

CSC 150 LAB 4-1 MORE ON FUNCTIONS

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DEPT OF COMPUTER SCIENCE

1. SETTING UP

Start with the following shell of a program:

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

void output(vector<int> vec)
{

}

int main()
{

    vector<int> myvec;
    // Fill the vector with the first 10 positive squares
    // ** your code goes here

    // print the squares
    output(myvec);
    cout << endl;
    system("pause");
}
```

You only need the `system("pause");` at the end if your output window is disappearing before you can see the output.

2. PRINTING A VECTOR OF SQUARES

- (1) Fill in the code in the body of the `output()` function so that it prints a comma-separated list of the values stored in the integer vector `vec`. To begin with, you are allowed to have a comma after the last value.

The values in the vector, when printed, should be enclosed in square brackets.

- (2) Fill in the code indicated by the comment in the `main()` function.

When you run the program, you should see output that looks like this:

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100, ]
```

3. PRINTING A VECTOR OF CUBES

Add a section of code that clears the vector, and then fills it with the first 15 positive cubes. Add code that prints this new vector using the `output()` function.

Now your output should look like this:

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100, ]
[1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375, ]
```

4. MODIFY THE `output` FUNCTION

Now modify the `output()` function so that the last trailing comma is suppressed.

Output should look like this

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
[1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375]
```

5. DECIMAL DIGITS

Digits are the characters `'0'`, `'1'`, ..., `'9'`, but in this lab we will think of them as integers.

The decimal digits of a non-negative integer are the characters that make up the decimal representation of the number. For example, the decimal digits of 423 are `'4'`, `'2'`, `'3'`.

Add the function shell

```
vector<int> decimal_digits(int number)
{
    vector<int> d_digits;
    // code to store decimal digits in vector
    // goes here

    return d_digits;
}
```

and then fill in the code where indicated so that the function returns a vector that contains the digits of the number passed as parameter.

Once that is done, add code to the `main` function that prints out the vector of digits using the `output()` function you wrote earlier.

The output for this last part should look like this

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
[1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375]
Enter an integer: 527
The decimal digits are [7, 2, 5]
```

6. ADD A LOOP TO REPEAT THE LAST PART 3 TIMES

Add a loop so the program asks the user for a nonnegative integer three times, and each time prints the decimal digits.

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

```
[1, 8, 27, 64, 125, 216, 343, 512, 729, 1000, 1331, 1728, 2197, 2744, 3375]
```

```
Enter a number: 1283
```

```
The decimal digits are: [3, 8, 2, 1]
```

```
Enter a number: 199834
```

```
The decimal digits are: [4, 3, 8, 9, 9, 1]
```

```
Enter a number: 0
```

```
The decimal digits are: [0]
```

This lab is due Thursday of Week 4 at midnight.