

**JIMMA UNIVERSITY**

**INSTITUTE OF TECHNOLOGY**

**FACULTY OF COMPUTING AND INFORMATICS**

**DEPARTMENT OF INFORMATION SCIENCE**

**Programing 1**

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Submitted to: - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exercise one

1. //calculates the product of three integers:

#include <iostream>

using namespace std;

int main() {

int num1, num2, num3, product;

cout << "Enter the first integer: ";

cin >> num1;

cout << "Enter the second integer: ";

cin >> num2;

cout << "Enter the third integer: ";

cin >> num3;

product = num1 \* num2 \* num3;

cout << "The product is: " << product;

return 0;

}

1. //second Question answer

#include<iostream>

using namespace std;

int main() {

int num1, num2, sum, diff, prod, greater, smaller;

float quot;

cout << "Enter two integers: ";

cin >> num1 >> num2;

sum = num1 + num2;

diff = num1 - num2;

prod = num1 \* num2;

if(num1 > num2) {

greater = num1;

smaller = num2;

} else {

greater = num2;

smaller = num1;

}

if(num2 != 0) {

quot = (float) num1 / num2;

cout << "Quotient: " << quot << endl;

} else {

cout << "Cannot divide by zero" << endl;

}

cout << "Sum: " << sum << endl;

cout << "Difference: " << diff << endl;

cout << "Product: " << prod << endl;

cout << "Greater number: " << greater << endl;

cout << "Smaller number: " << smaller;

return 0;

}

1. // calculates and displays the circumference of a circle based on the radius entered by the user:

#include <iostream>

using namespace std;

const float PI = 3.1415;

int main() {

float radius, circumference;

cout << "Enter the radius of the circle: ";

cin >> radius;

circumference = 2 \* PI \* radius;

cout << "The circumference of the circle is: " << circumference;

return 0;

}

1. // solves a quadratic equation based on the coefficients entered by the user using the sqrt function from the math.h header file:

#include <iostream>

#include <math.h>

using namespace std;

int main() {

double a, b, c, root1, root2, discriminant;

cout << "Enter the coefficients of the quadratic equation in the form ax^2 + bx + c: ";

cin >> a >> b >> c;

discriminant = b\*b - 4\*a\*c;

// If the discriminant is positive, the roots are real and distinct

if (discriminant > 0) {

root1 = (-b + sqrt(discriminant)) / (2\*a);

root2 = (-b - sqrt(discriminant)) / (2\*a);

cout << "The roots are real and distinct." << endl;

cout << "Root 1 = " << root1 << endl;

cout << "Root 2 = " << root2 << endl;

}

// If the discriminant is zero, the roots are real and equal

else if (discriminant == 0) {

root1 = -b / (2\*a);

cout << "The roots are real and equal." << endl;

cout << "Root 1 = Root 2 = " << root1 << endl;

}

// If the discriminant is negative, the roots are complex conjugates

else {

double realPart = -b / (2\*a);

double imaginaryPart = sqrt(-discriminant) / (2\*a);

cout << "The roots are complex conjugates." << endl;

cout << "Root 1 = " << realPart << "+" << imaginaryPart << "i" << endl;

cout << "Root 2 = " << realPart << "-" << imaginaryPart << "i" << endl;

}

return 0;

}

//chapter 3 quiz

1. // C++ program that accepts a character from the keyboard and checks whether it is a vowel or not:

#include <iostream>

using namespace std;

int main() {

char c;

bool isVowel = false;

cout << "Enter a character: ";

cin >> c;

// Check if the character is a vowel

switch (c) {

case 'a':

case 'A':

case 'e':

case 'E':

case 'i':

case 'I':

case 'o':

case 'O':

case 'u':

case 'U':

isVowel = true;

}

// Print the result

if (isVowel) {

cout << c << " is a vowel." << endl;

} else {

cout << c << " is not a vowel." << endl;

}

return 0;

}

1. // determines the grade based on the score obtained by a student using if-else statements:

#include <iostream>

using namespace std;

int main() {

int score;

cout << "Enter the score obtained by the student: ";

cin >> score;

if (score >= 95) {

cout << "Grade: A+" << endl;

} else if (score >= 85 && score <= 94) {

cout << "Grade: A" << endl;

} else if (score >= 80 && score <= 84) {

cout << "Grade: A-" << endl;

} } else if (score >= 75 && score <= 79) {

cout << "Grade: B+" << endl;

}else if (score >= 70 && score <= 74) {

cout << "Grade: B" << endl;

} else if (score >=65 && score <= 69) {

cout << "Grade: B-" << endl;

} else if (score >= 60 && score <= 64) {

cout << "Grade: C+" << endl;

} else if (score >= 50 && score <= 59) {

cout << "Grade: C" << endl;

}else {

cout << "Grade: F" << endl;

}

return 0;

}

1. // program that prompts the user to enter three numbers and displays the greatest of them using if statements:

#include<iostream>

using namespace std;

int main() {

float num1, num2, num3;

cout << "Enter three numbers: ";

cin >> num1 >> num2 >> num3;

if (num1 >= num2 && num1 >= num3)

cout << num1 << " is the largest number." << endl;

else if (num2 >= num1 && num2 >= num3)

cout << num2 << " is the largest number." << endl;

else

cout << num3 << " is the largest number." << endl;

return 0;

}

1. // program that accepts three numbers from the user and determines whether they are in increasing, decreasing, or neither order:

#include<iostream>

using namespace std;

int main() {

float num1, num2, num3;

cout << "Enter three numbers: ";

cin >> num1 >> num2 >> num3;

if (num1 < num2 && num2 < num3) {

cout << "Increasing order" << endl;

} else if (num1 > num2 && num2 > num3) {

cout << "Decreasing order" << endl;

} else {

cout << "Neither increasing nor decreasing order" << endl;

}

return 0;

}

1. // program that prompts the user to enter at least three course marks and calculates the sum, average, and grade status (pass or fail):

#include<iostream>

using namespace std;

int main() {

int numCourses;

float marks, sum = 0, average;

cout << "Enter the number of courses: ";

cin >> numCourses;

// Validate that numCourses is at least 3

while (numCourses < 3) {

cout << "Error: Please enter at least three courses." << endl;

cout << "Enter the number of courses: ";

cin >> numCourses;

}

// Use a loop to prompt the user to enter marks for each course

for (int i = 1; i <= numCourses; i++) {

cout << "Enter marks for course " << i << ": ";

cin >> marks;

sum += marks;

}

// Calculate the average

average = sum / numCourses;

// Print the total marks, average, and status

cout << "Total marks obtained: " << sum << endl;

cout << "Average marks: " << average << endl;

if (average >= 60) {

cout << "Grade status: Pass" << endl;

} else {

cout << "Grade status: Fail" << endl;

}

return 0;

}

counter = 0;

while (counter < 5)

{

cout << "\nI love ice cream!";

counter++;

}

prints the statement "I love ice cream!" 5 times.

// chapter three Quiz 2

// calculates the sum of numbers from 1 to 100 using a for loop:

#include<iostream>

using namespace std;

int main()

{

int sum = 0;

for (int i = 1; i <= 100; i++)

{

sum = sum + i;

}

cout << "The sum of numbers from 1 to 100 is " << sum << endl;

return 0;

}

// program that displays numbers between 0-100 that are divisible by 2, 3, and 5:

```cpp

#include<iostream>

using namespace std;

int main()

{

for (int i = 0; i <= 100; i++)

{

if (i % 2 == 0 && i % 3 == 0 && i % 5 == 0)

{

cout << i << endl;

}

}

return 0;

}

// program that calculates the factorial of a number using for loop, while loop, and do-while loop:

#include<iostream>

using namespace std;

int main()

{

int n, fact = 1;

// Accept the number from the user

cout << "Enter a number: ";

cin >> n;

// For loop approach

for(int i = 1; i <= n; i++)

{

fact = fact \* i;

}

cout << "Factorial of " << n << " using for loop is " << fact << "\n";

// Reset fact to 1 for while loop and do-while loop.

fact = 1;

// While loop approach

int i = 1;

while (i <= n)

{

fact = fact \* i;

i++;

}

cout << "Factorial of " << n << " using while loop is " << fact << "\n";

// Reset fact to 1 for do-while loop.

fact = 1;

// Do-While loop approach

int j = 1;

do

{

fact = fact \* j;

j++;

} while (j <= n);

cout << "Factorial of " << n << " using do-while loop is " << fact << "\n";

return 0;

}

// program in C++ that uses a while loop to calculate and print the average of numbers from 1 to 10:

#include <iostream>

using namespace std;

int main()

{

int n = 10;

int i = 1;

int sum = 0;

while (i <= n)

{

sum += i;

i++;

}

float avg = static\_cast<float>(sum) / n;

cout << "The average of numbers from 1 to 10 is " << avg << endl;

return 0;

}