Section Access Code**:** DEAN-25143-FRFD-30

**REGISTRATION INSTRUCTIONS FOR STUDENTS:**  
  
1) Go to [www.tcgo1.com](http://www.tcgo1.com) OR [www.tcgo2.com](http://www.tcgo2.com)  
2) Click **'Register for CodeLab'**  
3) Enter your email info, then confirm you are not a robot  
4) Enter the Section Access Code (DEAN-25143-FRFD-30) and click **CONTINUE**  
  
**LOGIN INSTRUCTIONS FOR STUDENTS:**  
  
1) Go to [www.tcgo1.com](http://www.tcgo1.com) OR [www.tcgo2.com](http://www.tcgo2.com)  
2) Click **'Login to CodeLab'**  
  
The username is the email address given during registration.  
The password is the password selected during registration.\

**CodeLab exercises, by week**:

**Week 1-2** 60143, 60053, 60054, 60055, 60176, 60177, 60178, 60181, 60182, 60105

60099, 10995, 60104, 10516, 60106, 60110, 10933, 10936, 10607, 60112, 10935, 10965

**Week 3-4** 60102, 60103, 10898, 10505, 11006, 10525, 10904, 10948, 10549, 11035, 11034, 11039

10554, 10601, 10600, 10907, 10596, 10599, 11058, 10553, 10557, 10561, 10562, 10564

**Week 5-6** 10565, 11062, 10560, 10563, 11074, 10917, 10543, 10544, 10576, 11127, 10572, 10573

Loops examples!!!!

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , use a [while loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to print a single line consisting of 97 asterisks. Use no [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  other than k.

A; k = 97;

while(k>0){

cout<<"\*";

k--;

}

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  n that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , write some code that repeatedly reads a [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  into n [until](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  at last a number [between](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  1 and 10 (inclusive) has been entered.

A: while ( n > 10 || n < 1 ) {

cin >> n;

}

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k and total that have [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , use a [do...while loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to compute the [sum](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the **squares** of the first 50 counting numbers, and [store](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  this [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in total. Thus your code should put 1\*1 + 2\*2 + 3\*3 +... + 49\*49 + 50\*50 into total. Use no [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  other than k and total.

A; total=0;

k=1;

do{

total += k\*k;

k++;

}while (k<=50);

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  n that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to a positive [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and another [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  j that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , use a [do...while loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to print a single line consisting of n asterisks. Thus if n contains 5, five asterisks will be printed. Use no [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  other than n and j.

A; j=1;

do{

cout << "\*";

j++;

}

while (j<=n);

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , use a [for loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to print a single line consisting of 97 asterisks. Use no [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  other than k.

A; for (k=1;k<=97;k++){

cout << "\*";

}

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  n that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to a positive [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and another [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  j that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , use a [for loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to print a single line consisting of n asterisks. Thus if n contains 5, five asterisks will be printed. Use no [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  other than n and j.

A; for (j = 0; j < n; j++)

{

cout << "\*";

}

Write a [for loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that prints all the **even** [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  from 80 through 20 inclusive, separated by spaces.

A; for (int i=80; i>=20; i--){

if ((i % 2)==0){

cout << i << " ";

}

}

Write a [for loop](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that prints, in ascending order, all the positive [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [less than](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  200 that are divisible by both 2 and 3, separated by spaces.

A; for (int i=1; i<200; i++){

if ((i%2)==0 && (i%3)==0){

cout << i << " ";

}

}

COUNTERS!!

[Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that two **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [constants](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ,FIRST\_YEAR and LAST\_YEAR have [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  with year [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  (like 2009, 2014), along with a [**double**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  oil that has been [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  with the number of barrels of oil consumed in Canada in the year [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  by FIRST\_YEAR. Write some code that uses a [**while** statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to print on a line by itself, each of the years from FIRST\_YEAR to LAST\_YEARinclusive. On each line, after the year, separated by a colon and a space, print the new [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  amount of oil, taking into account that each year the oil consumed [increases](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  by 20%.

int currentYear = FIRST\_YEAR;

while (currentYear <= LAST\_YEAR) {

cout << currentYear++ << ": " << oil << '\n';

oil \*= 1.2;

}

KEEPING A RUNNING TOTAL!!!!

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [increments](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  total by the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  amount. That is, add the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of amount to total and [assign](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the result to total.

A;total+=amount;

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that two [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , total and amount, have been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , write a sequence of [statements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that:

[**initializes**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  total to 0

reads three [**values**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  into amount, one at a time.

After each [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is read in to amount, it is added to the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in total (that is, total is [incremented](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  by the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in amount).

A: total=0;

for (int i=1; i<=3; i++){

cin >> amount;

total += amount;

}

SENTINELS!!!!!

Write a loop that reads positive [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  from standard input and that terminates when it reads an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that is not positive. After the [loop terminates](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , it prints out the [sum](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of all the even [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  read and the [sum](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of all the odd [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  read(The two [sums](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  are separated by a space). [Declare](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  any [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that are needed.

A; int odd=0;

int even=0;

int i=1;

while (i>0){

cin >> i;

if ((i % 2)==0 && (i>0)){

even+=i;

}

if ((i % 2)!=0 && (i>0)){

odd+=i;

}

}

cout << even << " " << odd;

You need to write a loop that will repeat exactly 125 times. Which is the preferred loop construct to use? A:for loop

You need to write a loop that will keep reading and adding integers to a sum, until the sum reaches or exceeds 21. The numbers are all less than 20 and the sum is initially 0. Which is the preferred loop construct to use?A: Do while loop

You need to write a loop that reads integers and adds them to a sum as long as they are positive. Once 0 or a negative value is read in your loop terminates. Which is the preferred loop construct to use?A: while loop

You have a variable, n, with a non-negative value, and need to write a loop that will keep print n blank lines. What loop construct should you use?A: for loop

Write a loop that displays all possible combinations of two letters where the letters are 'a', or 'b', or 'c', or 'd', or 'e'. The combinations should be displayed in ascending alphabetical order:  
aa,ab,ac,ad,ae,ba,bb,...,ee

A: for (char outerChar='a'; outerChar<='e'; outerChar++){

for (char innerChar='a'; innerChar<='e'; innerChar++){

cout << outerChar << innerChar << "\n";

}

}

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that terminates the current loop when the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  x. and y.are [equal](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)

A: if(x == y){  
 break;  
}

CHAPTER 6: FUNCTIONS!!!!!

printTodaysDate is a function that accepts no [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns no [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that calls printTodaysDate.

A: printTodaysDate();

Write the definition of a function printDottedLine, which has no [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and doesn't return anything. The function prints to [standard output](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a single line (terminated by a new line [character](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ) consisting of 5 periods.

A: void printDottedLine()

{cout << "....." << endl;

}

SENDING DATA TO A FUNC. !!

Write the definition of a function printGrade, which has a [char](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns nothing. The function prints on a line by itself the [message](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [string](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  Grade: followed by the [char](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  (printed as a [character](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ) to [standard output](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . Don't forget to put a new line [character](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  at the end of your line.

Thus, if the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 'A', the function prints out Grade: A

A: void printGrade(char grade){

cout << "Grade:" << grade << endl;

}

The Return Statement!!

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that a function receives three [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a, b, c, of [type](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [**double**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?), write some code, to be included as part of the function, that determines [whether](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of "b squared" – 4ac is negative. If negative, the code prints out the [message](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  "no real solutions" and returns from the function.

A; if (b\*b < 4\*a\*c){ cout << "no real solutions"; }

Returning a value from a function!!

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [declares](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a prototype for a function twice, which has an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A:int twice(int);

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [declares](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a prototype for a function add, which has two [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A:int add(int,int);

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [declares](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a prototype for a function powerTo, which has two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The first is a [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the second is an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns a [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A:double powerTo(double,int);

Write the definition of a function oneLess, which receives an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that is one [less than](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . So if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 7, the function returns the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  6. If the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  happens to be 44, the functions returns the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  43.

A:int oneLess(int amount){

   return amount - 1;

}

Write the definition of a function half, which receives an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that is half the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . (Use [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  division!) So if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 7, the function returns the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  3. If the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  happens to be 44, the functions returns the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  22.

A: int half (int input){  
 return input / 2;  
}

Write the definition of a function twice, that receives an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that is twice the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of that [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: int twice (int input){

return input \* 2;

}

Write the definition of a function add, which receives two [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns their [sum](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: int add (int a, int b){

return a+b;

}

Returning Boolean value

Write the definition of a function isSenior, that receives an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is greater or [equal](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to 65, and [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  otherwise.   
  
So, if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 7 or 64 or 12 the function returns [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . But if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 69 or 83 or 65 the function returns [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: bool isSenior(int age){ return age>=65; }

Static local variables

Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  **averager**that receives a [**double**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns-- as a [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  -- the average [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that it has been passed so far. So, if you make these calls to average, averager(5.0), averager(15.0), averager(4,3), the [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  returned will be (respectively): 5.0, 10.0, 8.1.

A: double averager (double x)

{

static double count = 0; count++; count+=1; static double y = 0; y+=x; y+=x;

return y/count;

}

Using reference variables as Parameters

[Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a function addOne that accepts a single [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  reference [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns nothing. Call the function, passing it the [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  i which has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: addOne(i);

Write the header for a function addOne that accepts a single [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  reference [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns nothing. [Name](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  x.

A: void addOne(int &x)

Write a function addOne that adds 1 to its [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  reference [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns nothing.

A: void addOne(int& num){

num = num + 1;

}

Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  maxmin that is passed four **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [arguments](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns nothing but [stores](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [larger](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the first two [arguments](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the third [argument](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  it receives and the the smaller of the first two [arguments](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in its fourth [argument](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . So, if you invoke maxmin(3,7,x,y), upon return x will have the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  7 and y will have the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  3.

A: void maxmin(int iVal1, int iVal2, int& x, int& y){

if (iVal1 > iVal2) {

x = iVal1;

y = iVal2;

}else {

x = iVal2;

y = iVal1;

}

}

[Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  swapdoubles has been defined and is available for use in this exercise: that function receives two [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [type](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [**double**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) and exchanges their [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  sort3 that is passed three [**double**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns nothing but modifies the [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of these [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  so they are in sorted order. So, if a, b and c have (respectively) the [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  3.14, 2.71, and 3.04, and the invocation sort3(a,b,c) is made, then upon return, the [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of a, b and c will be 2.71, 3.04, and 3.14 respectively.

A: void sort3 (double &a, double &b, double &c){

if (a>b) swapdoubles (a,b);

if (b>c) swapdoubles (b,c);

if (a>b) swapdoubles (a,b);

}

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  i, [declare](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a [reference variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  r that is a reference to i.

A: int& r = i;

Using files for data storage

Write the necessary preprocessor directive to enable the use of file streams.

A: #include <fstream>

Define an [object](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  outfile that can be used to write data from [program](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to a file.

A: ofstream outfile;

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  x write some [statements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that attempt to open a file [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  "table20" and read a [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  into x; if that turns out not to be possible your code should then read avalue from standard input into x.

A: ifstream filename;

filename.open("table20");

if (filename.fail()){

cin >> x;

}else{

filename >> x;

}

Write the definition of a function powerTo, which receives two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The first is a [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the second is an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns a [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

If the second [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is negative, the function returns 0. Otherwise, it returns the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the first [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  raised to the power of the second.

A: double powerTo(double x, int y)

{

double result=1;

if( y < 0)

return 0;

else

for (int i=0; i < y; i++){

result = result\*x;

}

return result;

}

Write the definition of a function signOf, that receives an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns a -1 if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is negative, returns 0 if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 0 and returns 1 if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is positive.   
  
So, if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 7 or 803 or 141 the function returns 1. But if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is -22 or -57, the function returns -1. And if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 0, the function returns 0.

A: int signOf(int num)

{if (num<0)

return -1;

else if (num==0)

return 0;

else

return 1;}

Write the definition of a function isPositive, that receives an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is positive, and [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  otherwise.   
  
So, if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is 7 or 803 or 141 the function returns [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . But if the [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is -22 or -57, or 0, the function returns [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: bool isPositive(int x)

{

if (x > 0) {

return true;

} else {

return false;

}

}

Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  newbie that receives no [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns [**true**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) the first time it is invoked (when it is a "newbie"), and that returns [**false**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) every time that it is invoked after that.

A: bool newbie()

{

static bool x = true;

if (x) {

x=false;

return true;

} else {

return false;

}

}

Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  max that receives an [**int**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and returns the largest [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that it has been called with so far. So, if you make these calls to max, max(5), max(3), max(12), max(4), the [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  returned will be (respectively): 5, 5, 12, and 12.

A: int max (int num){

static int MaxV=0;

if (num > MaxV)

MaxV=num;

return MaxV;

}

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that corpdata is an ifstream [object](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that has been used for reading data and that there is no more data to be read, write the necessary code to complete your use of this [object](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: corpdata.close();

Use an ifstream [object](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  indata to read the first three [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  from a file called lottowins and write each number to [standard output](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , on a line by itself. [Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that this is the extent of the input that this [program](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  will do.

A: int num1,num2,num3;

indata.open("lottowins");

indata >> num1;

cout << num1 << endl;

indata >> num2;

cout << num2 << endl;

indata >> num3;

cout << num3 << endl;

indata.close ();

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the availability of an ifstream [object](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  indata and an ofstream [object](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  outdata, write the other [statements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  necessary to read one [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  from a file called currentsales and write twice its [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  into a file called projectedsales. [Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that this is the extent of the input and [output](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that this [program](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  will do.

A: double sales=0.0;

indata.open("currentsales");

outdata.open("projectedsales");

indata >> sales;

outdata << sales \* 2.0;

indata.close();

outdata.close();

[Declare](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  scores of twenty-five [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [type](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: int scores[25];

[Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  salarySteps that contains exactly five [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

Write a single [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to [assign](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  30000 to the **first**  [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of this [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: salarySteps[0]=30000;

[Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a that contains exactly five [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

Write a single [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a new [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to the **first**  [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . This new [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  should be [equal](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to twice the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [stored](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the **last**  [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

Do **not** modify any [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  other than the first [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A:a[0]=2\*a[4];

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to [declare](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialize](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  denominations that contains exactly six [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .   
  
Your [declaration](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  should [initialize](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to the following [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) : 1, 5, 10, 25, 50, 100. (The [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  1 goes into the first [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ; the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  100 to the last.)

A: int denominations[6]= {1, 5, 10, 25, 50, 100};

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  temps of [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , containing temperature data, and an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  n that contains the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in temps:   
  
Compute the average temperature and [store](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  it in a [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  called avgTemp.   
  
Besides temps, n, and avgTemp, you may use only two other [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  -- an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k and a [double](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  total, which have been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: total=0;

for (k=0; k<n; k++) {

total += temps[k];

}

avgTemp =total/n;

We informally define the term "corresponding [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) " as follows: The first [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the last [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  are **corresponding** [**elements**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?). Similarly, the second [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  just before the last [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  are corresponding [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The third [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  just before the [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  just before the last [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  are corresponding [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  -- and so on.

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a and a [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  n that contains the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in a, write an [expression](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  for the corresponding [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of a[i].

A: a[n-1-i]

Reversing the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  involves swapping the corresponding [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) : the first with the last, the second with the next to the last, and so on, all the way to the middle of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . [Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a, an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  n containing the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in a, and two other [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , k and temp, write a loop that reverses the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . Do not use any other [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  besides a, n, k, and temp.

A: for (int k=0; k<n/2; k++){

temp=a[k];

a[k]=a[n-k-1];

a[n-k-1]=temp;

}

An [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  parkingTickets has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to the number of parking tickets [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  out by the city police each day since the beginning of the current year. (Thus, the first [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  contains the number of tickets [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  on January 1; the last [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  contains the number of tickets [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  today.)   
  
A [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  ndays has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to hold the size of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . (Thus, if today were January 18, ndays would have the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  18; if today were February 3, ndays would have the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  34.)   
  
In addition, a [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  mostTickets has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , along with a [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k.   
  
Without using any additional [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and without changing the [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of ndays or the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the parkingTickets [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , write some code that results in mostTickets containing the largest [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  found in parkingTickets.

A: mostTickets=0;

for (k=0; k< ndays; k++){

if (parkingTickets[k]>mostTickets) mostTickets=parkingTickets[k];

}

printArray is a function that has two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The first [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [type](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the second is an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function prints the contents of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ; it does not return a [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

inventory is an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) s that has been [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and filled with [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . n is an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that holds the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that prints the contents of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  inventory by calling the function printArray.

A: printArray(inventory,n);

Write a [statement](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [declares](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a prototype for a function **printArray,** which has two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The first [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [type](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the second is an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function does not return a [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: void printArray(int [ ], int);

Write the definition of a function **printArray,** which has two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The first [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and the second is an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function does not return a [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function prints out each [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , on a line by itself, in the order the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  appear in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and does not print anything else.

A: void printArray (int s[],int n){

for (int k=0; k<n; k++){

cout << s[k] << endl;

}

}

Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  sumArray that receives two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) : an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [type](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that contains the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns the [sum](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  as an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: int sumArray (int s[], int n){

int sum=0;

for(int k=0; k<n; k++){

sum += s[k];

}

return sum;

}

Write the definition of a function, isReverse, whose first two [parameters](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  are [arrays](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [equal](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  size, and whose third [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  indicating the size of each [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function returns [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  if and only if one [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is the reverse of the other. ("Reverse" here means same [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  but in reverse order.)

A: bool isReverse (int one[], int two[], int size){

int matches=0;

for (int k=0; k<size; k++){

if (one[k] == two[size-k-1]){

matches++;

}

}

if (matches==size){

return true;

}else{

return false;

}

}

Write the definition of a function reverse, whose first [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and whose second [parameter](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function reverses the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . The function does not return a [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: void reverse (int a[], int n){

int temp;

for (int k=0; k<n/2; k++){

temp=a[k];

a[k]=a[n-k-1];

a[n-k-1]=temp;

}

}

[Given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) :

* an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)**  [**variable**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k,
* an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)**  [**array**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  currentMembers that has been [**declared**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [**initialized**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ,
* an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)**  [**variable**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  nMembers that contains the number of [**elements**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [**array**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ,
* an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)**  [**variable**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  memberID that has been [**initialized**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and
* a bool  [**variable**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  isAMember,

Write code that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to isAMember if the [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of memberID can be found in currentMembers, and that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to isAMemberotherwise.   
  
Use only k, currentMembers, nMembers, and isAMember.

A: isAMember=false;

for (k=0; k<nMembers; k++)

if (currentMembers[k] == memberID){

isAMember=true;

break;

}

You are [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  k, an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  zipcodeList that has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  nZips that contains the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in zipcodeList, and a bool  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  duplicates.Write some code that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to duplicates if there are two adjacent [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that have the same [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to duplicates otherwise. Use only k, zipcodeList, nZips, and duplicates.

A: duplicates=false; for (k=0; k<nZips-1; k++){

if (zipcodeList[k]==zipcodeList[k+1]){

duplicates=true;

break;

}

}

You are [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  two [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variables](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  j and k, an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  zipcodeList that has been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , an [int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  nZips that contains the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in zipcodeList, and a bool  [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  duplicates. Write some code that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to duplicates if **any** two [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  have the same [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and that [assigns](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to duplicatesotherwise. Use only j, k, zipcodeList, nZips, and duplicates.

A: duplicates=false;

for (k=0; k<nZips; k++)

for (j=0; j<k; j++)

{

if ( zipcodeList[j]==zipcodeList[k])

{

duplicates=true;

break;

}

}

Write the definition of a function [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  **isSorted** that receives three [arguments](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) : an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)**, an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** that indicates the number of [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of interest in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and a **bool**.  
  
If the **bool** [argument](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is [**true**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) then the function returns [**true**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) if and only if the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is sorted in ascending order. If the **bool** [argument](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is [**false**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)then the function returns [**true**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) if and only if the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is sorted in descending order. In all other cases the function returns [**false**](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?).  
  
You may [assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  has at least two [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: bool isSorted(int a[], int n, bool status){

bool flag = true;

if(status == true){

for (int i=0; i<n-1; i++)

if (a[i] > a[i+1])

flag = false;

}else{

for (int i=n-1; i > 0; i--)

if (a[i] > a[i-1])

flag = false;

}

return flag;

}

In this exercise, you will write some code that reads n unique (no duplicates!) non-negative [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , each one [less than](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  fifty (50). Your code will print them in sorted order without using any nested loops-- potentially very efficient! We'll walk you through this:  
First, [assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  you are [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  **n**, that contains the number of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to read from standard input.  
Also [assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  you are [given](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , [named](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  wasReadIn, of fifty (50) bool [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialize](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  all the [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to [false](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .  
Third, read in the n [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  from the input, and each time you read an [integer](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , use it as an index into the bool [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , and [assign](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to be [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) -- thus "marking" in the [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  which numbers have been read.  
Lastly the "punchline": write a loop that traverses the bool [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) : every time it finds an [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that is [true](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  it prints out the [element](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) 's INDEX -- which was one of the [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  read in. Place all the numbers on a single line, separated by a single spaces. Note: this technique is not limited to 50 [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) -- it works just as well for [larger](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . Thus, for example you could have an [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  of 1,000,000 [elements](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  (that's right-- one million!) and use it to sort numbers up to 1,000,000 in [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) !

A: int number;

for (int i=0; i<50; i++){

wasReadIn[i]=0;

}

for (int i=0; i<n; i++){

cin >> number;

wasReadIn[number]++;

}

for(int i=0; i<50; i++){

if(wasReadIn[i]>0){

for(int j=0; j<wasReadIn[i]; j++){

cout << i << " ";

}

}

}

[Assume](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  you have a **[int](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)** [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  **n** that has [already](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  been [declared](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and [initialized](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . Its [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  is the number of [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that need to be read in from standard input and printed out in sorted (ascending) order, each on a line by itself. Furthermore, there are no duplicates in the input and every number to be read is a non-negative [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  that is [less than](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  **n**'s [value](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .   
  
In this exercise you may not use any [array](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  (or fancy STL collection such as a vector). You may [declare](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  a [variable](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  or two as needed. With these restrictions, read the **n** [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  and print them out as required onto [standard output](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) .

A: int x=0;

for (int i=0; i<n; i++){

cin >> x;

cout << i << "\n";

}

Write a fragment of code that reads in [integers](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  from standard input, [until](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  end-of-file and sends their ([floating point](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) ) average to [standard output](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) . If no numbers are input, the [message](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  “no [values](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?)  to average” is printed instead ([while loops](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) , end-of-file processing, mixed-mode arithmetic, basic [conditional](https://codelab3.turingscraft.com/codelab/jsp/core_dhtml.jsp?) )

A: float number=-1;

float count=0;

float sum=0;

while(cin.eof()==false){

cin >> number;

sum += number;

count++;

}

if(number==-1){

cout << "no values to average";

}

else{

if (count>0)

cout << sum/count;

}

10831, 10832, 10582, 10581, 11130, 10587, 10588, 11131, 11134, 11136, 60129, 60130

**Week 7-8** 11142, 11146, 10639, 10654, 10655, 11080, 10649, 10650, 10651, 10909, 10910, 10661

10913, 10658, 10659, 10914, 10915, 11084, 11085, 11087, 10664, 10665, 10666, 11089

**Week 9-10** 11090, 10663, 11040, 11041, 11049, 11076, 11053, 11052, 10609, 10610, 10619, 10628

10613,10629, 10630, 10631, 10638, 10984, 10646, 10652, 10662, 10669, 10670, 10671,

**Week 11** 10632, 10633, 10634, 10635, 11193, 10552, 11189, 11186, 11188, 11190, 11191, 11192