Reference: Big C++.

Exercises 2:

Exercise R2.1.

s = s0 + v0\*t + .5\*g\*t\*t;

OR:

S = s0 + v0\*t + .5\*g\* pow(t,2);

…

G = 4\*pow(pi,2) \* pow(a,3) / (pow(p,2)\*(m1\*m2));

…

FV = PV \* pow((1+INT/100),YRS)

…

C = sqrt(pow(a,2)+pow(b,2)-2\*a\*b\*cos(y));

Exercise R2.3.

X1 = (-b – sqrt(b \* b – 4 \* a \*c)) / (2 \* a);

X2 = (-b + sqrt(b \* b – 4 \* a \*c)) / (2 \* a);

Exercise R2.4.

An overflow happens and random wrong results appears.

Example:

int overflow = 400.3 \* pow (10.5, 7);

Exercise R2.5.

1. n = x;

Means that only the integral part of x will be assigned to n, and the fractional part will be lost. The compiler will give a warning.

1. while n = static\_cast<int>(x + 0.5);

Guarantee that if the fractional part is less than 0.5, only the integral part will be assigned to n, else if 1 will be added to the integral part. The compiler will not give a warning.

Exercise R2.6.

Syntax errors:

1. The semicolon after int main()
2. Forgotten semicolon after cout stream.
3. Wrong cin stream construction.

Correct code: cin >> x >> y;

1. Forgotten quote in phrase (The sum of) and missed (<<) after the phrase ("is: ")
2. Return function return no value.

Correct code: return 0;

Exercise R2.7.

Logic errors:

1. Non-initialized variable total.
2. Line 9, assigned (total + x1) instead of (total + x2)
3. Line 10, total / 2 will produce integral value, to get the whole result total:

float average = total / 2.0;

#include <iostream>

using namespace std;

int main()

{

* 1. int total;
  2. int x1;
  3. cout << "Please enter a number:";
  4. cin >> x1;
  5. total = total + x1;
  6. cout << "Please enter another number:";
  7. int x2;
  8. cin >> x2;
  9. total = total + x1;
  10. float average = total / 2;
  11. cout << "The average of the two numbers is "
  12. << average << "\n";
  13. return 0;

}

Exercise R2.8.

2: is an integer

2.0: is treated as a floating point number

“2” is a string or more specifically a char.

“2.0” is a string

Exercise R2.9.

1. x = 2;

y = x + x;

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Will produce y = 4.

1. s = “2”;

t = s + s;

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Will produce a string t = “22”.

Exercise R2.10.

To get the first character of a string s:

s.substr (0, 1);

To get the last character of a string s:

s.substr (s.length () - 1);

To remove the first character of a string s:

s = s.substr (1);

To remove the last character of a string s:

s = s.substr (0, s.length () - 1);

Exercise R2.11.

To get the first digit:

* Get int x = log(number), means that the number is 10 to the power x.
* Divide the number by 10 to the power x.
* Store it into an integer variable.

To get the last digit:

Number % 10 = 6

Exercise R2.12.

1. fname: James

lname: Carter

age: 56

1. fname: Lyndon

lname: Johnson

age: 49

1. fname: Hodding

lname: Carter

age: random number

1. fname: Richard

lname: M.

age: random number

because the cin buffer wasn’t empty when it had token the names

Exercise R2.13.

1. x + n \* y – (x + n) \* y = 2.5 + 4 \* -1.5 – (2.5 + 4) \* -1.5 = 2.5 + (4 \* -1.5) – ((2.5 + 4) \* -1.5)

= 6.25

1. m / n + m % n = (18 / 4) + (18 % 4) = 4 + 2 = 6
2. 5 \* x – n / 5 = (5 \* 2.5) – (4 / 5) = 12.5
3. sqrt(sqrt(n)) = sqrt(sqrt(4)) = sqrt(2) = 1.4
4. static\_cast<int> (x + 0.5) = 3
5. s + t = “HelloWorld”
6. t + s = “WorldHello”
7. 1 - (1 - (1 - (1 - (1 - n)))) = 1 - (1 - (1 - (1 - (1 - 4)))) = 1 - (1 - (1 - (1 + 3))) = 1 - (1 - (1 - 4)) = 1 - (1 +3) = 1 - 4 = -3
8. s.substr(1, 2) = “el”
9. s.length() + t.length() = 10

Exercise R2.14.

A class is a data type that collects some data in one place and apply functions over them.

An object is an instance of this class.

Exercise R2.15.

1. object: Time()
2. object variable: Time t( \_ , \_ , \_ )

Exercise R2.16.

A member function is a function of class. It needs an object to invoke on it and it’s called using a dot nation.

A non-member function is a function that belongs to no class.

Exercise R2.17.

Point(3, 4); Constructs an object of type Point with a given coordinates

Point p(3, 4); Constructs an object variable of type Point with a given coordinates

Exercise R2.20.

Find the errors:

a. Time now();

b. Point p = Point(3, 4);

c. p.set\_x(-1); // No such a member function

d. cout << Time // cwin and Time variable name

e. Time due\_date(2004, 4, 15);

f. due\_date.move(2, 12);

g. seconds\_from(millennium); // No implicit parameter

h. Employee harry("Hacker", "Harry", 35000);

i. harry.set\_name("Hacker, Harriet"); // No such member function