FLOATS AND LOOPS

Problem Solving with Computers-I

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+ 1/2+ 1/3+ ….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!