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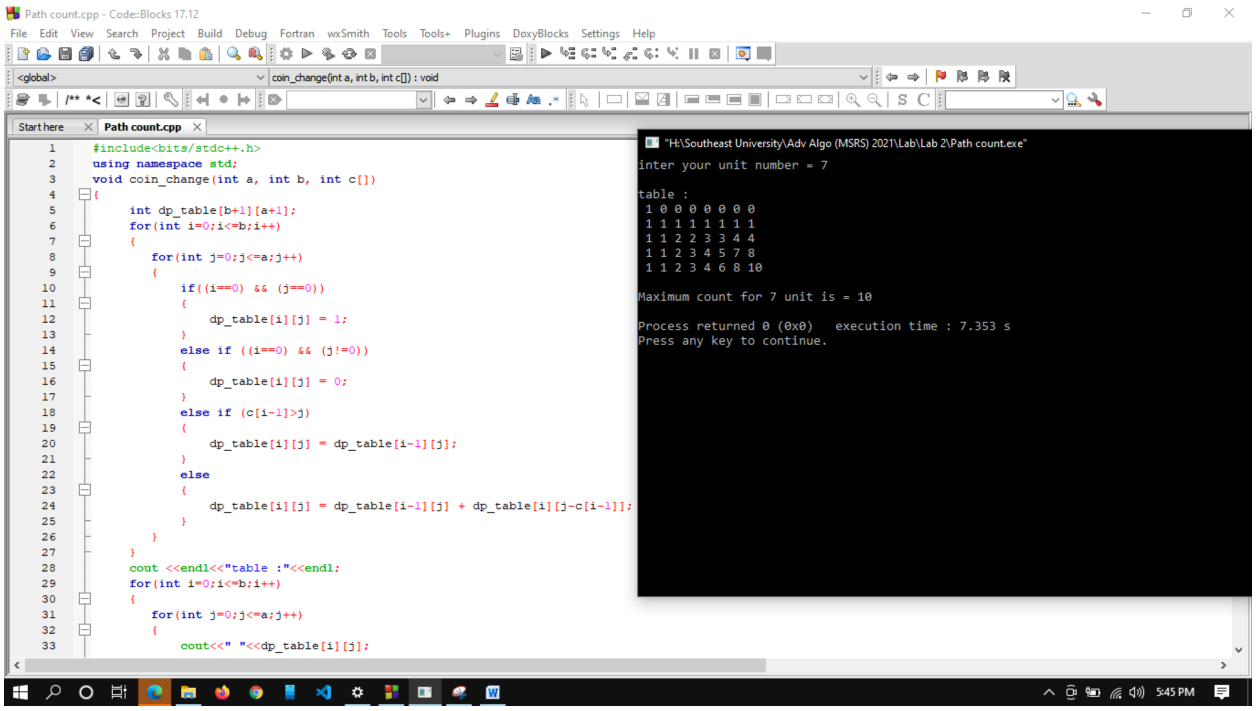
Assignment#2 - Coin Change Problem Implementation using Dynamic Programming in any of your preferred Programming Language (C/C++/Java)

Code:

```
#include<bits/stdc++.h>

using namespace std;

void coin_change(int a, int b, int c[])

{

    int dp_table[b+1][a+1];

    for(int i=0;i<=b;i++)

    {

      for(int j=0;j<=a;j++)

      {

         if((i==0) && (j==0))

         {

            dp_table[i][j] = 1;

         }

         else if ((i==0) && (j!=0))

         {

            dp_table[i][j] = 0;

         }
```

```
            else if (c[i-1]>j)

            {

                dp_table[i][j] = dp_table[i-1][j];

            }

            else

            {

                dp_table[i][j] = dp_table[i-1][j] + dp_table[i][j-c[i-1]];

            }

        }

    }

    cout <<endl<<"table :"<<endl;

    for(int i=0;i<=b;i++)

    {

      for(int j=0;j<=a;j++)

      {

          cout<<" "<<dp_table[i][j];

      }

    cout<<endl;

    }

    cout<<endl<<"Maximum count for "<<a<<" unit is = "<<dp_table[b][a];

    cout<<endl;

}

int main()

{

    cout<<"inter your unit number = ";
    int unit;

    cin>>unit;

    int coins[] = {1, 2, 3, 5};

    int size = sizeof(coins)/sizeof(int);

    coin_change(unit, size, coins);

    return 0;

}
```

Output:



Path count.cpp - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global>
coin_change(int a, int b, int c[]) : void
Start here
Path count.cpp
5:45 PM

```
#include<bits/stdc++.h>
using namespace std;
void coin_change(int a, int b, int c[])
{
     int dp_table[b+1][a+1];
     for(int i=0;i<=b;i++)
     {
        for(int j=0;j<=a;j++)
        {
            if((i==0) && (j==0))
            {
                dp_table[i][j] = 1;
            }
            else if ((i==0) && (j!=0))
            {
                dp_table[i][j] = 0;
            }
            else if (c[i-1]>j)
            {
                dp_table[i][j] = dp_table[i-1][j];
            }
            else
            {
                dp_table[i][j] = dp_table[i-1][j] + dp_table[i][j-c[i-1]];
            }
        }
     }
     cout <<endl<<"table :"<<endl;
     for(int i=0;i<=b;i++)
     {
        for(int j=0;j<=a;j++)
        {
            cout<<" "<<dp_table[i][j];
```

```
"H:\Southeast University\Adv Algo (MSRS) 2021\Lab\Lab 2\Path count.exe"
inter your unit number = 7

table :
 1 0 0 0 0 0 0 0
 1 1 1 1 1 1 1 1
 1 1 2 2 3 3 4 4
 1 1 2 3 4 5 7 8
 1 1 2 3 4 6 8 10

Maximum count for 7 unit is = 10

Process returned 0 (0x0)   execution time : 7.353 s
Press any key to continue.
```