

**NATIONAL UNIVERSITY OF SCIENES & TECHNOLOGY**

**Fundamentals of Programming (CS114)**

**Assignment # 4**

**Submitted to:** Miss Ain Zia

**Submitted by:** Muhammad Umer

**CMS ID:** 345843

**Class:** BEE-12-C

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**CS114 Fundamentals of Programming**

**Assignment 4**

**Deadline: 19th January 2021, 11:59 PM**

**Submission: Email your assignment as a single word/ pdf file to Miss Ain Zia at** [azia.msee18seecs@seecs.edu.pk](mailto:azia.msee18seecs@seecs.edu.pk). **You must include your name, registration number and section at the top of your assignment. Add comments in your program. (To get full marks your code should be legible, not only just correct)**

**Question 1:**

A person invests $1000.00 in a savings account yielding 5% interest. Assuming that all interest is left on deposit in the account, using while loop calculate and print the amount of money in the account at the end of each year for 10 years. Use the following formula for determining these amounts:

Where

p is the original amount invested (i.e., the principal)

r is the annual interest rate

n is the number of years

a is the amount on deposit at the end of the nth year

**Code**:

#include <stdio.h>

int main() {

int n = 10, i = 1; // declaration of variables

float a, p = 1000.00, r, interest = 1;

r = 0.05;

**while**(i<=n) { // recursion till 10 years

interest \*= (1 + r);

a = p\*(interest); // interest formula

printf("Amount of deposit at the end of year %d is %f.\n", i, a);

i++;

}

**return** 0;

}

**Question 2:**

Write a program that sums a sequence of integers. Assume that the first integer read with scanf specifies the number of values remaining to be entered. Your program should read only one value each time scanf is executed. A typical input sequence might be

5 100 200 300 400 500

where the 5 indicates that the subsequent five values are to be summed.

**Code**:

#include <stdio.h>

#define N 1000

int main()

{

int sum = 0, i, temp = 1, b; // declaration

int numbers[N] = {0};

**for**(i=0; i < temp + 1; i++)

{

scanf("%d", &numbers[i]);

sum = sum + numbers[i];

temp = numbers[0]; // so loop runs the times we need

}

printf("The sum of %d entered numbers is %d", numbers[0], sum - numbers[0]);

// we delete the initial value from sum

**return** 0;

}

**Question 3:**

Write a program that calculates and prints the average of several integers. Assume the last value read with scanf is the sentinel 9999. A typical input sequence might be

10 8 11 7 9 9999

indicating that the average of all the values preceding 9999 is to be calculated.

**Code**:

#include <stdio.h>

int main()

{

int i, upper = 0, total = 0; // declaration

float average;

printf("Enter numbers to take average of: \n");

**while** (1) // an infinite loop that only breaks

{

scanf("%d", &i);

**if** (i == 9999) /\* breaks the infinite loop if

{ the input value is 9999 \*/

**break**;

}

upper++;

total = total + i;

}

average = (float) total / (float) upper; // formula

printf("%.2f", average);

**return** 0;

}

**Question 4:**

Write a program that calculates and prints the sum of the even integers from 2 to 30.

**Code**:

#include<stdio.h>

int main()

{

int a, sum = 0; // declaration

**for** (a = 2; a <= 30; a= a + 2) // a loop with an even increment

{

sum = sum + i; // to add values the former loop

}

printf("Sum of Even Integers is %d\n", sum);

**return** 0;

}

**Question 5:**

A company pays its employees as managers (who receive a fixed weekly salary), hourly workers (who receive a fixed hourly wage for up to the first 40 hours they work and “time-and-a-half”—i.e., 1.5 times their hourly wage—for overtime hours worked), commission workers (who receive $250 plus 5.7% of their gross weekly sales), or pieceworkers (who receive a fixed amount of money for each of the items they produce—each pieceworker in this company works on only one type of item). Write a program to compute the weekly pay for each employee. You do not know the number of employees in advance. Each type of employee has its own pay code: Managers have pay code 1, hourly workers have code 2, commission workers have code 3 and pieceworkers have code 4. Use a switch to compute each employee’s pay based on that employee’s pay code. Within the switch, prompt the user (i.e., the payroll clerk) to enter the appropriate facts your program needs to calculate each employee’s pay based on that employee’s pay code. [Note: You can input values of type double using the conversion specifier %lf with scanf.]

**Code**:

#include<stdio.h>

#include<stdlib.h>

int main(void)

{

int paycode, work\_hours; // declaration of variables

double manager\_pay, hourly\_pay;

double extra\_pay = 0, total;

double weekly\_sales, comission\_pay;

double p\_item, n\_item, pieceworker\_pay;

printf("Employee Payroll Calculator\n");

**while** (1) // an infinite of loop to keep the propmt going

{

printf("\nSpecify the Paycode: ");

scanf("%d", &paycode);

switch (paycode) // to select categories of paycode

{

case 1:

printf("\nManager's Paycode is Selected!\n");

printf("\nEnter the fixed pay: ");

scanf("%lf", &manager\_pay);

manager\_pay = abs(manager\_pay);

printf("\nWeekly Salary of Manager is %.2lf$.\n", manager\_pay);

**break**;

case 2:

printf("\nWorker's Paycode is Selected!\n");

printf("\nEnter the hourly pay: ");

scanf("%lf", &hourly\_pay);

printf("\nEnter the work hours: ");

scanf("%d", &work\_hours);

**if** (work\_hours > 40)

{

extra\_pay = (work\_hours - 40) \* (1.5) \* hourly\_pay;

total = (40 \* hourly\_pay) + extra\_pay;

}

**else**

{

total = work\_hours \* hourly\_pay;

}

printf("\nSalary of Worker is %.2lf$.\n", total);

**break**;

case 3:

printf("\nCommision Worker's Paycode is Selected!\n");

printf("\nEnter the weekly sales of the Worker: ");

scanf("%lf", &weekly\_sales);

comission\_pay = 250 + (0.057 \* weekly\_sales);

printf("\nSalary of Commission Worker is %.2lf$.\n", comission\_pay);

**break**;

case 4:

printf("\nPieceworker's Paycode is Selected!\n");

printf("\nEnter the Worth of Pieceworker's Item: ");

scanf("%lf", &p\_item);

printf("\nEnter the number of items sold : ");

scanf("%lf", &n\_item);

pieceworker\_pay = p\_item \* n\_item;

printf("\nSalary of Pieceworker is %.2lf$.\n", pieceworker\_pay);

**break**;

default :

printf("Entered paycode does not exist.\n");

}

}

system("pause");

}

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