

# Practical 5

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Batch: A2      Roll No: 31

Subject: DAA Lab

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## Problem Statement:

Implement a spell corrector using Edit Distance algorithm.

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## Code:

```
#include <bits/stdc++.h>
using namespace std;

//Finds minimum of three numbers
int min(int x, int y, int z)
{
    return min(min(x, y), z);
}

int editDistDP(string str1, string str2, int m, int n)
{
    //Table to store results of subproblems
    int dp[m + 1][n + 1];

    //Fills d[][] in bottom up manner
    for (int i = 0; i <= m; i++)
    {
        for (int j = 0; j <= n; j++)
        {
            //If first string is empty,
            //insert all characters of second string
            if (i == 0)
                dp[i][j] = j; // Min. operations = j
```

```

        //If second string is empty,
        //remove all characters of second string
        else if (j == 0)
            dp[i][j] = i; // Min. operations = i

        //If last characters are same,
        //ignore last char and recur for remaining string
        else if (str1[i - 1] == str2[j - 1])
            dp[i][j] = dp[i - 1][j - 1];

        //If the last character is different,
        //consider all possibilities and find the minimum
        else
            dp[i][j] = 1 + min(dp[i][j - 1],      // Insert
                               dp[i - 1][j],      // Remove
                               dp[i - 1][j - 1]); // Replace
    }
}

return dp[m][n];
}

//Driver code
int main()
{
    //Stored dictionary of 10 words
    char dictionary[10][10] = {"hello", "hell", "halo", "hand", "help", "god",
                              "gold", "good", "goon", "gone"};

    //Prints the words of the dictionary
    cout << "\nThe words in the dictionary are: \n";
    for (int i = 0; i < 10; i++)
    {
        cout << dictionary[i] << "\n";
    }
    cout << "\n";

    //A word is taken as input

```

```

string str1;
cout << "\nEnter the word: \n";
cin >> str1;

string str2;

//The distances i.e. the no. of changes on each word to make it like str1 is
stored here
int arr[10];

//Checking str1 with every word of the dictionary to fill arr[]
for (int i = 0; i < 10; i++)
{
    //If the word is found as it is in the dictionary
    if (str1 == dictionary[i])
    {
        cout << "\nCORRECT SPELLING!\n";
        exit(0);
    }
    //If word doesn't match run the algo.
    else
    {
        str2 = dictionary[i];
        arr[i] = editDistDP(str1, dictionary[i], str1.length(),
str2.length());
    }
}

//Print the distance
// for (int i = 0; i < 10; i++)
// {
//     cout << arr[i] << "\t";
// }

int min = 99;

cout << "\nThe spelling of the word you entered is incorrect:\n";
cout << "\nDid you mean:\n\n";

```

```
for (int j = 0; j < 5; j++)
{
    //Stores index of the minimum value in each iteration
    int var;

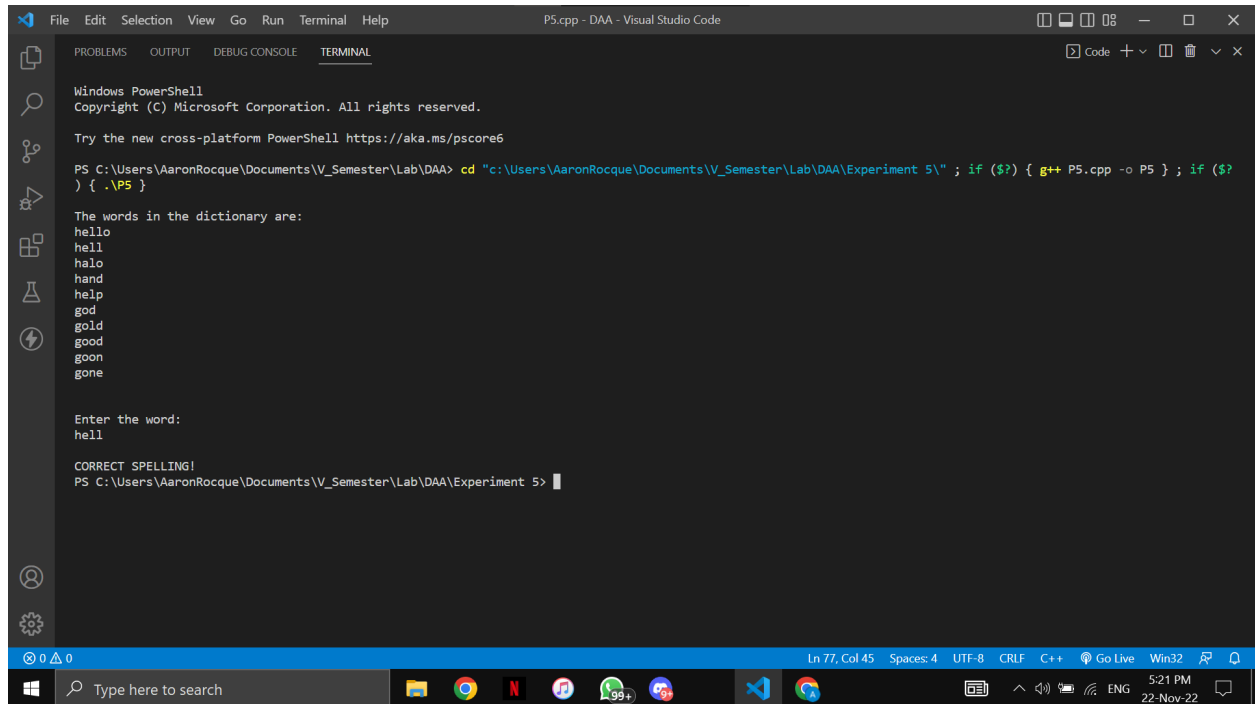
    for (int i = 0; i < 10; i++)
    {
        if (arr[i] <= min)
        {
            min = arr[i];
            var = i;
        }
    }

    min = 99;
    arr[var] = 9999;
    cout << dictionary[var] << "\n";
}

return 0;
}
```

---

## Output:



```
Windows PowerShell
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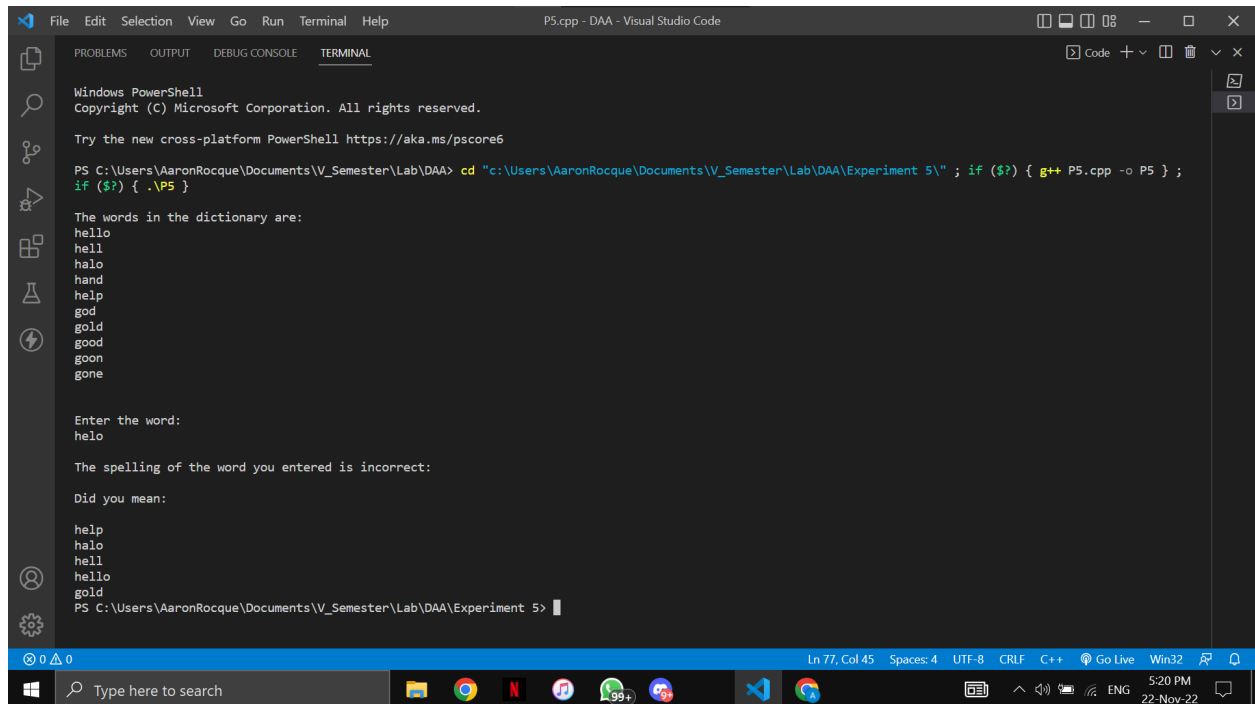
Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\AaronRocque\Documents\V_Semester\Lab\DAA> cd "c:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5\" ; if ($?) { g++ P5.cpp -o P5 } ; if ($?) { .\P5 }

The words in the dictionary are:
hello
hell
halo
hand
help
god
gold
good
goon
gone

Enter the word:
hell

CORRECT SPELLING!
PS C:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5>
```



```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\AaronRocque\Documents\V_Semester\Lab\DAA> cd "c:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5\" ; if ($?) { g++ P5.cpp -o P5 } ; if ($?) { .\P5 }

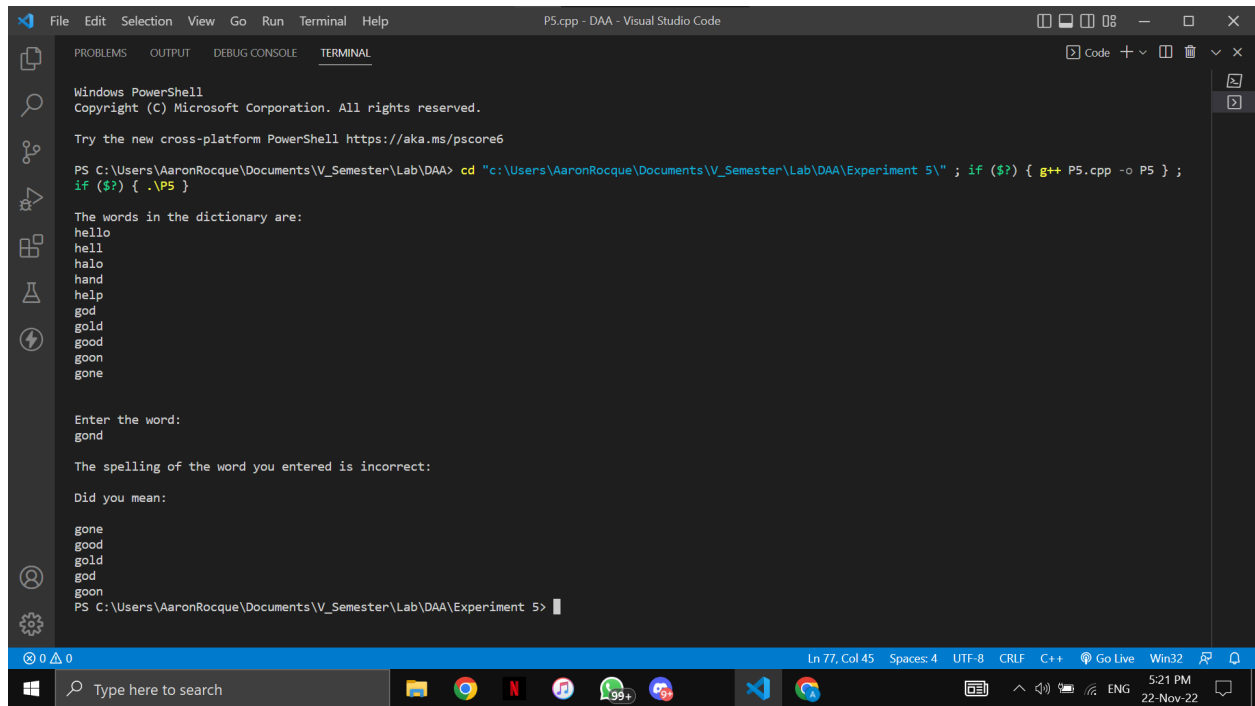
The words in the dictionary are:
hello
hell
halo
hand
help
god
gold
good
goon
gone

Enter the word:
helo

The spelling of the word you entered is incorrect:

Did you mean:

help
halo
hell
hello
gold
PS C:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5>
```



The screenshot shows the Visual Studio Code interface with a terminal window open. The terminal is running a Windows PowerShell session. The user has navigated to the directory `c:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5\` and executed a C++ program. The program's output is as follows:

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\AaronRocque\Documents\V_Semester\Lab\DAA> cd "c:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5\" ; if ($?) { g++ P5.cpp -o P5 } ;
if ($?) { .\P5 }

The words in the dictionary are:
hello
hell
halo
hand
help
god
gold
good
goon
gone

Enter the word:
gond

The spelling of the word you entered is incorrect:

Did you mean:

gone
good
gold
god
goon
PS C:\Users\AaronRocque\Documents\V_Semester\Lab\DAA\Experiment 5>
```

The status bar at the bottom of the window indicates the current file is `P5.cpp` at line 77, column 45. The encoding is UTF-8, and the line endings are CRLF. The system tray shows the time as 5:21 PM on 22-Nov-22.