2.24 C++ example: Salary calculation with variables

Using variables in expressions, rather than numbers like 40, makes a program more general and makes expressions more meaningful when read too.

zyDE 2.24.1: Calculate salary: Generalize a program with variables and input.

The following program uses a variable workHoursPerWeek rather than directly using 40 in the salary calculation expression.

1. Run the program, observe the output. Change 40 to 35 (France's work week), and run again.
2. Generalize the program further by using a variable workWeeksPerYear. Run the program. Change 50 to 52, and run again.
3. Introduce a variable monthlySalary, used similarly to annualSalary, to further improve program readability.

Load default template...

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

int main() {
   int hourlyWage;
   int workHoursPerWeek;
   int annualSalary;

   // TODO: Declare and initialize variable workWeeksPerYear, then replace the 50's below

   hourlyWage = 20;
   workHoursPerWeek = 40;

   annualSalary = hourlyWage * workHoursPerWeek * 50;
   cout << "Annual salary is: ";
   cout << annualSalary << endl;

}
```

Run

Feedback?

When values are stored in variables as above, the program can read user inputs for those values. If a value will never change, the variable can be declared as const.

zyDE 2.24.2: Calculate salary: Generalize a program with variables and input.

The program below has been generalized to read a user's input value for hourlyWage.

1. Run the program. Notice the user's input value of 10 is used. Modify that input value, and run again.
2. Generalize the program to get user input values for workHoursPerWeek and workWeeksPerYear (change those variables' initializations to 0). Run the program.
3. monthsPerYear will never change, so declare that variable as const. Use the standard for naming constant variables. Ex: const int MAX_LENGTH = 99. Run the program.
4. Change the values in the input area below the program, and run the program again.

Load default template...

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

int main() {
   int hourlyWage;
   int workHoursPerWeek;
   int workWeeksPerYear;
   int monthsPerYear;     // FIXME: Declare as const and use standard naming
   int annualSalary;
   int monthlySalary;

   cout << "Enter hourly wage: " << endl;
   cin >> hourlyWage;

   // FIXME: Get user input values for workHoursPerWeek and workWeeksPerYear
   workHoursPerWeek = 40;
   workWeeksPerYear = 50;
```

```
10
```

Run

Feedback?

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