

CSCI 135 Software Design and Analysis, C++

Lab 2

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Lab A: FIZZ BUZZ

This is a famous question. You need to print the numbers from 1 to 100. But if the number is a multiple of three, print “FIZZ” instead. If it is a multiple of five, print “BUZZ” instead. If it is a multiple of both, print “FIZZBUZZ” instead.

```
int main() {
    for (int i=1; i<=100; i=i+1)
        if (i%3==0 && i%5==0)
            cout<<"FIZZBUZZ\n";
        else if (i%3==0)
            cout<<"FIZZ\n";
        else if (i%5==0)
            cout<<"BUZZ\n";
        else
            cout<<i<<' \n';
}
```

Lab B: Leap years

(a) A leap year is one that is divisible by 4 but not 100, unless it is divisible by 400. Write a function that accepts an integer as a parameter (the year), and returns true if the year is a leap year, and false otherwise.

```
bool leapyear(int y) {
    return (y%4==0 && (y%100!=0 || y%400==0));
}
```

(b) Then, from main, use that function to output “LEAP” or “NOT LEAP” for all the years from 1900 until 2014.

```
int main() {
    for (int y=1900; y<=2014; y=y+1)
        if (leapyear(y))
            cout<<"LEAP\n";
        else
            cout<<"NOT LEAP\n";
}
```

Lab C: Strange sum

(a) Write a function that takes as parameter an integer and returns the sum of its digits. To do this, use the division and modulus operators to extract the digits one at a time. For example, if the number is 123, observe that $123\%10$ is 3 and $123/10$ is 12. You will need to use a loop.

```
int digitSum(int n) {
    int s=0;
    while(n!=0) {
        s=s+n%10;
        n=n/10;
    }
    return s;
}
```

(b) From main, write a program that outputs the sum of digits for all numbers from 0 to 100.

```
int main() {
    for (int n=0; n<=100; n=n+1)
        cout<<digitSum(n)<<'\n';
}
```