NAME:FAHAD ALI

SAP ID:70174668

SECTION 1-O

SUBMITTED TO:SIR SALMAN IRFAN

Lab 8 ungraded assignment assignmet

Question 1: Write a program to store two numbers in memory and sum them
Algorithm:

ALGORITHM STEPS:

Step 1: Start

Step 2: number1= 10, number2 = 20

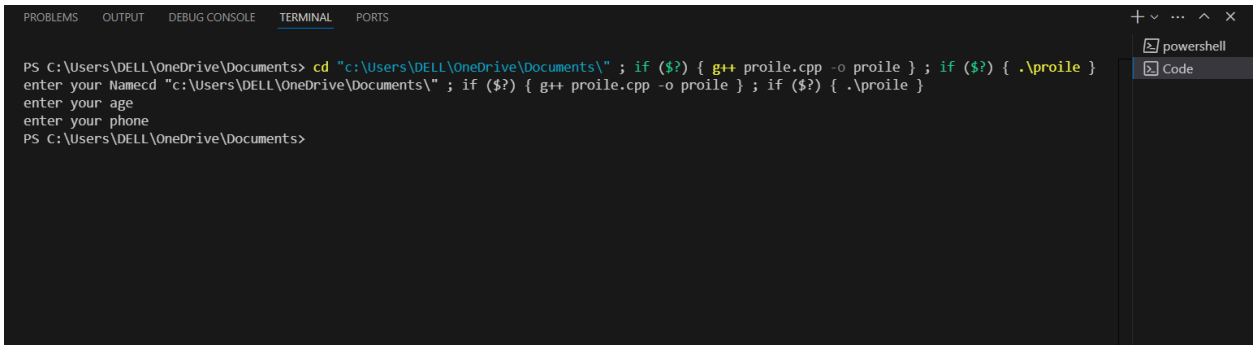
Step 3: answer = number1 + number2 Step 4: print answer

Step 5: Stop

CODE:

```
#include <iostream>
using namespace std;
int main(){
    int number1=10;
    int number2=20;
    cout<<"number1+number2";//30
    cout<<"=30";
    return 0;
}
```

OUTPUT:



MEMORY REPRESENTATION DIAGRAM:

	1	2	3	4
A	Number 1=10	Number 2=20	Sum=30	
B				
C				
D				

Question 2: Write a program to take two numbers from user and sum them

ALGORITHM STEPS:

Step 1: Start

Step 2: print “Enter first number” Step 3: input number1

Step 4: print “Enter 2ndnumber” Step 5: input number2

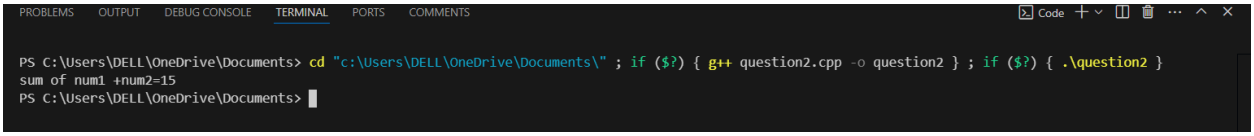
Step 6: sum = number1 + number2 Step 7: print sum

Step 8: Stop

CODE:

```cpp
#include <iostream>
using namespace std;
int main(){
    int number =5;
    int num2 =10;
    cout<<"sum of num1 +num2=15";
    return 0;
}
```

OUTPUT:



MEMORY REPRESENTATION DIAGRAM:

	1	2	3	4
A	Number 1=5	Number 2=10	Sum=15	
B				
C				
D				

Question 3: Write a program that convert USD to PKR

ALGORITHM STEPS:

Step 1: Start

Step 2: print “Enter value in usd”

Step 3: input usd

Step 4: pkr = usd * 170

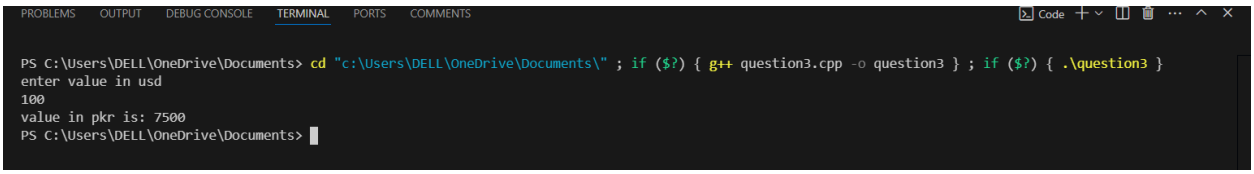
Step 5: print pkr

Step 6: Stop

CODE:

```cpp
#include <iostream>
using namespace std;
int main() {
    float usd,pkr;
    cout << "enter value in usd" << endl;
    cin>>usd;
    pkr = usd * 75;
    cout << "value in pkr is: " << pkr << endl;
    return 0;
}
```

OUTPUT:



MEMORY REPRESENTATION DIAGRAM:

	1	2	3	4
A	USD=100	PKR=USD*75	PKR=7500	
B				
C				
D				

Problem 4:

Let's say we have a computer with limited memory (three cells, MA1, MA2 and MA3). **Write** an **C++ code** that calculates the value of the following expression after taking input from the user and show the output on the console:

(a * (b + c)) + (c * (a + c))

Algorithm

Reserve MA1, MA2, MA2 for the integer value

Represent Step by Step Memory Representation.

ALGORITHM STEPS:

START

STEP 1:THREE MEMORY CELLS(MA1+MA2+MA3)

STEP 2:INPUT THEIR VALUES

STEP 3:FIRST ADD(B+C)

STEP 4:MULTIPLY A WITH (B+C)

STEP 5:ADD(A+C)

STEP 6:MULTIPY C WITH (A+C)

STEP 7:Add step step 4 and step 6

Step 8:print result

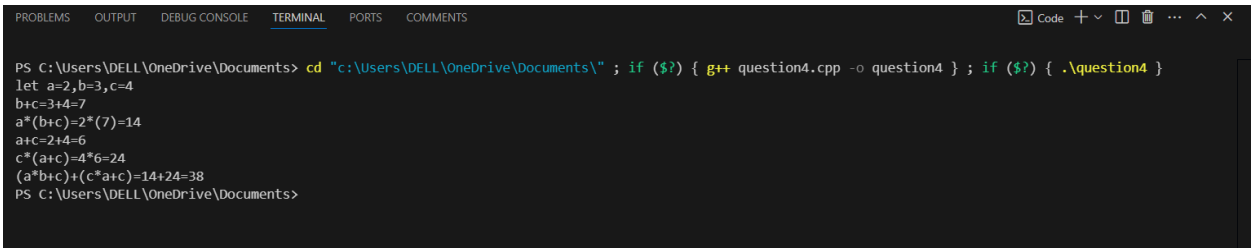
END

CODE:

```cpp
#include <iostream>
using namespace std;
int main(){
    int a=2;
    int b=3;
    int c=4;
    cout<<"let a=2,b=3,c=4"<<endl;
    cout<<"b+c=3+4=7"<<endl;
    cout<<"a*(b+c)=2*(7)=14"<<endl;
```

```
    cout<<"a+c=2+4=6"<<endl;
    cout<<"c*(a+c)=4*6=24"<<endl;
    cout<<"(a*b+c)+(c*a+c)=14+24=38"<<endl;
    return 0;
}
```

OUTPUT:



MEMORY REPRESENTATION DIAGRAM:

	1	2	3	4
A	B+C=3+4=7	A+C=6	TOTAL SUM=38	
B	A*(B+C)=14	C*(A+C)=24		
C				
D				

Problem 5:

Write a C++ program that takes the length of a rectangular fence in feet from the user and the width of the fence in feet and then outputs its area on the screen.

Formula to calculate the Area is

Area ($feet^2$) = Length (feet) * Width (feet)

ALGORITHM STEPS:

START

Step 1:length of rectangular fence in feet

Step 2:width of rectangular fence in feet

Step 3:multiply length and width

Step 4:print result in feet(square)

END

Problem 6:

A toy car accelerates from initial velocity to final velocity in some time. You have to write the C++ program for calculating the Final Velocity. Take initial velocity, acceleration and time as input from the user and calculate the final velocity of the car and display on the screen.

Formula to Calculate the Acceleration is

Acceleration = (Final velocity - Initial velocity) / Time

Remember: You have to calculate final velocity.

ALGORITHM STEPS:

START

Step 1:INPUT 1=initial velocity

Step 2:INPUT 2=final velocity

Step 3:INPUT 3=time taken

Step 4:acceleration=input 2-input 1

Step 5:divide step 4 by step 3

Step 6:print result

END

Problem 7:

A teacher wants to calculate the students marks percentage; teachers have 5 subject marks for every student. He needs a program that automates this process by asking 5 subjects' marks from the user and calculating the percentage of students. Total marks are 500 for 5 subjects. To guide the user, first you need to display a message and then take input from the user. Do it for all 5 subjects.

Your Name:

Enter subject 1 marks: Enter subject 2 marks: Enter subject 3 marks: Enter subject 4 marks: Enter subject 5 marks:

Once all five subjects have entered, show the student's name and total obtained percentage on the console.

ALGORITHM STEPS

START

Step 1:input student name

Step 2:input subject 1marks

Step 3:input subject 2 marks

Step 4:input subject 3 marks

Step 5:input subject 4 marks

Step 6:input subject 5 marks

Step 7:add step (1-5)

Step 8:divide step 7 by total subject marks*100=%

Step 9:result=step 1and step 8

END

Problem 8:

During each summer, Ali and Ahmad grow vegetables in their backyard and buy seeds and fertilizer from a local nursery. The nursery carries different types of vegetable fertilizers in various bag sizes. When buying a particular fertilizer, they want to know the price of the fertilizer per pound and the cost of fertilizing per square foot. Write the Algorithm that prompts the user to enter

1. The size of the fertilizer bag in pounds.

2. The cost of the bag.

3. And the area in square feet that can be covered by the bag.

The Algorithm should then output

1. The cost of the fertilizer per pound
2. The cost of fertilizing the area per square foot.

ALGORITHM STEPS

START

3. Step 1:input:size of fertilizer bag
4. Step 2:input:cost of bag
5. Step 3:area in square feet covered by bag
6. Step 4:result=output:cost of the fertilizer per pound
7. Step 5:output:cost of fertilizing the area per square
8. END

Problem 9:

Write a program that takes 15 numbers from the user, it adds the first 5 numbers, multiplies the next 5 numbers, and subtract the next 5 numbers. After that it adds the first two results and subtract the 3rd results and shows the final output on the monitor screen.

ALGORITHM STEPS

START

Step 1:input number (1-15)

Step 2:add number(1-5)

Step 3:multiply number(6-10)

Step 4:subtract number(11-15)

Step 5:add step 2 and 3

Step 6:subtract step 4 from step 5

Step 7:print result

END

Problem 10:

There is a modulus operator that returns the remainder like if we take modulus of 4 with 3 it would return 1. If we take 7 % 4 it would return 3.

With the help of a modulus operator, write a program that takes a 4 digit number from the user and sum individual digits.

Test Case

If user enter 1234

The output would be 10

If user enter 4324

The output would be 13

If user enter 4901 The

output would be 14

Problem 11:

Take a number from the user and print its reverse number

Hint: Use modulus operator and divide operator

Test Case

If user enter 1234

The output would be 4321

If user enter 4324

The output would be 4234

If user enter 4901

The output would be 1094

ALGORITHM STEPS:

START

Step 1:input number

Step 2:print reverse of step 1

END