Question 2: Speed typing !

This is the on-screen keyboard from one of the video communication devices we use in our office

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	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
0	1	2	3	4	5	6	7	8	9	!	@	#	$	%	^	&	*	(	)	?	/	|	\	+	-
`	~	[	]	{	}	<	>		SPACE							.	,	;	:	‘	“	_	=	BS	

The on-screen keyboard comes with the following remote control:

	Up	
Left	Enter	Right
	Down	

Write an algorithm that calculates:

- The most efficient way to enter any given sentence in terms of number of key-strokes on the re

there might be more than one way.

- The actual sequence of key-presses on the remote control for each solution.

The following rules apply:

- The initial position of the cursor is at the first character of the sentence that needs to be en
- Only one cursor key can be pressed on the remote control at the same time.
- When the cursor is on the top row and you press *cursor-up* on the remote control, the curs corresponding column on the bottom row. Example: from **E** to **{**
- The same applies to the most left column, the most right column and the bottom-row whe *right*, *cursor-left* and *cursor-down* are pressed on the remote control.
- Special moves:
    - When the cursor is on the **space bar** and *cursor-down* is pressed on the remote cont to **J**.
    - When the cursor is on the **space bar** and *cursor-up* is pressed on the remote contro **#**.
    - When the cursor is on **J**, **K**, **L**, **M**, **N**, **O** or **P** and *cursor-up* is pressed on the remote co move to the **space bar**.
    - When the cursor is on **9**, **!**, **@**, **#**, **$**, **%** or **^** and *cursor-down* is pressed, the cursor will
    - When the cursor is on **back space (BS)** and *cursor-down* is pressed on the remote co move to **Z**.

- When the cursor is on **back space (BS)** and *cursor-up* is pressed on the remote cont
  to **-**.
- When the cursor is on **Y** or **Z** and *cursor-up* is pressed on the remote control, the cur
  space (BS)
- When the cursor is on **+** or **-** and *cursor-down* is pressed on the remote control, the c
  space (BS)

Coding requirements:

- Please code your solution in PHP
- Your solution must include unit tests

Solution

The key under 8 seems blank, much like space but it is separated from space so it can't be space. it was. While awaiting reply I assumed 2 scenarios:

a- That key is disabled, we can't traverse that, we can't enter it.(empty spot, no key at all)

b- That key can't be entered, but it can be traversed(unprogrammed key).

So I coded my class to accept both possibilities. Graph's getInstance's first argument(and the only on whether to assume it as (a) or (b).

Here is the code structure:

app/src/{Graph.php, InvalidArgumentException.php, KeyPress.php, KeySequenceGenerator.php, NodeNotFoundException.php}

app/tests/{GraphTest.php, KeyPressTest.php, KeySequenceGeneratorTest.php}

There is also app/reports (which is not shown here) that contains coverage reports of tests. Here statistics:

Graph.php: 96.89%

KeyPress.php: 100%

KeySequenceGenerator.php: 92.68%

Code was built and tested on:

PHP 5.5.3 (cli) (built: Aug 23 2013 08:41:45)

Zend Engine v2.5.0, Copyright (c) 1998-2013 Zend Technologies

with Xdebug v2.2.3, Copyright (c) 2002-2013, by Derick Rethans

with

PHPUnit 3.7.22 by Sebastian Bergmann.