

DESIGN ANALYSIS OF ALGORITHMS

ASSIGNMENT-4

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1. Carfuel

CODE:

```
#include <iostream>
#include <vector>
using namespace std;

int MinRefills( int n, int milesAway, vector<int> Stops, int fulltank)
{
    int numRefills = 0;
    int currentRefill = 0;
    int lastRefill = 0;

    if ((Stops[currentRefill] + fulltank) >= milesAway) {
        return numRefills;
    }

    while (currentRefill < n) {
        lastRefill = currentRefill;
        while ( ( currentRefill < n ) && ( (Stops[currentRefill + 1] -
Stops[lastRefill]) <= fulltank ) )
        {
            currentRefill = currentRefill + 1;
        }

        cout << currentRefill << " " << Stops[currentRefill] << "\n";

        if (currentRefill == lastRefill)
        {
```

```

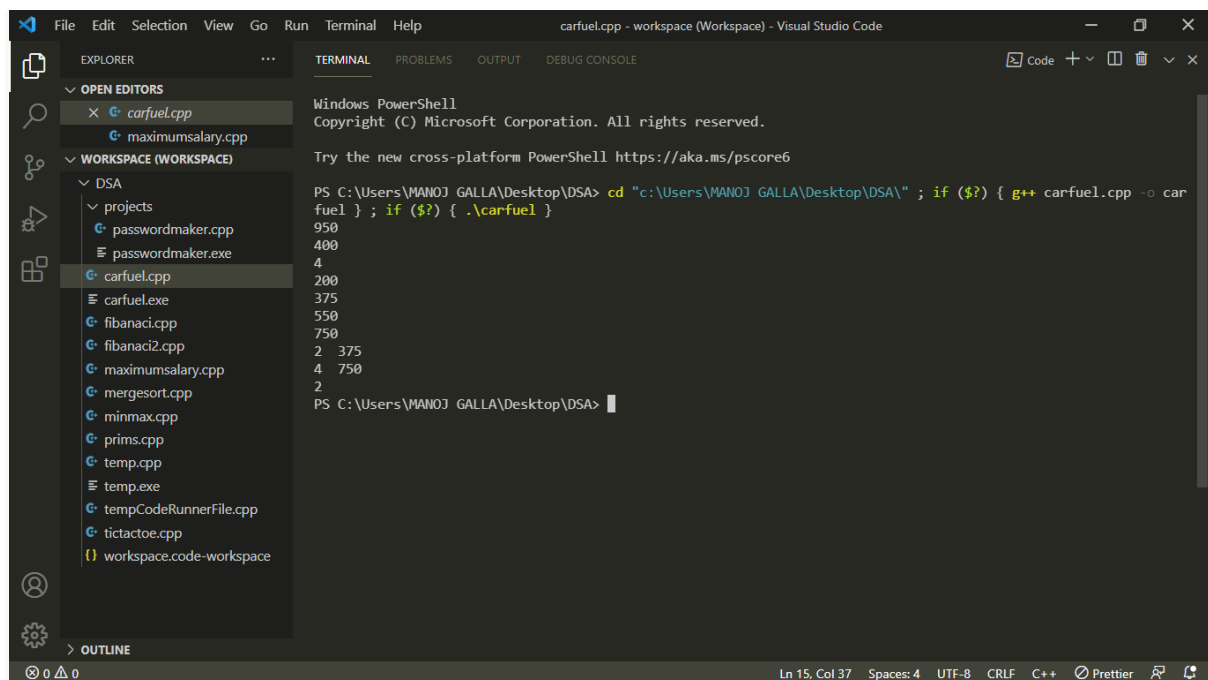
        return -1;
    }
    numRefills = numRefills + 1;

    if ((Stops[currentRefill] + fulltank) >= milesAway)
    {
        return numRefills;
    }
}
return -1;
}

int main() {
    int milesAway, fulltank, n, stopValue;
    vector<int> Stops;
    cin >> milesAway;
    cin >> fulltank;
    cin >> n;
    Stops.push_back(0);
    if (n == 4) {
        int stop1, stop2, stop3, stop4;
        cin >> stop1 >> stop2 >> stop3 >> stop4;
        Stops.push_back(stop1);
        Stops.push_back(stop2);
        Stops.push_back(stop3);
        Stops.push_back(stop4);
    }
    else {
        for (int i = 0; i < n; i++) {
            cin >> stopValue;
            Stops.push_back(stopValue);
        }
    }
    cout << MinRefills(n, milesAway, Stops, fulltank)<<endl;
    return 0;
}

```

OUTPUT:



The screenshot shows the Visual Studio Code interface with a workspace named 'carfuel.cpp - workspace (Workspace)'. The Explorer panel on the left shows a project structure with a 'DSA' folder containing 'projects', 'passwordmaker.cpp', 'passwordmaker.exe', 'carfuel.cpp', 'carfuel.exe', 'fibanaci.cpp', 'fibanaci2.cpp', 'maximumsalary.cpp', 'mergesort.cpp', 'minmax.cpp', 'prims.cpp', 'temp.cpp', 'temp.exe', 'tempCodeRunnerFile.cpp', 'tictactoe.cpp', and 'workspace.code-workspace'. The Terminal panel on the right shows the output of a PowerShell command executed in the directory 'C:\Users\MANOJ GALLA\Desktop\DSA'. The command is 'cd "c:\Users\MANOJ GALLA\Desktop\DSA\" ; if (\$?) { g++ carfuel.cpp -o carfuel } ; if (\$?) { .\carfuel }'. The output shows the execution of the program, which prints the maximum salary for a given digit. The output is: 950, 400, 4, 200, 375, 550, 750, 2 375, 4 750, 2. The status bar at the bottom indicates the current line is 15, column 37, with 4 spaces, UTF-8 encoding, CRLF line endings, and C++ language.

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

PS C:\Users\MANOJ GALLA\Desktop\DSA> cd "c:\Users\MANOJ GALLA\Desktop\DSA\" ; if ($?) { g++ carfuel.cpp -o carfuel } ; if ($?) { .\carfuel }
950
400
4
200
375
550
750
2 375
4 750
2
PS C:\Users\MANOJ GALLA\Desktop\DSA>
```

2. Maximum Salary

CODE:

```
#include <algorithm>
#include <sstream>
#include <iostream>
#include <vector>
#include <string>

using std::vector;
using std::string;

bool IsGreaterOrEqual(string digit, string maxDigit){

if (digit+maxDigit >=maxDigit +digit) {

return true;
```

```

}else{

return false;

}

}

string largest_number(vector<string> a) {

string result;

std::stringstream ret;

while (a.size()) {

string Maxdigit("0");

size_t index = 0;

for (size_t digit = 0; digit < a.size(); digit++) {

if (IsGreaterOrEqual(a[digit], Maxdigit)) {

Maxdigit = a[digit] ;

index = digit;

}

}

ret << Maxdigit;

a.erase(a.begin() + index);

}

ret >> result;

```

```

return result;

}

int main() {

int n;

std::cin >> n;

vector<string> a(n);

for (size_t i = 0; i < a.size(); i++) {

std::cin >> a[i];

}

std::cout << largest_number(a);

}

```

OUTPUT:

The screenshot shows the Visual Studio Code interface. The Explorer panel on the left displays the file structure of a workspace named 'maximumsalary.cpp - workspace (Workspace)'. The file 'maximumsalary.cpp' is selected. The Terminal panel on the right shows the output of a PowerShell command. The command executed is:

```
PS C:\Users\MANOJ GALLA\Desktop\DSA> cd "c:\Users\MANOJ GALLA\Desktop\DSA\" ; if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
```

The output of the program is:

```
5
9 4 6 1 9
99641
```

The status bar at the bottom indicates the current line and column: 'Ln 84, Col 2 (896 selected)'. The status bar also shows the file encoding as 'UTF-8', the line ending as 'CRLF', and the file type as 'C++'. The status bar also shows the file encoding as 'UTF-8', the line ending as 'CRLF', and the file type as 'C++'.