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**CMS: 023-25-0161**

**CS AI (C)**

**Lab # 2**

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### **Task 1:**

Write and run a program that performs the following steps:

- Create variable pi and radius r of related data type.
- Assign values to above variables.
- Calculating the circumference using the formula:  $C = 2 * \pi * r$ .
- Displaying the circumference C.

### **Solution:**

```
#include <iostream>
using namespace std;
int main(){
    float pi = 3.14;
    float r = 2.3;
    float C = 2*pi*r;
    cout<<"The circumference is: "<<C;
    return 0;
}
```

### **Output:**

```
icrosoft-MIEngine-Pid-0nkfhhn.2if' '--dbgExe=C:\v
The circumference is: 14.444
PS C:\Users\User\Desktop\New folder\LABS\LAB 2>
```

## Task 2:

Write and run a program that performs the following steps:

- Create variable f of related data type.
- Assign values to above variables.
- Calculating the equivalent Celsius temperature C using the formula:  $C = (5/9) (f - 32)$ .
- Displaying the Celsius temperature C.

## Solution:

```
#include <iostream>
using namespace std;
int main(){
    float f;
    cout<<"Enter temp in ferhenhite: ";
    cin>>f; // Taking value from user
    float c = (f - 32) * (5.0/9.0);
    cout<<"The temp in celcius is :" << C;
    return 0;
}
```

## Output:

```
icrosoft-MIEngine-Pid-n1wl321f.n2g' '--dbgExe=C:\msys64
Enter temp in ferhenhite: 98
The temp in celcius is :36.6667
PS C:\Users\User\Desktop\New folder\LABS\LAB 2> |
```

### **Task 3:**

Write a program to take initialVelocity and acceleration from user, save them in respective data types and calculate FINAL VELOCITY as per following formula:

FINAL VELOCITY = initialVelocity + acceleration

### **Solution:**

```
#include <iostream>
using namespace std;
int main(){
    float initialVelocity, acceleration, finalVelocity;
    cout<<"Enter initial velocity: ";
    cin>>initialVelocity;
    cout<<"Enter acceleration: ";
    cin>>acceleration;
    finalVelocity = initialVelocity + acceleration;
    cout<<"The final velocity is: "<< finalVelocity;
    return 0;
}
```

### **Output:**

```
icrosoft-MIEngine-Pid-vqkuzmw1.sf4' '--dbgExe=C:\msys64
Enter initial velocity: 4
Enter acceleration: 3.6
The final velocity is: 7.6
PS C:\Users\User\Desktop\New folder\LABS\LAB 2> |
```

## **Task 4:**

Take distance and time from user, save them in respective data types and calculate SPEED as per following formula:

$$\text{speed} = \text{distance} / \text{time}$$

## **Solution:**

```
#include <iostream>
using namespace std;
int main(){
    float speed, distance, time;
    cout<<"Enter Distance (m): ";
    cin>>distance;
    cout<<"Enter time (s): ";
    cin>>time;
    speed = distance / time;
    cout<<"The speed is: "<< speed;
    return 0;
}
```

## **Output:**

```
icrosoft-MIEngine-Pid-vikinudl.tpz' '--dbgExe=C:\msys64\ucrt64\b
Enter Distance (m): 3
Enter time (s): 5
The speed is: 0.6
PS C:\Users\User\Desktop\New folder\LABS\LAB 2> |
```

## Task 5:

Take mass and velocity from user, save them in respective data types and calculate KINETIC ENERGY as per following formula:

$$\text{KINETIC ENERGY} = 1/2 \cdot \text{mass} \cdot \text{velocity}^2$$

## Solution:

```
#include <iostream>
using namespace std;
int main(){
    float kineticEnergy, mass, velocity;
    cout<<"Enter mass (m): ";
    cin>>mass;
    cout<<"Enter velocity (s): ";
    cin>>velocity;
    kineticEnergy = (1 * mass * (velocity * velocity)) / 2.0;
    cout<<"The Kinetic energy is: "<< kineticEnergy;
    return 0;
}
```

## Output:

```
icrosoft-MIEngine-Pid-ye1juctr.uvq' '--dbgExe=C:\msys64\ucrt64\l
Enter mass : 4
Enter velocity : 3.2
The Kinetic energy is: 20.48
PS C:\Users\User\Desktop\New folder\LABS\LAB 2> |
```

## **Task 6:**

Write a program that will ask UNIT PRICE of chocolate, ice-cream and french-fries. Then your program will ask about (QUANTITY) how many chocolate, ice-cream and french-fries you have to buy. In the end, you have to print the TOTAL BILL by simply multiplying UNIT PRICE of chocolate with QUANTITY of chocolate and so on and so forth.

## **Solution:**

```
#include <iostream>
using namespace std;
int main(){
    int chocolatePrice = 20;
    int icecreamPrice = 150;
    int frenchFries = 100;
    int choc_q , ice_q , fries_q;
    cout<<"The price of chocolate is: " << chocolatePrice<<endl;
    cout<<"The price of ice cream is: " << icecreamPrice<<endl;
    cout<<"The price of french fries is: " << frenchFries<<endl;
    cout<<"Enter quantities of items you want: "<<endl;
    cout<<"Chocolates: ";
    cin>>choc_q;
    cout<<"Icecream: ";
    cin>>ice_q;
    cout<<"French Fries: ";
    cin>>fries_q;
    int total_bill = (chocolatePrice * choc_q ) + (icecreamPrice *
ice_q) + (frenchFries * fries_q);
    cout<<"Your Total Bill is: "<< total_bill;
    return 0;
}
```

## Output:

```
Microsoft-MIEngine-Pid-0wkcqvda.vh2 --dbgExe=C:\msys
The price of chocolate is: 20
The price of ice cream is: 150
The price of french fries is: 100
Enter quantities of items you want:
Chocolates: 4
Icecream: 2
French Fries: 7
Your Total Bill is: 1080
PS C:\Users\User\Desktop\New folder\LABS\LAB 2>
```

## Task 7:

Make a program where it is asked form user to enter total amount, you have to answer how much ZAKAT to be paid on that amount. ZAKAT is the 2.5% of the total amount.

## Solution:

```
#include<iostream>
using namespace std;
int main(){
    int totalAmount;
    cout<<"Enter your total amount: ";
    cin>>totalAmount;
    float zakat = (2.5/100) * totalAmount;
    cout<<"The Zakat you need to pay is: "<< zakat;
    return 0;
}
```

## Output:

```
Enter your total amount: 100000
The Zakat you need to pay is: 2500
PS C:\Users\User\Desktop\New folder\LABS\LAB 2>
```

## **Task 8:**

Write and run a program that reads an angle (expressed in degrees) and states in which quadrant the given angle lies. An angle A is said to be in the

- First quadrant if it is in the range  $0 \leq A < 90$
- second quadrant if it is in the range  $90 \leq A < 180$
- third quadrant if it is in the range  $180 \leq A < 270$
- and fourth quadrant if it is in the range  $270 \leq A < 360$

## **Solution:**

```
#include <iostream>
using namespace std;
int main(){
    int angle;

    cout<<"Enter angle in degrees: ";
    cin>>angle;
    if (angle >= 0 && angle < 90){
        cout<<"First Quadrant";
    }
    else if(angle >=90 && angle <180){
        cout<<"Second Quadrant";
    }
    else if(angle >=180 && angle <270){
        cout<<"Third Quadrant";
    }
```



```
else if(angle >=270 && angle <360){  
    cout<<"Fourth Quadrant";  
}  
else {  
    cout<<"You have entered wrong value (>360)";  
}  
return 0;  
}
```

## Output:

```
Microsoft-MinEngine-Pid-me4ptscr.js --dbgExe=C:\msys64  
Enter angle is degrees: 132  
Second Quadrant  
PS C:\Users\User\Desktop\New folder\LABS\LAB 2> |
```