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23-24 Subject Title: Operating Systems Lab

EXPERIMENT No : 4 Assignment No: 5

TITLE : **Arithmetic Operations** DoP :

Aim: Implement and demonstrate arithmetic operations

Learning Outcomes: 1. To understand the arithmetic operation

2. To Demonstrate the arithmetic operations using Linux command.

Hardware/Software: (to be handwritten)

Problem Definition:

A program should be written where all the following conditions should be satisfied.

1. Perform basic operations like Addition, Subtraction, Multiplication, and Division. Accept input from a user.

2. Calculate the area and perimeter of the circle. Accept radius from a user. (Assume $\pi=3.14$)

3. Calculate employees' gross salary, where DA is 1.65% of the basic salary, and HRA is 0.30% of the basic salary. Accept the value of basic salary from a user.

4. Calculate the mean salary given by a company if the basic salary of employees A, B, C, and D are Rs.1200, 1400, 1350, and 1800 respectively.

Theory: handwritten

Algorithm :

1. Arithmetic operations:

Step 1: Start

Step 2: Input two numbers

Step 3: Perform arithmetic operations(+, -, *, /)

Step 4: Display output of arithmetic operations

Step 5: Stop

2. Area and perimeter of circle:

Step 1: Start

Step 2: Input radius of circle and define pi as

constant($\pi=3.142$) Step 3: Calculate area and perimeter of circle

$$\text{area} = (\pi * r * r)$$

$$\text{perimeter} = (2 * \pi * r)$$

Step 4: Display area and perimeter of circle

Step 5: Stop

3. Gross salary of employee:

Step 1: Start

Step 2: Input the value of the basic salary from the user

Step 3: Calculate DA = 1.65% of the basic salary

Step 4: Calculate HRA = 0.30% of the basic salary

Step 5: Calculate gross salary = Basic salary + DA + HRA

Step 6: Display the gross salary

Step 7: Stop

4. Mean salary of employee:

Step 1: Start

Step 2: Input the basic salaries of employees A, B, C, and D.

- Salary of A = Rs. 1200
- Salary of B = Rs. 1400
- Salary of C = Rs. 1350
- Salary of D = Rs. 1800

Step 3: Calculate the total salary by adding the salaries of all employees:

Total salary = Salary of A + Salary of B + Salary of C + Salary of D Step

4: Calculate the mean salary using the formula:

$$\text{Mean salary} = (\text{Total salary}) / (\text{Number of employees})$$

Step 5: Display the mean salary.

Step 6: Stop

Program: Softcopy format

Steps to execute the program: handwritten

Output:

1. Perform basic operations like Addition, Subtraction, Multiplication, and Division. Accept input from a user:

```
6 echo ""
7
8 echo -n "Enter a number = "
9 read a
10
11 echo -n "Enter another number = "
12 read b
13
14 c=`expr $a / $b `
15 echo "Quotient is $c"
```

```
Enter a number
12
Enter another number
5
answer is 27
root@ubuntu:/home/student#
```

```
Enter a number = 12
Enter another number = 04
Difference is 8
root@ubuntu:/home/student#
```

```
Enter a number = 12
Enter another number = 04
Product is 48
root@ubuntu:/home/student#
```

```
Enter a number = 12
Enter another number = 04
Quotient is 3
root@ubuntu:/home/student#
```

2. Calculate the area and perimeter of the circle. Accept radius from a user. (Assume $\pi=3.14$):

```

5
6 echo ""
7
8 pi=3.142
9
10 echo -n "Enter radius of circle = "
11 read rad
12 perimeter=$(echo "scale=3; 2 * $pi * $rad" | bc -l )
13 area=$(echo "scale=3; $pi * $rad * $rad " | bc -l)
14 echo "Perimeter of circle is $perimeter units"
15 echo "Area of circle is $area units"

```

```

Enter radius of circle = 7
Perimeter of circle is 43.988 units
Area of circle is 153.958 units
root@ubuntu:/home/student#

```

3. Calculate employees' gross salary, where DA is 1.65% of the basic salary, and HRA is 0.30% of the basic salary. Accept the value of basic salary from a user.

```

5
6 echo "Enter the basic salary:"
7 read basic_salary
8 DA=$(echo "scale=2; $basic_salary * 0.0165" | bc)
9 HRA=$(echo "scale=2; $basic_salary * 0.0030" | bc)
10 gross_salary=$(echo "scale=2; $basic_salary + $DA + $HRA" | bc)
11 echo "The gross salary is: $gross_salary"
12

```

```

Enter the basic salary:
100000
The gross salary is: 101950.0000
root@ubuntu:/home/student#

```

4. Calculate the mean salary given by a company if the basic salary of employees A, B, C, and D are Rs.1200, 1400, 1350, and 1800 respectively.

```
4
5 salary_A=1200
6 salary_B=1400
7 salary_C=1350
8 salary_D=1800
9 total_salary=$(echo "$salary_A + $salary_B + $salary_C + $salary_D" | bc)
10 echo ""
11 mean_salary=$(echo "scale=2; $total_salary / 4" | bc)
12 echo "The mean salary is: Rs. $mean_salary"
13
```

```
The mean salary is: Rs. 1437.50
root@ubuntu:/home/student#
```

Conclusion: In conclusion, this program successfully implements basic arithmetic operations, including addition, subtraction, multiplication, and division. It further extends functionality by calculating the area and perimeter of a circle, the gross salary of employees considering allowances, and the mean salary of a company. By leveraging user input and performing calculations based on given formulas, the program demonstrates key arithmetic operations effectively using Linux commands.