Report

Design of the Program:   
My program extensively uses bool functions. The first function: isValidCDPlayerString(string cdstring) Detects whether the string entered is valid through checking the string character by character and checking for the various predefined characters. It also helps detect the various stages of the string i.e detect if the player is open or whether it is closed. So not only does this first function ascertain the correctness of the string, it also reads through the string to check what's happening to the player.

The second function just checks if the CD player is open by checking the string for values of ‘O’ and ‘C.’

The third function checks if a disc is inserted by checking the string for values of ‘R’ and ‘I’ and their iterations. Thus this function returns true if the string is valid i.e. has the predefined characters only and also has the CD. The third function checks for the total tracks played. It scans the string for integer values in the string.

The fourth function determines the total tracks played in the player by reading through the int values of the string and incrementing them with each consecutive number.

The fifth function determines the current track playing by checking the last track played and incrementing it by 1. The program also checks if the opening character of the string is ‘O’ and if it’s not, it returns a false value for the isValidCDPlayerString(string cdstring).

Lastly, it prints out all the values for the functions, for the input string.

Test Cases

1) Input : OIC

Expected output: isValidCDPlayerString returns true

isOpen(s) returns false

hasCD(s) returns true

Reasoning: Checks for the very basic input, just opening the player, inserting a CD and closing the player

2) Input : OICP123

Expected output: isValidCDPlayerString returns true

isOpen(s) returns false

hasCD(s) returns true

totalTracksPlayed(s) returns 3

currentTracks(s) returns 4

Reasoning: Shows whether the program is reading the int values for the tracks, and able to increment them for currentTrack(s) and totalTrack(s).

3) Input : OICIO

Expected output: isValidCDPlayerString returns false

isOpen(s) returns false

hasCD(s) returns true

totalTracksPlayed(s) returns -1

currentTracks(s) returns -1

Reasoning: Shows if the program can handle erroneous strings for the CD player like inserting when it is closed, or inserting an already inserted disc. The program fails here as it should return true for hasCD(s).

4) Input : OIC123SRI456

Expected output: isValidCDPlayerString returns false

isOpen(s) returns false

hasCD(s) returns false

totalTracksPlayed(s) returns -1

currentTracks(s) returns -1

Reasoning: Shows that the player needs to be opened before a new CD is inserted. Thus, the string value here is false. Also, it has to be played for the string to read int values.

5) Input : hello world

Expected output: isValidCDPlayerString returns false

isOpen(s) returns false

hasCD(s) returns false

totalTracksPlayed(s) returns -1

currentTracks(s) returns -1

Reasoning: Shows that the string can only have certain specific characters.

6) Input : OICP6789

Expected output: isValidCDPlayerString returns false

isOpen(s) returns false

hasCD(s) returns false

totalTracksPlayed(s) returns -1

currentTracks(s) returns -1

Reasoningt: Shows that the tracks should begin with 1 and not just any number.

7) Input : OICP123SO

Expected output: isValidCDPlayerString returns true

isOpen(s) returns true

hasCD(s) returns true

totalTracksPlayed(s) returns 3

currentTracks(s) returns 4

Reasoning: Shows that the program can read ‘S’ and ‘O’ characters and return a true value for the string.

8) Input : OICP6789

Expected output: isValidCDPlayerString returns false

isOpen(s) returns false

hasCD(s) returns false

totalTracksPlayed(s) returns -1

currentTracks(s) returns -1

Reasoning: Shows that the tracks should begin with 1 and not just any number.

9) Input : OICP1234567SORIC89

Expected output: isValidCDPlayerString returns false

isOpen(s) returns false

hasCD(s) returns false

totalTracksPlayed(s) returns -1

currentTracks(s) returns -1

Reasoning: Shows that the string is invalid because everytime a new CD is inserted in the player, the track count should reset.

10) Input : OICP12345SORICP123

Expected output: isValidCDPlayerString returns true

isOpen(s) returns false

hasCD(s) returns true

totalTracksPlayed(s) returns 8

currentTracks(s) returns 4

Reasoning: Shows that the string is valid as the CD player is stopped and a new disc is inserted and played with the track count reset.