

# 2012 ACM@UVA HSPC C++ Cheatsheet

## Primitive Data Types

int	32-bit signed two's complement integer
float	32-bit floating point number
double	64-bit floating point number
bool	Data type with two possible values: true or false
char	8-bit ASCII character

## Operations

+	Arithmetic addition or String concatenation
-	Arithmetic subtraction
/	Arithmetic division
%	Integer division remainder (modulus)
++	Increment
--	Decrement
==	Equality
!=	Inequality
<	Less than
>	Greater than
<=	Less than or equal
>=	Greater than or equal
&&	Logical AND
!	Logical NOT
	Logical OR

## Variable Declaration and Assignment

```
int    index    =    0;
TYPE   NAME     ASSIGNMENT  VALUE
```

## If Statement

```
if ( Boolean Expression ){
    Statements;
}
```

## While Loop

```
while ( Boolean Expression ){
    Statements;
}
```

## For Loop

```
for ( Initialization ; Termination ;
    Increment ){
    Statements;
}
```

## Strings

```
#include <string>
string a = "Uva";
    Creates the string a with value "Uva".
string b = "HSPC";
    Creates the string b with value "HSPC".
boolean falseValue = a.compare(b) ;
    a does not have the same value as b.
char letterU = a[0];
    The first character of a is the letter "U".
int zero = a.find("U");
    The letter "U" is the first character in the string a.
int minusOne = a.find("X");
    The letter "X" does not appear in the string, returning -1.
string uvaHSPC = a + b;
    The newly created string is "UVAHSPC".
```

## Arrays

```
int[] array = new int[size];
ARRAY TYPE  NAME      ARRAY LENGTH
```

```
array[index] = 50;
int fifty = array[index];
```

## Function Declaration

```
int    factorial    (int n)
RETURN TYPE  METHOD NAME  ARGUMENTS
```

```
int factorial(int n){
    /*body*/
}
```

# 2012 ACM@UvA HSPC C++ Cheatsheet

## Math

```
#include <math.h>
```

All return doubles. Angles are in radians.

<code>exp(1.0)</code>	The base of the natural logarithm.
<code>sin(ang)</code>	Computes the sine of ang.
<code>cos(ang)</code>	Computes the cosine of ang.
<code>tan(ang)</code>	Computes the tangent of ang.
<code>asin(ang)</code>	Computes the inverse sine of ang.
<code>log(a)</code>	The natural logarithm of a.
<code>sqrt(a)</code>	The square-root of a.
<code>pow(a,b)</code>	Raises a to the power of b.
<code>fabs(a)</code>	Returns the absolute value a.

## Input

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

```
cin >> declaredInt;
  Reads an integer from standard input.
cin >> declaredString;
  Reads a string from standard input.
cin >> declaredDouble;
  Reads a double from standard input.
```

## Output

```
cout << "Print the value : " << dog <<
endl;
  Prints out a the string and the value of the variable dog with
  a new line.
```

## Data Structures

### Vector

```
using namespace std;
#include <vector>
vector<int> list(20);
  Creates a new vector of integers .
list[0] = 1;
  Assigns the first element of the list to 1.
cout << list[0];
  Prints the first element of the list, the number 1.
```

### Map

```
using namespace std;
#include <map>
map<string,string> dict;
  Creates a mapping from strings to strings.
dict["Dog"] = "Cat";
  Maps the string "Dog" (key) to "Cat" (value).
cout << dict["Dog"] << "\n";
  Retrieves the value for the key "Dog" and prints the
  word "Cat".
```