

Topics: Variables, Types and Operators

1. In C++ we have the following variable types: char, string, int, float, boolean. For each of them, give one example case in which it is reasonable to use exactly this variable type.

2. What is the difference between char and string?

3. What is the difference between float and int?

4. Write a program where you declare a float variable with the value 3.1415926535 (this is the widely used constant π) and pass it to an integer variable.

- a) What happens with its value?
- b) Can you get the same result as in a) without using an integer variable?

5. The basic types char, int, float and boolean can be used from scratch. This does not hold for strings. What do you have to add to your code to use strings?

6. Look at the following code:

```
int a,b,c,d;  
a = 7;  
b = 5;  
c = a/b;  
d = b/a;
```

- a) What are the values stored in the variables c and d?
- b) Based on a), how does the rounding of integers work?

7. Look at the following code:

```
float a=3,b=7,c=12;  
1 a = 5;  
2 b = a;  
3 c = a-b;  
4 b = 2*a-3;  
5 c = 1*(b-a);  
6 a = b/c;  
7 a = a*b*c-a;  
8 b = b+a;  
9 c = c;  
10 a = 2;  
11 b += a;  
12 c = b+a;  
13 b = a--;  
14 c = --a;
```

For each line 1-14, write down the values of the variable a,b,c after executing the line.

8. Which of the following operators can be used for strings and chars?

- a) ==
- b) >=
- c) <=
- d) >
- e) <

9. What happens if you compare (>=) an integer variable with a float? Does it work?

10. Write a condition that is true iff (iff means if and only if) the value of the variable lies within the interval (15,16,17,18,19,20).

Which variable type would you use? Write a program to test whether your condition code works properly.

11. Write a condition that is true when either your age is above 18 or your parents are with you (This condition could be used for a software that controls the entrance of an adult movie in a cinema) You will have to use two variables : age and parents. Write again a program that tests whether your condition works properly.

Which variable types would you recommend for age and parents? Why?

12. Can you add/subtract/multiply/divide strings? What happens?