Time allowed: (Aim for 1 hour)

WARNING: Read instructions carefully and choose the right way to store the data and getting it

from stdin.

Write a program that gives a player's total score of a bowling game when the user inputs a string of characters and numbers used to denote scores in bowling. Specify at least 3 interesting test cases of valid input and the expected score in a comment. Extra: Print out the score for each frame.

Top row is the frame
Middle row is the input they will give
Bottom row is cumulative score of each frame
A column which is not blank is counted as a bowl.

1	1 2		2		3		4		5		6		7		8		9		10	
-	6	Х		4	1	7	2	-	-	3	1	X		Х		X		3	5	
	6		26		43		52		52		72		102		125		143			151

# Example of valid input and output

"X X X X X X X X X XXX"	300
""	0
"-/-/-/-/-"	100
"-123454321X -/813/7"	89
"319-6/X 8/51728/3/7- "	120

The user will input exactly 21 characters, and that it is valid for a real bowling game. Bonus: only allow 21 characters to be read.

There are 10 frames in a bowling game, from 1-9, there are 2 number/characters, and on the 10th, there are 3, the last one is for the bonus calculation only.

To calculate the frame which has a spare add the score of the next bowl (not frame!) and only if there are any with 10 (current frame).

To calculate the frame which has a strike add the score of the next 2 bowls (this may go across 1 or 2 frames) and only if there are any with 10 (current frame).

dash (-) or space () is a 0. A space only occurs at the end where on the 10th frame, they did not get a spare or strike, or after when the person got a strike in frame 1-9.

/ is a spare. X is a strike. 1-9 are the score itself

# Wikipedia entry for how to calculate a strike and spare (not necessary to read if you know how to calculate it):

<u>Strike</u>: When all ten pins are knocked down with the first ball (called a strike and typically rendered as an "X" on a scoresheet), a player is awarded ten points, plus a bonus of whatever is scored with the next two balls. In this way, the points scored for the two balls after the strike are counted twice.

Frame 1, ball 1: 10 pins (strike)

Frame 2, ball 1: 3 pins Frame 2, ball 2: 6 pins

## The total score from these throws is:

• Frame one: 10 + (3 + 6) = 19

• Frame two: 3 + 6 = 9

TOTAL = 28

# A double's pinfall is:

Frame 1, ball 1: 10 pins (Strike)

Frame 2, ball 1: 10 pins (Strike)

Frame 3, ball 1: 9 pins

Frame 3, ball 2: 0 pins (recorded as a dash '-' or '0' on the scoresheet)

#### The total score from these throws is:

Frame one: 10 + (10 + 9) = 29

Frame two: 10 + (9 + 0) = 19

Frame three: 9 + 0 = 9

**TOTAL = 57** 

# A turkey's pinfall is:

Frame 1, ball 1: 10 pins (Strike)

Frame 2, ball 1: 10 pins (Strike)

Frame 3, ball 1: 10 pins (Strike)

Frame 4, ball 1: 0 pins (Gutterball)

Frame 4, ball 2: 9 pins

# The total score from these throws is:

Frame one: 10 + (10 + 10) = 30

Frame two: 10 + (10 + 0) = 20

Frame three: 10 + (0 + 9) = 19

Frame four: 0 + 9 = 9

**TOTAL = 78** 

A player who scores multiple strikes in succession would score like so:

Frame 1, ball 1: 10 pins (strike) Frame 2, ball 1: 10 pins (strike)

Frame 3, ball 1: 4 pins Frame 3, ball 2: 2 pins

#### The score from these throws are:

Frame one: 10 + (10 + 4) = 24
Frame two: 10 + (4 + 2) = 16

• Frame three: 4 + 2 = 6

#### TOTAL = 46

The most points that can be scored in a single frame is **30 points** (10 for the original strike, plus strikes in the two subsequent frames).

A player who bowls a strike in the tenth (final) frame is awarded two extra balls so as to allow the awarding of bonus points. If both these balls also result in strikes, a total of 30 points (10 + 10 + 10) is awarded for the frame.

**Spare**: A "spare" is awarded when no pins are left standing after the second ball of a frame; i.e., a player uses both balls of a frame to clear all ten pins. A player achieving a spare is awarded ten points, plus a bonus of whatever is scored with the next ball (only the first ball is counted). It is typically rendered as a slash on scoresheets in place of the second pin count for a frame. Example:

Frame 1, ball 1: 7 pins

Frame 1, ball 2: 3 pins (spare)

Frame 2, ball 1: 4 pins Frame 2, ball 2: 2 pins

#### The total score from these throws is:

• Frame one: 7 + 3 + 4 (bonus) = 14

• Frame two: 4 + 2 = 6

#### TOTAL = 20

A player who bowls a spare in the tenth (final) frame is awarded one extra ball to allow for the bonus points.

Correctly calculating bonus points can be difficult, especially when combinations of strikes and spares come in successive frames. In modern times, however, this can been overcome by your program.