8 Iterative Statement Lectures - Week 6 - Iterative Statements - Introduction to Programming in C++ - edX.ts - VLC media player

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Motivation

NYU TANDON ONLINE

Data

- `int`
- unsigned `int`
- `float`
- `double`
- `char`
- `bool`

Expressions

- I/O expressions
- Arithmetic expressions
- Boolean expressions

Control Flow

- Sequential
- Branching
  - if
  - if-else
  - if-else if-else

00:22 46:38

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Motivation

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Let's Count

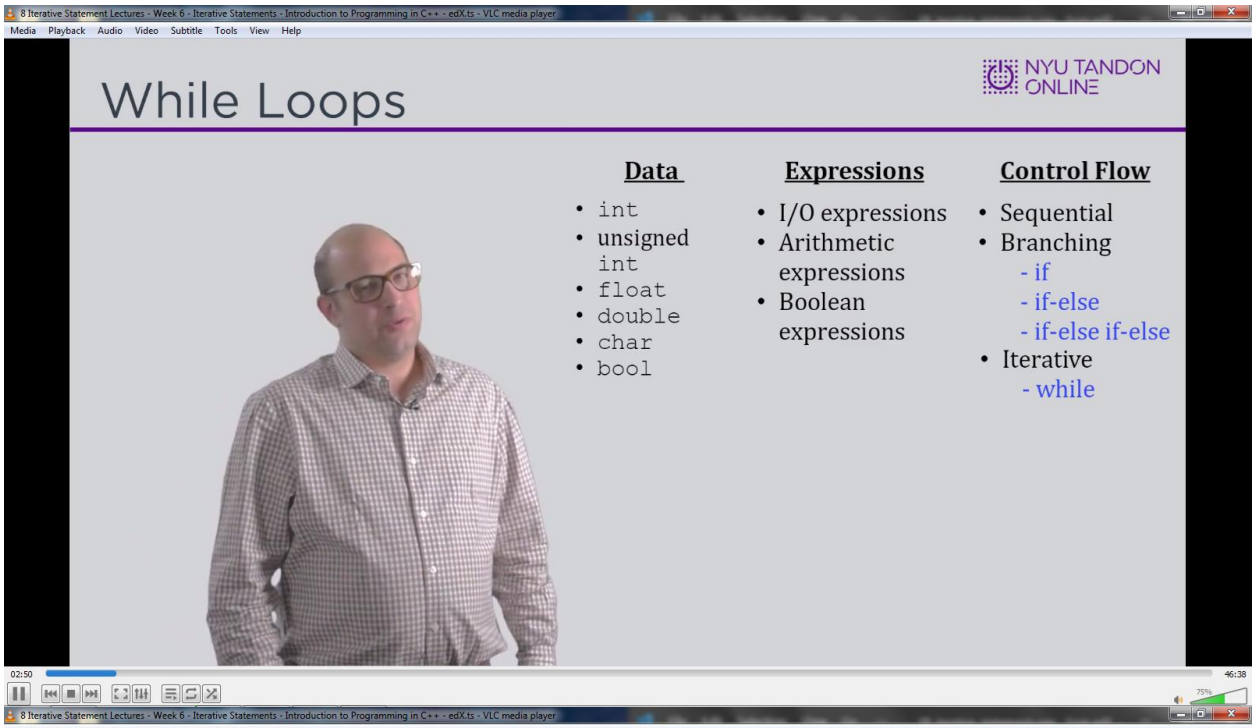
Problem

Write a program that reads a positive integer n, and prints the numbers from 1 up to n.

Example

Please enter a positive integer:
4
1
2
3
4

01:16 46:38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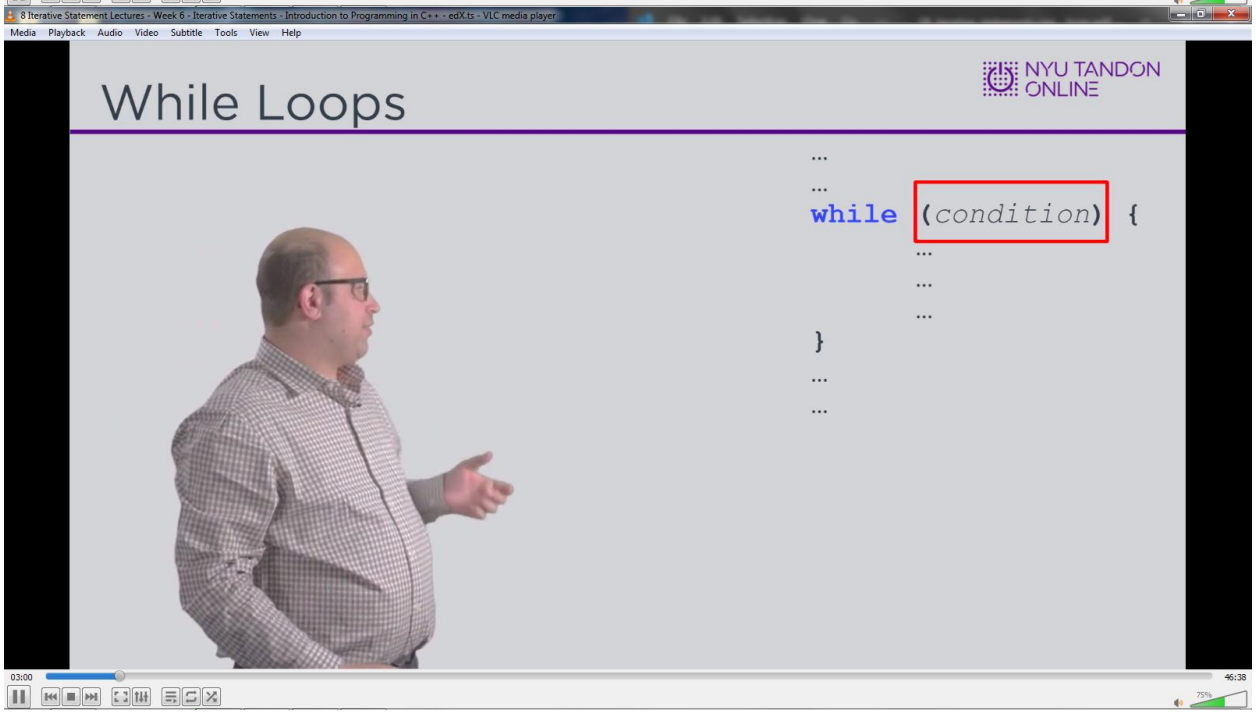
While Loops
NYU TANDON ONLINE
Data
int
unsigned int
float
double
char
bool
Expressions
I/O expressions
Arithmetic expressions
Boolean expressions
Control Flow
Sequential
Branching
- if
- if-else
- if-else if-else
Iterative
- while
02:50
46:38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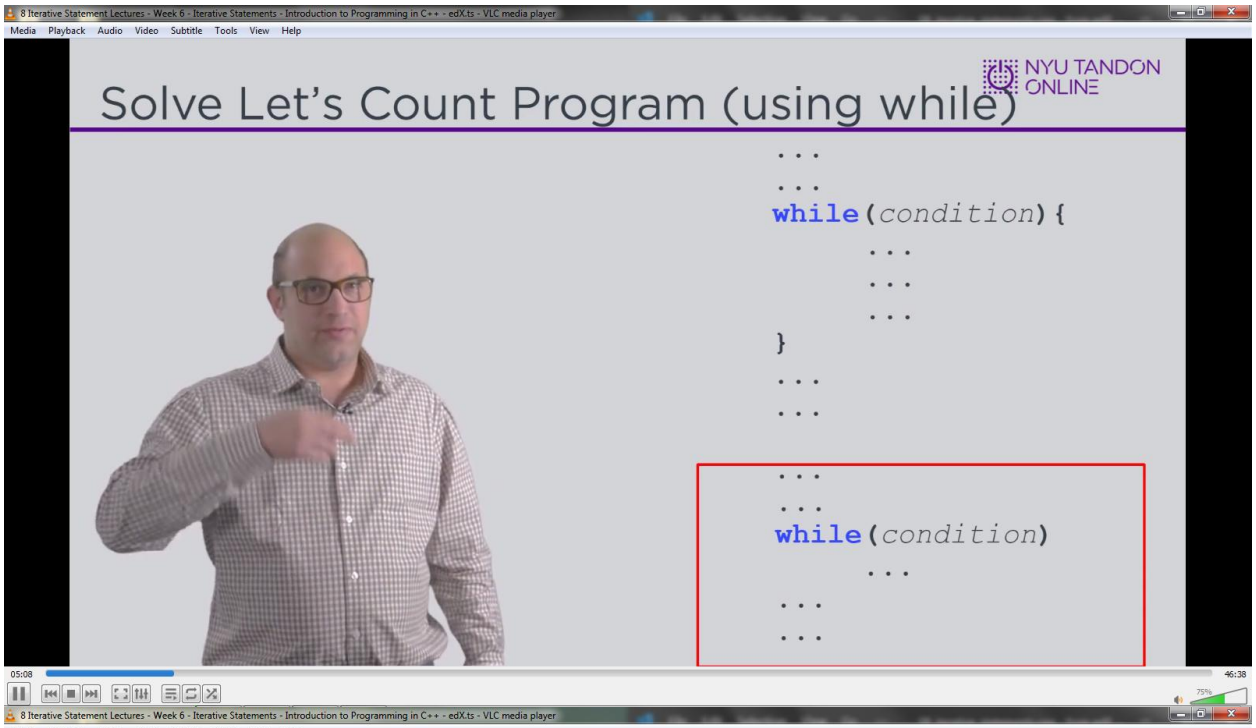
While Loops
NYU TANDON ONLINE
...
...
while (condition) {
...
...
...
}
...
...
03:00
46:38


8 Iterative Statement Lectures - Week 6 - Iterative Statements - Introduction to Programming in C++ - edX.ts - VLC media player
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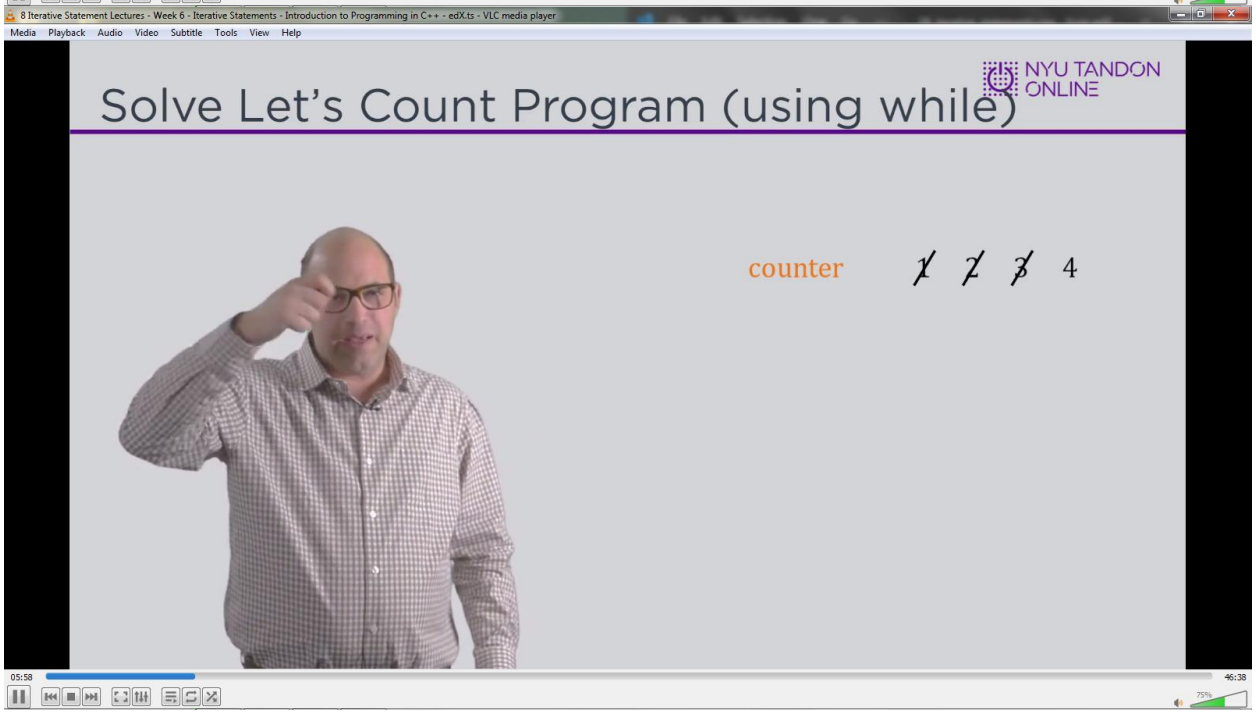
Solve Let's Count Program (using while)
NYU TANDON ONLINE
while(condition){
}
while(condition)
05:08
46:38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Solve Let's Count Program (using while)
NYU TANDON ONLINE
counter
4
05:58
46:38

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For Loops

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Data

- `int`
- unsigned `int`
- `float`
- `double`
- `char`
- `bool`

Expressions

- I/O expressions
- Arithmetic expressions
- Boolean expressions

Control Flow

- Sequential
- Branching
  - if
  - if-else
  - if-else if-else
- Iterative
  - while
  - for

09:34 46:38

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For Loops

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```
...
...

for(initialization; condition;
    increment){
        ...
        ...
        ...
}
...
...
```

09:48 46:38

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For Loops

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```
...
...

for(initialization; condition;
    increment){
     ...
     ...
     ...
}
...
...
for(initialization; condition;
    increment)
     ...
...
...
```

11:38 46:38

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Let's Count Problem - Comparing the Two Solutions

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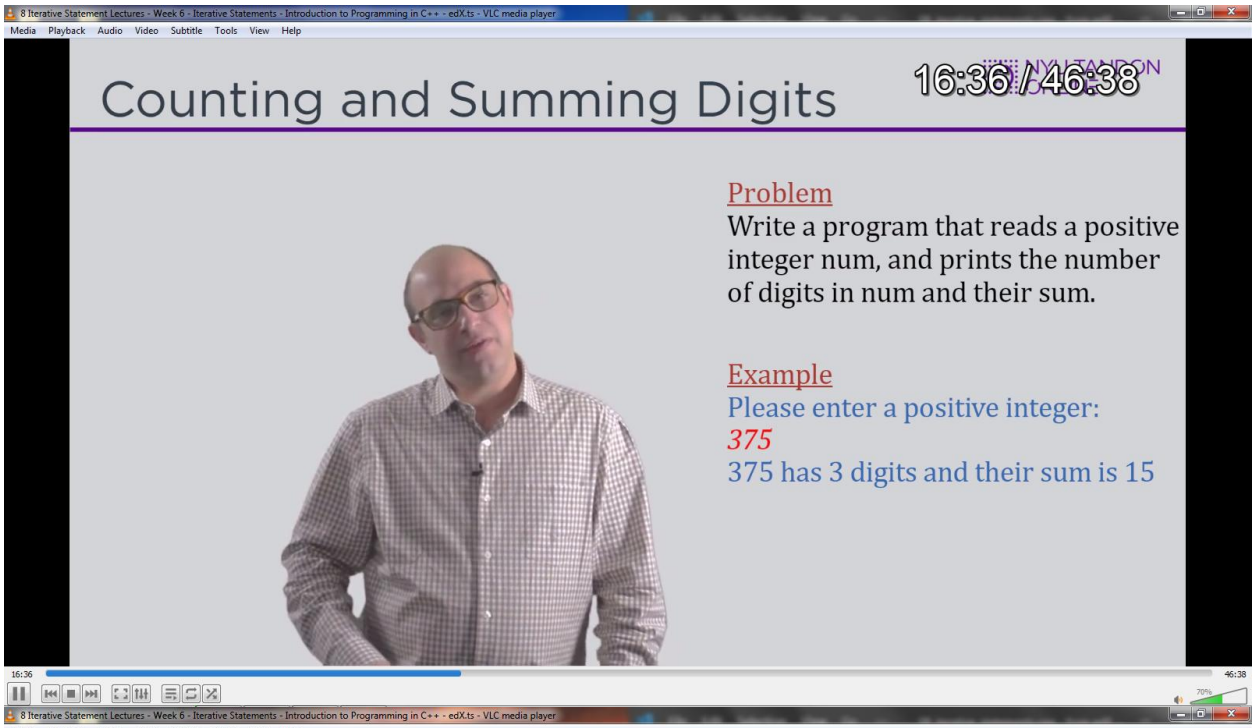
```
int main(){
     int n;
     int counter;
     cout<<"Please enter a positive
integer:";
     cin>>n;
     counter = 1;
     while(counter <= 4){
          cout<<counter<<endl;
          counter++;
     }
     return 0;
}
```

```
int main(){
     int n;
     int counter;
     cout<<"Please enter a positive
integer:";
     cin>>n;

     for(counter = 1; counter <= 4;
         counter++){
          cout<<counter<<endl;
     }
     return 0;
}
```

14:51 46:38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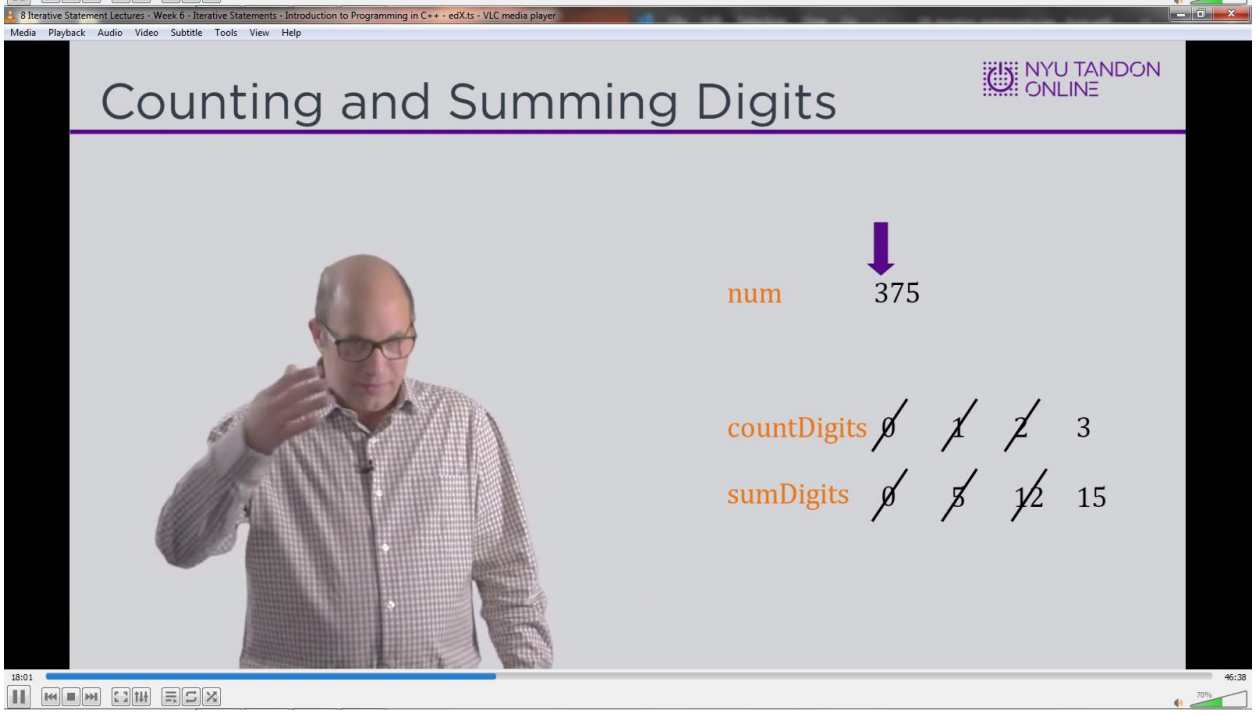
Counting and Summing Digits
16:36 / 46:38
Problem
Write a program that reads a positive integer num, and prints the number of digits in num and their sum.
Example
Please enter a positive integer:
375
375 has 3 digits and their sum is 15
16:36
46:38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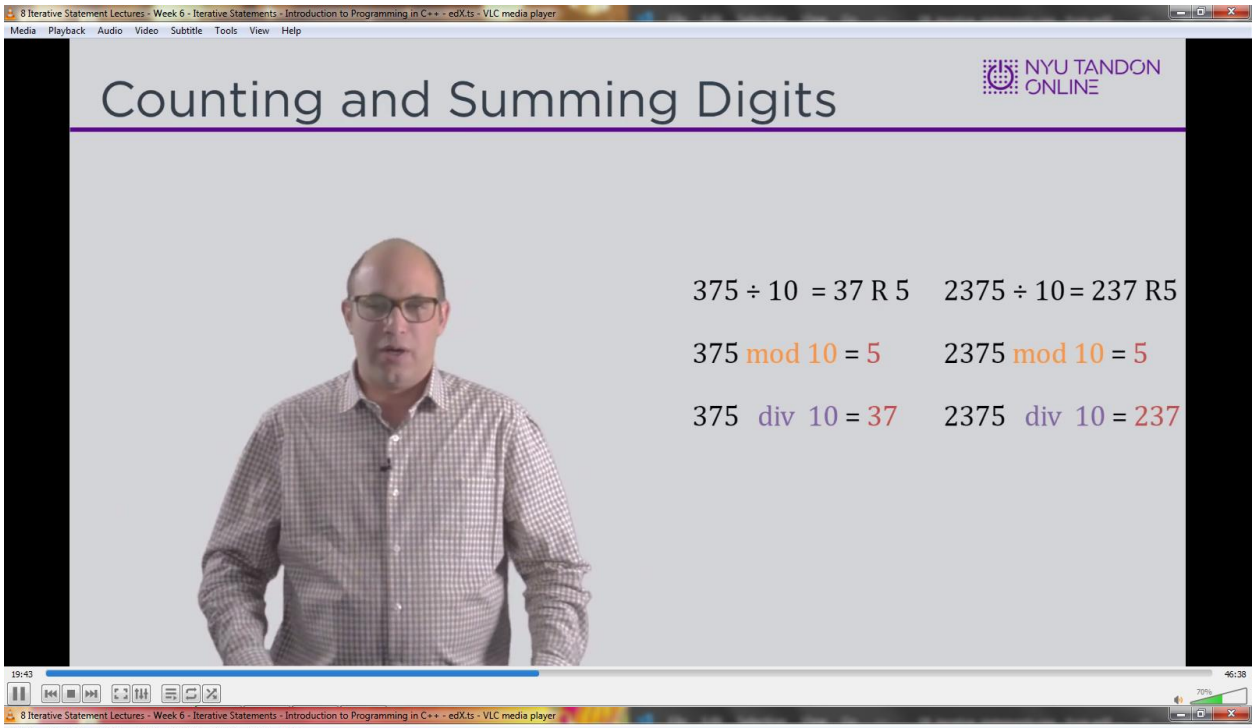
Counting and Summing Digits
NYU TANDON ONLINE
num 375
countDigits 0 1 2 3
sumDigits 0 5 12 15
18:01
46:38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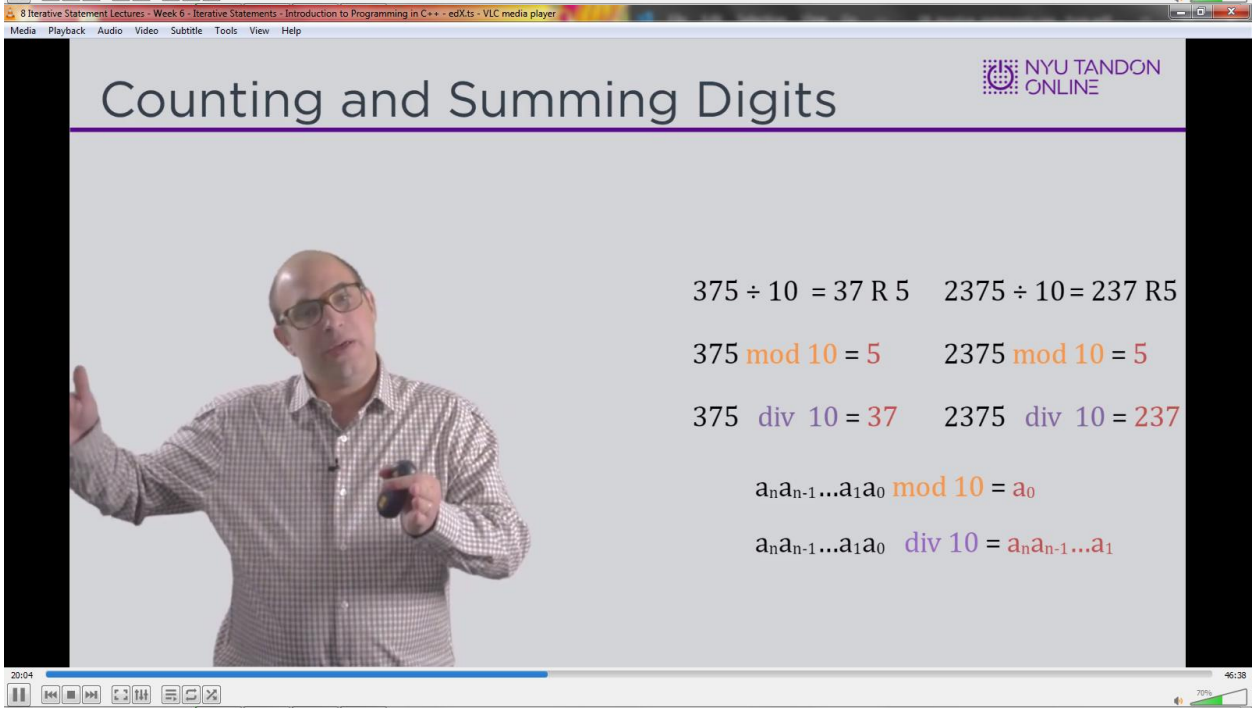
Counting and Summing Digits
NYU TANDON ONLINE
375 ÷ 10 = 37 R 5
2375 ÷ 10 = 237 R5
375 mod 10 = 5
2375 mod 10 = 5
375 div 10 = 37
2375 div 10 = 237
19:43
46:38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Counting and Summing Digits
NYU TANDON ONLINE
375 ÷ 10 = 37 R 5
2375 ÷ 10 = 237 R5
375 mod 10 = 5
2375 mod 10 = 5
375 div 10 = 37
2375 div 10 = 237
$a_n a_{n-1} \ldots a_1 a_0$ mod 10 = a_0
$a_n a_{n-1} \ldots a_1 a_0$ div 10 = $a_n a_{n-1} \ldots a_1$
20:04
46:38

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Counting and Summing Digits

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num	~~375~~	~~37~~	~~3~~	0
currDigit	~~5~~	~~7~~	3	
countDigits	~~0~~	~~1~~	~~2~~	3
sumDigits	~~0~~	~~5~~	~~12~~	15

21:20 46:38

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Computing The Average

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Problem

Write a program that reads grades of students in a class, and prints the average.

Example

Please enter the number of students in the class:

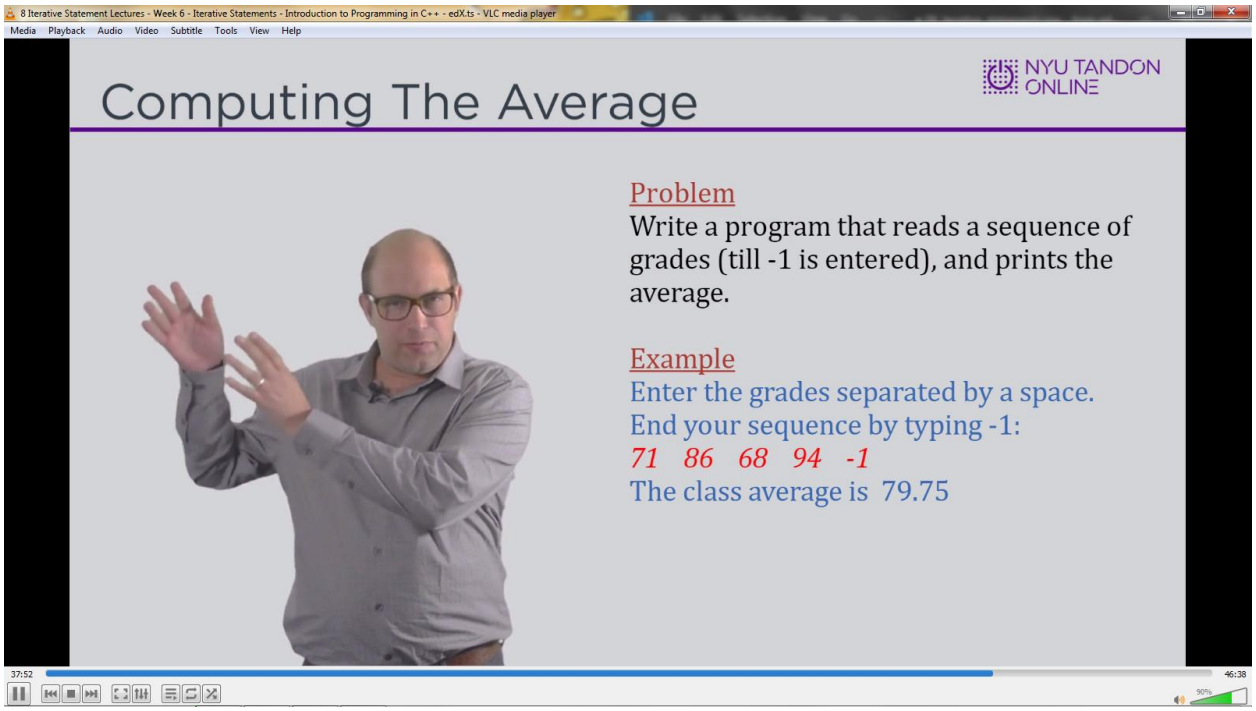
4

Enter the students' grades (separated by a space):

71 86 68 94

The class average is 79.75

28:55 46:38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Computing The Average
NYU TANDON ONLINE
Problem
Write a program that reads a sequence of grades (till -1 is entered), and prints the average.
Example
Enter the grades separated by a space.
End your sequence by typing -1:
71 86 68 94 -1
The class average is 79.75
37:52
46:38