WEEK-1

Rajalakshmi Engineering College

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 1_COD

Attempt : 1
Total Mark: 5
Marks Obtained : 5

Section 1 : Coding

1. Problem Statement

Quentin, a mathematics enthusiast, is exploring the properties of numbers. He believes that for any set of four consecutive integers, calculating the average of their fourth powers and then subtracting the product of the first and last numbers yields a constant value.

To validate his hypothesis, check if the result is indeed constant and display.

Exampl
e:

Input:

5

Output:

Constant value: 2064.5

Explanation:

Find the Average:

Average: (625 + 1296 + 2401 + 4096)/4 = 2104.5

Now, we calculate the product of a and (a + 3):

Product = 5× (5+3) = 5× 8 = 40

Final result: 2104.5 - 40 = 2064.5

Input Format

The input consists of an integer a, representing the first of four consecutive integers.

Output Format

The output displays "Constant value: " followed by the computed result based on Quentin's formula.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5

Output: Constant value: 2064.5

Answer

```
a=int(input())
sum=0
for n in range(0,4):
    sum += (a+n)**4
average=sum/4
product=a*(a+3)
print("Constant   value:",average-product)
```

2. Problem Statement

A science experiment produces a decimal value as the result. However, the scientist needs to convert this value into an integer so that it can be used in further calculations.

Write a Python program that takes a floating-point number as input and converts it into an integer.

Input Format

The input consists of a floating point number, F.

Output Format

The output prints "The integer value of F is: {result}", followed by the integer number equivalent to the floating point number.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 10.36

Output: The integer value of 10.36 is: 10

Answer

```
#You are using
Python f =
float(input())
int_value=int(f)
print("The integer value of ",f,"is:",int_value)
```

Status : Correct

Marks : 1/1

3. Problem Statement

A company has hired two employees, Alice and Bob. The company

Write a program to swap their salaries and print the new salary of each employee.

Input Format

The first line of input consists of an integer N, representing Alice's salary.

The second line consists of a float value F, representing Bob's salary.

Output Format

The first line of output displays "Initial salaries:"

The second line displays "Alice's salary = N", where N is Alice's salary.

The third line of output displays "Bob's salary = F", where F is Bob's salary.

After a new line space, the following line displays "New salaries after swapping:" The next line displays "Alice's salary = X", where X is the swapped salary.

The last line displays "Bob's salary = Y", where Y is the swapped salary.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10000
15400.55
Output: Initial salaries:
Alice's salary = 10000
Bob's salary = 15400.55

New salaries after swapping:
Alice's salary = 15400.55
Bob's salary = 10000

```
b = float(input())
print("Initial salaries:")
print("Alice's salary = ",a)
print("Bob's salary = ",b)
a,b=b,a
print("\n")
print("New salaries after swapping:")
print("Alice's salary = ",a)
print("Bob's salary = ",b)
```

Status : Correct *Marks : 1/1*

4. Problem Statement

In a family, two children receive allowances based on the gardening tasks they complete. The older child receives an allowance rate of Rs. 5 for each task, with a base allowance of Rs. 50. The younger child receives an allowance rate of Rs. 3 for each task, with a base allowance of Rs. 30.

Your task is to calculate and display the allowances for the older and younger children based on the number of gardening tasks they complete, along with the total allowance for both children combined.

Input Format

The first line of input consists of an integer n, representing the number of chores completed by the older child.

The second line consists of an integer m, representing the number of chores completed by the youngest child.

Output Format

The first line of output displays "Older child allowance: Rs." followed by an integer representing the allowance calculated for the older sibling.

The second line displays "Younger child allowance: Rs." followed by an integer representing the allowance calculated for the youngest sibling.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10
5

Output: Older child allowance: Rs.100
Younger child allowance: Rs.45
Total allowance: Rs.145

Answer

```
#You are using Python
num =int(input())
m =int(input())
older = 50+num*5;
younger = 30+m*3;
print(f"Older child allowance: Rs.{older}")
print(f"Younger child allowance: Rs.{younger}")
print(f"Total allowance: Rs.{older + younger}")
```

Status : Correct

5. Problem Statement

Marks : 1/1

Bob, the owner of a popular bakery, wants to create a special offer code for his customers. To generate the code, he plans to combine the day of the month with the number of items left in stock.

lelp Bob to encode these two values into a unique offer code.

ote: Use the bitwise operator to calculate the offer code.

ampl

put:

Output:

Offer code: 6

Explanation:

Given the day of the month 15th day (binary 1111) and there are 9 items left (binary 1001), the offer code is calculated as 0110 which is 6.

Input Format

The first line of input consists of an integer D, representing the day of the month.

The second line consists of an integer S, representing the number of items left in stock.

Output Format

The output displays "Offer code: " followed by an integer representing the encoded offer code.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 15
9

Output: Offer code: 6

Answer

```
num = int(input())
num1 = int(input())
print("Offer code: ",num^num1)
```

Status : Correct

Marks : 1/1

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 1_COD_Question 5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Imagine you are tasked with developing a simple GPA management system using a singly linked list. The system allows users to input student GPA values, insertion should happen at the front of the linked list, delete record by position, and display the updated list of student GPAs.

Input Format

The first line of input contains an integer n, representing the number of students.

The next n lines contain a single floating-point value representing the GPA of each student.

The last line contains an integer position, indicating the position at which a student record should be deleted. Position starts from 1.

```
    for (int i = 0; i < n; i++) {
        int activity;
        scanf("%d", &activity);
        insertAtFront(&head, activity);
    }

    printList(head);
    struct Node* current = head;
    while (current != NULL) {
        struct Node* temp = current;
        current = current->next;
        free(temp);
    }

    return 0;
}
```

Status : Correct

Marks : 10/10

```
    while(fast!=NULL && fast->next!=NULL)
    {
        slow=slow->next;
        fast=fast->next->next;
    }
    return slow->data;
}
void displayList(struct Node* head)
{
    struct Node*temp=head;
    while(temp!=NULL)
    {
        printf("%d",temp->data);
        temp=temp->next;
    }
    printf("\n");
}

int main() {
    struct Node* head = NULL;
    int n;

    scanf("%d", &n);
    int value;

    for (int i = 0; i < n; i++) {
        scanf("%d", &value);
        head = push(head, value);
    }

    struct Node* current = head;
    while (current != NULL) {
        printf("%d ", current->data);
        current = current->next;
    }
    printf("\n");


    int middle_element = printMiddle(head);
    printf("Middle Element: %d\n", middle_element);
```

The second line consists of n space-separated integers, representing the elements of the list.

Output Format

The first line of output displays the linked list after inserting elements at the front.

The second line displays "Middle Element: " followed by the middle element of the linked list.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
10 20 30 40 50
Output: 50 40 30 20 10
Middle Element: 30

Answer

```
#include <stdio.h>
#include <stdlib.h>
struct Node {
   int data;
   struct Node* next;
};

// You are using GCC
struct Node* push(struct Node* head,int data)
{
   struct Node* newNode=(struct Node*)malloc(sizeof(struct Node));
   newNode->data=data;
   newNode->next=head;
   return newNode;
}
int printMiddle(struct Node* head)
{
   struct Node *slow=head,*fast=head;
```

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 1_COD_Question 7

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Dev is tasked with creating a program that efficiently finds the middle element of a linked list. The program should take user input to populate the linked list by inserting each element into the front of the list and then determining the middle element.

Assist Dev, as he needs to ensure that the middle element is accurately identified from the constructed singly linked list:

If it's an odd-length linked list, return the middle element.If it's an even-length linked list, return the second middle element of the two elements.

Input Format

The first line of input consists of an integer n, representing the number of elements in the linked list.

```
}
int main(){
    int n;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        int roll;
        scanf("%d",&roll);
        insert(roll);
    }
    display();
    return 0;
}
```

Marks : 10/10

Status : Correct

The output prints the space-separated integers singly linked list, after inserting the roll numbers of students at the end.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
23 85 47 62 31

Output: 23 85 47 62 31

Answer

```
// You are using GCC
#include <stdio.h>
#include <stdlib.h>
struct node{
   int data;
   struct node*next;
}*head=NULL;
void insert(int data){
   struct node* newnode=(struct node*)malloc(sizeof(node));
   newnode->data=data;
   newnode->next=NULL;
   if(head==NULL){
      head=newnode;
   }
   else{
      struct node *temp=head;
      while(temp->next!=NULL){
         temp=temp->next;
      }
      temp->next=newnode;
   }
}
void display(){
   struct node *temp=head;
   while(temp!=NULL){
      printf("%d ",temp->data);
      temp=temp->next;
   }
```

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 1_COD_Question 6

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

John is tasked with creating a program to manage student roll numbers using a singly linked list.

Write a program for John that accepts students' roll numbers, inserts them at the end of the linked list, and displays the numbers.

Input Format

The first line of input consists of an integer N, representing the number of students.

The second line consists of N space-separated integers, representing the roll numbers of students.

Output Format