

FLOATS AND LOOPS

Problem Solving with Computers-I

C++

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

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



C++ types in expressions

```
int i = 10;
```

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

What is printed by the above code?

A. 0

B. 0.1

C. 1

D. None of the above

Setting up output when printing doubles

See pages 91 and 190 of textbook

```
int i =10;
double j = 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<<j;
```

What is printed by the above code?

A. 0

B. 0.1

C. 0.10

D. 0.100

E. None of the above

C++ for loops

A for loop is used to repeat code (usually a fixed number of times)

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

While loops

A while loop is used to repeat code while some condition is true

do-while loops

A while loop that executes at least once!

Nested for loops – ASCII art!

Write a program that draws a square of a given width

```
./drawSquare 5
```

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


Draw a triangle

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

```
./drawTriangle 5
```

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

```
6   for(int j = 0; j < n; j++){ //A
7       for(int i=0; i < n; i++){ //B
8           cout<<"* "; //C
9       }
10      cout<<endl; //D
11  }
12  cout<<endl; //E
13
```

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++;
```

Brute-force search

Horses cost \$10, pigs cost \$3, and rabbits are only \$0.50. A farmer buys 100 animals for \$100, How many of each animal did he buy?

Brute-force: just try all the possibilities until you find the answer!