Open parenthesis	-.-.-.	+	Plus sign	-.--.
:	Colon	---...	"	Quotation marks	-.--.-
,	Comma	--...--	?	Question mark (query)	..--..
=	Equals sign	-...-	/	Slash	-...-

Space: <https://morsecode.world/international/timing.html>