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Course: BSCS F19 (Afternoon)

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Subject: Programming Fundamental

# ASSIGNMENT NO # 01

**Algorithm Workbench**

**27. Conversion from pseudo code to C++**

#include <iostream>

using namespace std;

int main()

{

int speed = 0, time = 0, distance = 0;

speed = 20;

time = 10;

distance = speed \* time;

cout << "Distance: " << distance << endl;

return 0;

}

**28. Conversion from pseudo code to C++**

#include <iostream>

using namespace std;

int main()

{

float force = 0, area = 0, pressure = 0;

force = 172.5;

area = 27.5;

pressure = force / area;

cout << "Pressure: " << area << endl;

return 0;

}

**Find the Error**

1. No angle bracket around iostream.
2. Semi colon “;” after main ().
3. Instead of “}” there should be “{“.
4. No semi colon after three integers found.
5. Again, no semi colon after assigning value to a, b and operation c = a + b found.
6. “C” of Cout is capital it should be in smaller case as C++ case sensitive.
7. There should be “<<” in cout statement instead of “<” and at the end C should be in smaller case.
8. At the end opening brace “{“should replace on closing one “}”.

**The correct Program**

#include <iostream>

using namespace std;

int main ()

{

int a, b, c;

a = 3;

b = 4;

c = a + b;

cout << "The value of c is: " << c;

return 0;

}

**PROGRAMMING CHALLENGES**

**1. Sum of Two Numbers**

**Write a program that stores the integers 50 and 100 in variables, and stores the sum of these two in a variable named total**

#include<iostream>

using namespace std;

int main()

{

int a=50,b=100;

int total=a+b;

cout<<"The sum two integers is: "<<total<<endl;

return 0;

}

**2. Sales Prediction**

**The East Coast sales division of a company generates 58 percent of total sales. Based on that percentage, write a program that will predict how much the East Coast division will generate if the company has $8.6 million in sales this year.**

#include<iostream>

using namespace std;

int main()

{

float totalSales=8.6 ;

float eastCoastSales;

eastCoastSales=0.58\* totalSales;

cout<<"The east coast sell is: "<<eastCoastSales<<endl;

return 0;

}

**3. Sales Tax**

**Write a program that will compute the total sales tax on a $95 purchase. Assume the state sales tax is 4 percent and the county sales tax is 2 percent.**

#include<iostream>

using namespace std;

int main()

{

float purchase = 95;

float stateTax, countyTax;

stateTax = 0.04 \* purchase;

countyTax = 0.02 \* purchase;

cout << "State tax is: $" << stateTax <<endl;

cout << "County tax is: $" << countyTax <<endl;

cout << "Total tax is: $" << stateTax + countyTax;

return 0;

}

**4. Restaurant Bill**

**Write a program that computes the tax and tip on a restaurant bill for a patron with a $88.67 meal charge. The tax should be 6.75 percent of the meal cost. The tip should be 20 percent of the total after adding the tax. Display the meal cost, tax amount, tip amount, and total bill on the screen.**

#include <iostream>

using namespace std;

int main(){

float mealCost = 88.67;

float tax, tip, total;

tax = 0.0675 \* mealCost;

tip = 0.2 \* (mealCost + tax);

total = mealCost + tax + tip;

cout << "Meal Cost is $" << mealCost << endl;

cout << "Tax amount is $" << tax << endl;

cout << "Tip amount is $" << tip << endl;

cout << "Total Bill is $" << total << endl;

return 0;

}

**5. Average of Values**

**To get the average of a series of values, you add the values up and then divide the sum by the number of values. Write a program that stores the following values in five different variables: 28, 32, 37, 24, and 33. The program should first calculate the sum of these five variables and store the result in a separate variable named sum . Then, the program should divide the sum variable by 5 to get the average. Display the average on the screen.**

#include <iostream>

using namespace std;

int main(){

double var1, var2, var3, var4, var5;

double sum;

double average;

var1 = 28;

var2 = 32;

var3 = 37;

var4 = 24;

var5 = 33;

sum = var1 + var2 + var3 + var4 + var5;

average = sum/5;

cout << "The average is: " << average;

return 0;

}

**6. Annual Pay**

**Suppose an employee gets paid every two weeks and earns $2,200 each pay period. In a year the employee gets paid 26 times.**

**Write a program that defines**

**payAmount**

**payPeriod**

**annualPay**

**and display the result.**

#include <iostream>

using namespace std;

int main()

{

float payAmount = 2200.0, payPeriod = 26, annualPay= 0.0;

annualPay = payAmount \* payPeriod;

cout << "Total annual Pay: " << annualPay << endl;

return 0;

}

**7. Ocean Levels**

**Assuming the ocean’s level is currently rising at about 1.5 mm per year.**

**Write program that display.**

**the number of millimeter higher than the current level that the ocean’s level will be in 5 year.**

**the number of millimeter higher than the current level that the ocean’s level will be in 7 year.**

**the number of millimeter higher than the current level that the ocean’s level will be in 10 year.**

#include <iostream>

using namespace std;

int main()

{

float risingLvlPerYear = 1.5;

cout << "The number of millimeter higher than the current level that the ocean's level will be in 5 years: " << risingLvlPerYear \* 5 << endl;

cout << "The number of millimeter higher than the current level that the ocean's level will be in 7 years: " << risingLvlPerYear \* 7 << endl;

cout << "The number of millimeter higher than the current level that the ocean's level will be in 10 years: " << risingLvlPerYear \* 10 << endl;

return 0;

}

**8. Total Purchase**

**A customer in a store is purchasing five items. The prices of the five items are Price of item 1 = $15.95**

**Price of item 2 = $24.95**

**Price of item 3 = $6.95**

**Price of item 4 = $12.95**

**Price of item 5 = $3.95**

**Write a program that holds the prices of the five items in five variables. Display each item’s price, the subtotal of the sale, the amount of sales tax, and the total. Assume the sales tax is 7%.**

#include <iostream>

using namespace std;

int main()

{

double item1Price = 15.95;

double item2Price = 24.95;

double item3Price = 6.95;

double item4Price = 12.95;

double item5Price = 3.95;

double subTotal;

subTotal = item1Price + item2Price + item3Price + item4Price + item5Price;

double tax;

tax = subTotal \* 0.07;

double total;

total = subTotal + tax;

cout << "Price of item 1 is: $" << item1Price << ".\n";

cout << "Price of item 2 is: $" << item2Price << ".\n";

cout << "Price of item 3 is: $" << item3Price << ".\n";

cout << "Price of item 4 is: $" << item4Price << ".\n";

cout << "Price of item 5 is: $" << item5Price << ".\n";

cout << "Subtotal price is: $" << subTotal << ".\n\n";

cout << "Tax is: $" << tax << "\n";

cout << "Total is: $" << total << "\n";

return 0;

}

**9. Cyborg Data Type Sizes**

**You have been given a job as a programmer on a Cyborg supercomputer. In order to accomplish some calculations, you need to know how many bytes the following data types use: char , int , float , and double . You do not have any manuals, so you can’t look this information up. Write a C++ program that will determine the amount of memory used by these types and display the information on the screen.**

#include<iostream>

using namespace std;

int main()

{

cout<<"Size of double is "<<sizeof(double)<<endl;

cout<<"Size of int is "<<sizeof(int)<<endl;

cout<<"Size of float is "<<sizeof(float)<<endl;

cout<<"Size of Char is "<<sizeof(char)<<endl;

return 0;

}

**10. Miles per Gallon**

**A car holds 15 gallons of gasoline and can travel 375 miles before refuelling. Write a program that calculates the number of miles per gallon the car gets. Display the result on the screen.**

**Hint: Use the following formula to calculate miles per gallon (MPG):**

#include <iostream>

using namespace std;

int main ()

{

double tankSize = 15;

double maxTravel = 375;

double mpg;

mpg = maxTravel / tankSize;

cout << "Car gets " << mpg << " miles per gallon.\n";

return 0;

}

**11. Distance per Tank of Gas**

**Distance per Tank of Gas A car with a 20-gallon gas tank averages 23.5 miles per gallon when driven in town and 28.9 miles per gallon when driven on the highway. Write a program that calculates and displays the distance the car can travel on one tank of gas when driven in town and when driven on the highway.**

**Hint: The following formula can be used to calculate the distance:**

**Distance = Number of Gallons \* Average Miles Per Gallon**

#include<iostream>

using namespace std;

int main ()

{

float noOfGallon = 20.0;

float avgSpeedOnTown = 23.5;

float avgSpeedOnHighway = 28.9;

cout << "Distance the car can travel on one tank of gas when driven in Town: " << noOfGallon \* avgSpeedOnTown <<" miles"<< endl;

cout << "Distance the car can travel on one tank of gas when driven in Highway: " << noOfGallon \* avgSpeedOnHighway <<" miles"<< endl;

return 0;

}

**12. Land Calculation**

**One acre of land is equivalent to 43,560 square feet. Write a program that calculates the number of acres in a tract of land with 391,876 square feet**

#include<iostream>

using namespace std;

int main ()

{

int acre = 43560;

double land = 391876;

double acres = land / acre;

cout << "Land in square feet: " << land << " square feet" << endl;

cout << "Land in acres: " << acres << " acres" << endl;

return 0;

}

**13. Circuit Board Price**

**An electronics company sells circuit boards at a 35 percent profit. Write a program that will calculate the selling price of a circuit board that costs $14.95. Display the result on the screen.**

#include<iostream>

using namespace std;

int main()

{

double productCost=14.95, productProfit=0.35;

double sellingPrice =productCost\*productProfit+productCost;

cout<<"The selling Price of a circuit Board."<<endl;

cout<<"The initial cost: $"<<productCost<<endl;

cout<<"Selling price is: $"<<sellingPrice<<endl;

}

**14. Personal Information**

**Write a program that displays the following pieces of information, each on a separate line:**

**Your name**

**Your address, with city, state, and ZIP code**

**Your telephone number**

**Your college major**

**Use only a single cout statement to display all of this information.**

#include<iostream>

using namespace std;

int main ()

{

cout<<"Your Name\n"<<"Your address, with city,state,and ZIP code \n"<<"Your Telephone Number\n"<<"Your College major";

return 0;

}

**15. Triangle Pattern**

**Write a program that displays the following pattern on the screen:**

**\***

**\*\*\***

**\*\*\*\*\***

**\*\*\*\*\*\*\***

#include<iostream>

using namespace std;

int main ()

{

int n = 7;

int i, j;

for (int i = 0; i <= n/2; i++)

{

for (int j = -n; j <= n; j++)

{

if (i >= abs(j))

cout << "\*";

else

cout << " ";

}

cout << endl;

}

return 0;

}

**16. Diamond Pattern**

**Write a program that displays the following pattern:**

**\***

**\*\*\***

**\*\*\*\*\***

**\*\*\*\*\*\*\***

**\*\*\*\*\***

**\*\*\***

**\***

#include<iostream>

using namespace std;

int main ()

{

int n = 7;

int i, j;

for (int i = 0; i <= n/2; i++)

{

for (int j = -n; j <= n; j++)

{

if (i >= abs(j))

cout << "\*";

else

cout << " ";

}

cout << endl;

}

for (int i = n/2-1; i >= 0; i--)

{

for (int j = -n; j < n; j++)

{

if (i >= abs(j))

cout << "\*";

else

cout << " ";

}

cout << endl;

}

return 0;

}

**17. Stock Commission**

**Kathryn bought 750 shares of stock at a price of $35.00 per share. She must pay her stockbroker a 2 percent commission for the transaction. Write a program that calculates and displays the following:**

**• The amount paid for the stock alone (without the commission)**

**• The amount of the commission**

**• The total amount paid (for the stock plus the commission)**

#include<iostream>

using namespace std;

int main ()

{

float stock = 750, pricePerShare = 35.00, commission = 2.0 / 100, total;

total = stock \* pricePerShare;

cout << "The amount paid for the stock alone (without the commission): " << stock \* pricePerShare << endl;

cout << "The amount of the commission: " << commission \* total << endl;

total = total + (total \* commission);

cout << "The total amount paid (for the stock plus the commission): " << total << endl;

return 0;

}

**18. Energy Drink**

**Consumption A soft drink company recently surveyed 16,500 of its customers and found that approximately 15 percent of those surveyed purchase one or more energy drinks per week. Of those customers who purchase energy drinks, approximately 58 percent of them prefer citrus-flavoured energy drinks. Write a program that displays the following:**

**• The approximate number of customers in the survey who purchase one or more energy drinks per week**

**• The approximate number of customers in the survey who prefer citrus-flavoured energy drinks**

#include<iostream>

using namespace std;

int main()

{

float totalCustomer = 16500.0;

float purchasedCustomer = 15.0 / 100 \* totalCustomer;

float citrusFlavoured = 58.0 / 100 \* purchasedCustomer;

cout << "The number of customers in the survey who purchase one or more energy drinks per week: " << purchasedCustomer << endl;

cout << "The approximate number of customers in the survey who prefer citrus-flavoured energy drinks: " << (int) citrusFlavoured << endl;

return 0;

}

**END**