

## Let's code Fizzbuzz -1.0

**\$ Enter a number: 1**

**1**

**\$ Enter a number: 2**

**2**

**\$ Enter a number: 3**

**fizz**

**\$ Enter a number: 4**

**4**

**\$Enter a number: 5**

**5**

**\$Enter a number: 6**

**fizz**

**\$Enter a number: 7**

**7**

**\$Enter a number: 15**

**fizz**

## Fill in the 'if' condition to detect numbers divisible by 3

A. `x / 3 == 0`

B. `! (x % 3)`

C. `x % 3 == 0`

D. Either B or C

E. None of the above

```
if ( _____ )  
    cout << x << "is divisible by 3 \n" ;  
}
```

# Control Flow: Multiway if-else

```
if (x > 100) {  
    pet = dog;  
    count++;  
} else if (x > 90) {  
    pet = cat;  
    count++;  
} else {  
    pet = owl;  
}
```

==

```
if (x > 100) {  
    pet = dog;  
    count++;  
} else {  
    if (x > 90) {  
        pet = cat;  
        count++;  
    } else {  
        pet = owl;  
    }  
}
```

- Can you write this code in a more compact way?

## Let's code Fizzbuzz -2.0

**\$ Enter a number: 1**

**1**

**\$ Enter a number: 2**

**2**

**\$ Enter a number: 3**

**fizz**

**\$ Enter a number: 4**

**4**

**\$Enter a number: 5**

**buzz**

**\$Enter a number: 6**

**fizz**

**\$Enter a number: 10**

**buzz**

**\$Enter a number: 15**

**fizzbuzz**

# LOOPS

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Problem Solving with Computers-I

<https://ucsb-cs16-sp17.github.io/>

C++

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

int main(){
    cout<<"Hola Facebook!n";
    return 0;
}
```



# Control Flow: for loops

Initialization      Termination condition      Update after each iteration

```
for ( int i = 0; i < 15; i++ ) {  
    cout << i << endl ;  
}
```

What is the output of the above code?

Write a program that generates the following output:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Previous code:

```
for (int i = 0; i < 15; i++) {  
    cout << i << endl ;  
}
```

Modify the program from the previous example to print a sequence:  $x_{\min}$ ,  $x_{\min}+1$ ,  $x_{\min}+2$ , ...,  $x_{\max}$  for user specified inputs  $x_{\min}$  and  $x_{\max}$

Sample run of the program:

```
$ ./test
```

```
Enter the limits of the sequence
```

```
10 15
```

```
10, 11, 12, 13, 14, 15
```



Write a program that calculates the sum of the series:  
1, 2, 3, ....n  
where `n` is specified by the user

Sample run of the program:

```
Enter the number of terms in the sequence
```

```
4
```

```
Sum of the first 4 terms is: 10
```

# Fizzbuzz – 3.0

1

2

fizz

4

buzz

fizz

7

8

fizz

buzz

fizzbuzz

**Let's code Fizzbuzz 3.0!**

# Control Flow: while loops

```
while (Boolean expression) {  
    //statement 1  
    //statement 2  
  
}
```

Repeat the previous exercises with while loops

Use while loops to print a sequence:  $x_{\min}$ ,  $x_{\min}+1$ ,  $x_{\min}+2$ , ...,  $x_{\max}$   
for user specified inputs  $x_{\min}$  and  $x_{\max}$

Sample run of the program: (You must use while loops)

```
$ ./test_while
```

```
Enter the limits of the sequence
```

```
10 15
```

```
10, 11, 12, 13, 14, 15
```

# C++ types in expressions

```
int i =10;
```

```
double sum = 1/i;
```

What value is in the sum variable after executing the above code?

- A. 0
- B. 0.1
- C. 1
- D. None of the above

# Setting up output when printing doubles

```
int i =10;
double sum = 1/static_cast<double>(i);
cout.setf(ios::fixed);      // Using a fixed point representation
cout.setf(ios::showpoint); //Show the decimal point
cout.precision(3);
cout<<sum;
```

What is printed by the above code?

- A. 0
- B. 0.1
- C. 0.10
- D. 0.100
- E. None of the above

Write a program that calculates the series:  
 $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$ ,  
where `n` is specified by the user

Sample run of the program:

```
Enter the number of terms in the sequence
```

```
2
```

```
Sum of the first 2 terms is : 1.500
```

# for loop OR while loop? Which one should you use?

```
for (int i = 0; i < 15; i++) {  
    cout << i << endl ;  
}
```

```
int j =0;  
while(j < 15) {  
    cout << j << endl ;  
    j++;  
}
```



# Nesting control structure

```
for (int i = 0; i < 15; i++) {  
    if (i%3 == 0)  
        cout<<"fizz"<<endl;  
    else  
        cout << i << endl ;  
}
```

Can we write nested for loops?

# Nested for loops – ASCII art!

Write a program that draws a square of a given width

```
./drawSquare  
Enter the width of the square  
5  
*****  
*****  
*****  
*****  
*****
```

# Draw a triangle

Which line of the drawSquare code (shown on the right) would you modify to draw a right angled triangle

```
./drawTriangle
Enter the length of the base
5

*
**
***
****
```

```
5 int main(){
6     int side;
7     cout<<"Enter the length of the base"<<endl;
8     cin>>side;
9
10    for(int j = 0; j < side; j++){ //A
11        for(int i=0; i < side; i++){ //B
12            cout<<"*"; //C
13        }
14        cout<<endl; //D
15    }
16    cout<<endl; //E
17
18 }
```

# Infinite loops

```
for (int y=0; y<10; y--)  
    cout<<"Print forever\n";
```

```
int y=0;  
for (; y++)  
    cout<<"Print forever\n";
```

```
int y=0;  
for (; y<10; ) ;  
    y++;
```

```
int y=0;  
while (y<10)  
    cout<<"Print forever\n";
```

```
int y=0;  
while (y=2)  
    y++;
```