

## LAB 05 – IT23184558 [Binuwara D B Y]

### Exercise 01

```
ers > yesen binuwara > Documents > C Lab 05_01.c > main()
#include <stdio.h>
int main() {

    int idNumber, wageRate, noOfHours;
    float wage, netWage, average, averageWage;
    float totalPayroll = 0;
    float taxRate = 3.625;
    int counter = 1;

    for (int i=1; i >= 0; i++) {
        printf("EMPLOYEE NO. %d\n", i);
        printf("Enter the Identification Number: ");
        scanf("%d", &idNumber);
        printf("Enter the hourly wage rate: ");
        scanf("%d", &wageRate);
        printf("Enter number of hours worked: ");
        scanf("%d", &noOfHours);

        if (noOfHours <= 40)
            wage = noOfHours * wageRate;
        else
            wage = (noOfHours * wageRate) + ((noOfHours - 40) * (wageRate / 2));
        netWage = wage - (wage * (taxRate / 100));

        printf("\nIdentification Number: %d\n", idNumber);
        printf("Employee Net Wage: %.2f\n", netWage);

        totalPayroll = totalPayroll + wage;
        printf("Total Payroll: %.2f\n", totalPayroll);

        average = totalPayroll / counter;
        printf("Average Payroll: %.2f\n", average);
        counter +=1;
    }
    return 0;
}
```

## Exercise 02

C: > Users > yesen binuwara > Documents > C Lab 05\_02.c > main()

```
1  #include <stdio.h>
2  int main() {
3
4  int num;
5  long factorial = 1;
6
7  printf("Enter a positive integer: ");
8  scanf("%d", &num);
9
10 for (int i=2; i<=num; i++){
11     factorial = factorial * i;
12 }
13
14 printf("Factorial: %ld\n", factorial);
15 return 0;
16
17 }
18
```

## Exercise 03

```
C: > Users > yesen binuwara > Documents > C Lab 05_03.c > main()
1  #include <stdio.h>
2  #include <math.h>
3  int main() {
4      float a = 3.592;
5      float b = 0.0427;
6      float R = 0.08206;
7      double volume, moles, temp, initialVolume, finalVolume, volumeIncrement;
8
9      printf("Enter number of moles: ");
10     scanf("%lf", &moles);
11     printf("Enter absolute temperature: ");
12     scanf("%lf", &temp);
13     printf("Enter initial volume in ml: ");
14     scanf("%lf", &initialVolume);
15     printf("Enter final volume in ml: ");
16     scanf("%lf", &finalVolume);
17     printf("Enter volume increment in ml: ");
18     scanf("%lf", &volumeIncrement);
19
20     //table title print
21     printf("Volume(L)\t Pressure(atm)\n");
22
23     //converting ml to L
24     initialVolume /= 1000;
25     finalVolume /= 1000;
26     volumeIncrement /= 1000;
27
28     //calculation
29     for (double volume = initialVolume; volume <= finalVolume; volume += volumeIncrement) {
30         double pressure = (moles * R * temp / (volume - moles * b)) - (moles * moles * a / (volume * volume));
31         printf("%.3lf\t %.3lf\n", volume, pressure);
32     }
33
34     return 0;
35 }
```

## Exercise 04

```
C: > Users > yesen binuwara > Documents > C Lab 05_04.c > main()
1  #include <stdio.h>
2  #include <math.h>
3  int main(){
4
5  double initialAmount, amountRemaining, halfLife;
6
7  printf ("Enter the initial amount of Co60 in grams: ");
8  scanf("%lf", &initialAmount);
9
10 halfLife = 5.272;
11 printf("\nYear\t Amount Remaining\n");
12
13 for (int i = 0; i <= 5; i++){
14     amountRemaining = initialAmount * exp(-0.693 * i / halfLife);
15     printf("%d\t %f grams\n", i, amountRemaining);
16 }
17 return 0;
18 }
19
```

## Exercise 05

```
C: > Users > yesen binuwara > Documents > C Lab 05_05.c > main()
1  #include <stdio.h>
2  #include <math.h>
3  int main() {
4
5      double width = 15.0;
6      double slope = 0.0015;
7      double roughness = 0.014;
8      double cubicFeetPerSecond = 1000;;
9      double depthGuess, flow, error;
10
11     printf("Enter depth guess in feet: ");
12     scanf("%lf", &depthGuess);
13
14     while (1) {
15         double area = depthGuess * width;
16         double perimeter = width + (2 * depthGuess);
17         double hydraulicRadius = area / perimeter;
18         flow = 1.0 / roughness * area * pow(hydraulicRadius, 2 / 3) * sqrt(slope);
19         printf("Depth: %lf feet\nFlow: %lf cubic feet per second\n", depthGuess, flow);
20
21         error = (flow - cubicFeetPerSecond) / cubicFeetPerSecond / 100;
22         if (error <= 0.1)
23             printf("The calculated value is within the range of 0.1\n");
24             break;
25         if (flow < cubicFeetPerSecond)
26             printf("Enter a higher depth");
27         else
28             printf("Enter a lower depth");
29             scanf("%lf", &depthGuess);
30     }
31     return 0;
32 }
```