**Programming 1 Assignment 3 (5 marks + 3 bonus )**

**Instructions:**

**1. Submission deadline 12 Nov 2022**

**2. If you copy from others zero will be given.**

1. **Write the output of the following C++ code?**

|  |  |
| --- | --- |
| int pass=0, fail=0;  int grades[10]={ 95, 85, 55, 60, 33, 77, 29, 99, 88, 100};  for (int i=0;i<5;i++)  {  if (grades[i]>=60)  {  cout <<"Student #"<<i<< " pass\n"; pass++;  }  else  {  cout <<"Student #"<<i<< " fail\n"; fail++;  }  }  cout<<"Total Pass =:"<<pass<<endl;  cout<<"Total Fail =:"<< fail <<endl; | **Output:**  Student #0 pass  Student #1 pass  Student #2 fail  Student #3 pass  Student #4 fail  Total Pass =:3  Total Fail =:2 |
| for(int i=1; i<= 3; i++)  for (int j=1; j<=2; j++)  {  if(i == j)  continue;  cout<<"i = "<<i<<" ,j= "<<j;  cout<<" , product = "<<i\*j<<"\n";  } | **Output**:  i = 1,j= 2, product = 2  i = 2,j= 1, product = 2  i = 3 ,j= 1, product = 3  i = 3 ,j= 2 , product = 6 |
| #include <iostream>  using namespace std;  int main()  {  for(int i=2;i<=3;i++)  {  for(int j=1;j<=2;j++)  {  if (i!=j)  {  cout<<”i=”<<i<<”,j=”<<j;  cout<<”,Product= ”<<i\*j<<"\n";  }  }  }  } | **Output:**  1=2,j=1,Product= 2  1=3,j=1,Product= 3  i=3,j=2,Product= 6 |
| #include<iostream>  using namespace std;  void sum(int x ,int y);  int main()  {  int x,y;  x=1,y=4;  sum(x,y);    }  void sum(int x,int y)  {  int s=0;  for (int j=x; j<=y; j++)  {  s+=j;  cout<<”j= “<<j<<”,sum= ”<< s<<endl;  }  return ;  } | **Output:**  j= 1,sum= 1  j= 2,sum= 3  j= 3,sum= 6  j=4,sum= 10 |

1. Write a complete C++ program to summarize the results of 5 students.  Your program

should analyze the results of the exam as follows:

i) Input each test result (a mark from 0 to 100 ). Display the prompting message “Enter

result” each time the program requests another test result.

ii) Check if the mark is within the correct range from 0 to 100 or not. if not correct, ask the

user to re-enter the mark.

iii) Calculate grade of each student mark (A: 90-100, B:89-80, C:79-70, D: 69-60, F:59-0)

iv) Count the number of test results of each type (A,B,C,D,F).

Display a summary of the test results indicating the number of students of each type (A,B,C,D,F)

**Sample run:**

Enter result

98

Enter result

120

Please re-enter the mark, mark should be between 0 and 100

77

Enter result

90

Enter result

55

Enter result

67

The number students who got A are: 2

The number students who got B are: 0

The number students who got C are:1

The number students who got D are:1

The number students who got F are:1

**Answer:**

#include <iostream>

using namespace std;

int main() {

int mark,A=0,B=0,C=0,D=0,F=0;

for(int i=1;i<=5; i++){

cout<<"Enter result"<<endl;

cin>>mark;

if(mark>=100 || mark<=0){

cout<<"Please re-enter the mark, mark should be between 0 and 100"<<endl;

cout<<endl;

cout<<"Enter result"<<endl;

cin>>mark;

}

if (mark>=90)

A++;

else

if (mark>=80)

B++;

else

if (mark>=70)

C++;

else

if (mark>=60)

D++;

else

F++;

}

cout<<"The number students who got A are:"<<A<<endl;

cout<<"The number students who got B are:"<<B<<endl;

cout<<"The number students who got C are:"<<C<<endl;

cout<<"The number students who got D are:"<<D<<endl;

cout<<"The number students who got F are:"<<F<<endl;

return 0;

}

1. **(Bonus question)**

Write a complete C++ program to declare array with size 10 . Prompt the user to enter the chosen number of integers and calculate the product of the **even numbers** in the array and **count** these **even** numbers. Your program should accomplish the following specifications:

1. Declare an integer array size of 10.
2. Declare variables named: prodEven initialize to 1, and countEven initialize to 0.
3. Prompt the user to enter the given size of elements in array.
4. Product of the even integers of array using **do..while loop**. Increment the countEven to count the number of even integers.
5. Display the product and count of even integers.

*For example, if the user enters the array size as 10 and array elements as follows: 1 2 -3 5 4 -1 4 2 3 -3, the program should print product= 64, count= 4.*

**Answer:**

**‏**

#include <iostream>

using namespace std;

void CountingEven(int arr[], int arr\_size)

{

int even\_count = 0;

for (int i = 0; i < arr\_size; i++) {

if (arr[i] %2 == 0)

even\_count++;

}

cout << "Number of even elements = " << even\_count;

}

class Even {

public:

void productEven() {

int index, product\_even = 1;

for (index = 0; index <= 9; index++) {

if (arr[index] % 2 == 0) {

product\_even = product\_even \* index;

}

}

cout << "Product of all even numbers is " << product\_even << "\n";

}};

// Driver Code

int main()

{

int arr[10] ;

for ( int i = 0; i<10; i++ )

{

cout << "Enter value of n[" << i << "]"<< endl;

cin >> arr[i];

}

int n = 10 / sizeof(arr[0]);

CountingEven(arr, n);

Even O;

O.productEven();

}