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**WEEK 2 ASSIGNMENT**

Problem 1

Create a program that computes the elapsed time based on the velocity and the distance from the user's input!

For example, if the program takes the input the velocity of 40, dan the distance of 100, then output the value of 2.5.

Source code

#include<iostream>  
using namespace std;  
  
int main() {  
 //Declare the variables  
 double v, d, t;  
  
 //Input values to variables  
 cout << "Input the velocity (in km/h) \n";  
 cin >> v;  
 cout << "Input the distance (in km) \n";  
 cin >> d;  
  
 //Calculate the elapsed time  
 t = d/v;  
  
 //Print the result  
 cout << "Elapsed time is " << t << " hour";  
  
  
 return 0;  
}

Screenshot

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Penjelasan

We can easily divide distance by velocity to get the value of time.

Problem 2

Create a program that reads the two data in form of time, then computes the difference between the data! The dialogue is as the following:

* + Input the 1st hour data: …
  + Input the 1st minute data: …
  + Input the 2nd hour data: …
  + Input the 2nd minute data: …
  + Output: The difference between the two times is ... minutes

Assume that the first time is always earlier than the second time.

Source code

#include<iostream>  
using namespace std;  
  
int main() {  
 //Declare the variables  
 int a,b,c,d;  
 int first,second,diff;  
  
 //Input values to variables  
 cout << "Input the first hour data \n";  
 cin >> a;  
 cout << "Input the first minute data \n";  
 cin >> b;  
 cout << "Input the second hour data \n";  
 cin >> c;  
 cout << "Input the second minute data \n";  
 cin >> d;  
  
 //Calculate the time difference  
 first = a\*60 + b;  
 second = c\*60 + d;  
  
 diff = abs(first-second);  
  
 //Print the result  
 cout << "The difference between the two times is " << diff << " minutes";  
  
  
 return 0;  
}

Screenshot

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Penjelasan

First, we need to convert the hour value to minute and then subtract the second time by the first time, and we should get the time difference in minute.

Problem 3

Create a program that read two numbers, then prints those two numbers in reverse!

For example, if the input is "15 4" (without quotation mark), then the output is "4 15" (without quotation mark).

Source code

#include<iostream>  
using namespace std;  
  
int main() {  
 //Declare the variables  
 double a,b;  
  
 //Input values to variables  
 cout << "Input the numbers \n";  
 cin >> a >> b;  
  
 //Show the result  
 cout << b << " " << a;  
  
 return 0;  
}

Screenshot

Graphical user interface, text

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Penjelasan

We can easily swap the position of variables a and b in the cout syntax to get the output value swapped.

Problem 4

Create a program that reads a positive number, then prints the largest integer less than or equal to the input!

For example, if the input is  "9.4562" (without quotation mark), then the output is "9" (without quotation mark). If the input is  "10" (without quotation mark), then the output is "10" (without quotation mark).

Source code

#include<iostream>  
using namespace std;  
  
int main(){  
 //Declare the variable  
 int x;  
  
 //Input value to variable  
 cout << "Input number \n";  
 cin >> x;  
  
 //Show the result  
 cout << x;  
  
 return 0;  
}

Screenshot

Graphical user interface, text

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Penjelasan

We can simply use the data type int if we want to use bilangan bulat. The computer will ignore all the decimals because the data type int can only contain integer (bilangan bulat) value.

Problem 5

Given a sequence: 1, 3, 6, 10, 15, 21, 28, 36, ...

* + Determine the formula of given sequence!
  + Create a program that reads a number n, and prints the n-th term of given sequence! For example, if the input is 3, then the input is 6.
  + Try various inputs: 10, 100, 1000, 10000, 100000, 1000000. If the input is 100000 or 1000000, does the output match your expectation? If no, how does that happen? How to solve it so that the output match your expectation?

Source code

#include<iostream>  
using namespace std;  
  
int main(){  
 //Declare the variables  
 int n,x;  
  
 //Input the number n  
 cin >> n;  
  
 //Calculate the nth number of the sequence using for loop  
 for (int i; i<(n+1); i++) {  
 x += i;  
  
 }  
  
 //Show the result  
 cout << x;  
  
 return 0;  
}

Screenshot

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Penjelasan

* + Determine the formula of given sequence!

The formula to find Un is U(n-1) + n

Or we can also say the previous number added by n

This is because the pattern of the given sequence is A (the origin) = U1,  U2 ( U1 + 2),

U3 ( U2 + 3), U4 ( U3 + 4), and so on.

* + Create a program that reads a number n, and prints the n-th term of given sequence! For example, if the input is 3, then the input is 6.

To create a program that can return the nth number of the given sequence, we can use for loop to continuosly add the previous numbers and n until we get the desired Un.

* + Try various inputs: 10, 100, 1000, 10000, 100000, 1000000. If the input is 100000 or 1000000, does the output match your expectation? If no, how does that happen? How to solve it so that the output match your expectation?

All inputs satisfy the expected outputs except 100000 and 1000000,

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this is because the data type used (int) cannot contain such large number, it causes the number to loop back. In order to solve the issue, we can try change the data type to something that could contain more, namely double.

//Declare the variables  
double n,x;

The new outputs for 100000 and 1000000

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Although it doesn’t directly show the expected value, we can still derive the expected value from it