

**Exercise 60**

Write the definition of a (appropriately named) function which takes two real numbers as input, and outputs their arithmetic mean. Write a complete program which uses the function such as the following example.

```
Enter two real numbers: 3 7
The arithmetic mean of 3 and 7 is 5.
```

**Exercise 61**

Write the definition of a function which takes a character as input and returns its ASCII code. Write a complete program which uses the function as follows.

```
Enter a character: X
The ASCII code for X is 88.
```

**Exercise 62**

Modify the program you wrote for Exercise 60 so that a user can request the arithmetic mean of an arbitrary number of pairs of reals, as follows.

```
Enter two real numbers: 3 7
The arithmetic mean of 3 and 7 is 5.
Would you like to continue? (y/n) y
Enter two real numbers: -3.2 7.8
The arithmetic mean of -3.2 and 7.8 is 2.3.
Would you like to continue? (y/n) n
Thank you!
```

**Exercise 63**

Write the definition of a function max which returns the larger of two integers.

**Exercise 64**

Write a program which takes 3 integers as input, and outputs the integers sorted from least to greatest.

```
Enter three integers: -3 7 4
Sorted from least to greatest the integers are -3, 4, 7.
```

**Exercise 65**

Given the functions

```
char convert1(char c) {return c;}
int convert2(char c) {return c;}
```

(a) Give the output of the following code.

```
cout<<convert1('X')<<convert2('X')<<endl;
```

(b) Explain why the output is what it is.

**Exercise 66**

Give the output of the following code.

```
string name="Roy G. Biv";
name[0]='C'; name[5]='!';
```

```
cout<<name;
```

### Exercise 67

Which of the following functions might be used to determine whether a person is at least 21 years old?

- (a) `bool islegal(int age) { return age<21; }`
- (b) `bool islegal(int age) { return age>21; }`
- (c) `bool islegal(int age) { return age<=21; }`
- (d) `bool islegal(int age) { return age>=21; }`

### Exercise 68

Write a for loop which prints all the upper-case letters of the alphabet. The only upper-case letters that are allowed in your code are A and Z. Your output should be as follows.

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

### Exercise 69

Same as Exercise 68, but in reverse order:

```
ZYXWVUTSRQPONMLKJIHGFEDCBA
```

### Exercise 70

Write a function `ispunc` which takes a character as input and returns `true` if, and only if, the character is a letter or digit.

### Exercise 71

Recall that the declaration

```
vector<int> nums(100);
```

creates a list of 100 integer variables, `nums[0]`, `nums[1]`, `nums[2]`, ..., `nums[99]`. The declaration

```
vector<int> nums(100,1);
```

creates a list of 100 integers where each integer is initialized to 1; that is, `nums[0]` is 1, `nums[1]` is 1, `nums[2]` is 1, etc... . Create a vector `nums` of 100 integers and assign values so that `nums[i]` is 1 if `i` is prime, and 0 otherwise. (Note: 0 and 1 are not prime.)