

**NATIONAL UNIVERSITY OF SCIENES & TECHNOLOGY**

**Fundamentals of Programming (CS114)**

**Assignment # 3**

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**Class:** BEE-12-C

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**CS114 Fundamentals of Programming**

**Assignment 3**

**Deadline: 13th December 2020, 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:**

Modify the upc.c program given in section 4.1 of your textbook so that it checks whether a UPC is valid. After the user enters a UPC, the program will display either VALID or NOT VALID.

#**include** <stdio.h>

**int** **main**(**void**)

{

**int** d, i1, i2, i3, i4, i5, j1, j2, j3, j4, j5,

first\_sum, second\_sum, total, check, check\_s;

printf("Enter the first (single) digit: ");

scanf("%1d", &d); // input from user

printf("Enter first group of five digits: ");

scanf("%1d%1d%1d%1d%1d", &i1, &i2, &i3, &i4, &i5);

printf("Enter second group of five digits: ");

scanf("%1d%1d%1d%1d%1d", &j1, &j2, &j3, &j4, &j5);

printf("Enter check digit: ");

scanf("%1d", &check); // input from user

first\_sum = d + i2 + i4 + j1 + j3 + j5;

second\_sum = i1 + i3 + i5 + j2 + j4;

total = 3 \* first\_sum + second\_sum;

check\_s = 9 - (total - 1) % 10;

**if (**check == check\_s) // checks if input check

printf("Valid UPC CODE"); // is equal to calculated one

**else** printf("Invalid UPC CODE");

**return** 0;

}

**Question 2:**

Using **Nested If** statements, write a program that finds the largest and smallest of four integers entered by the user.

#**include** <stdio.h>

**int** **main**(**void**) {

**int** a, b, c, d, big1, big2, small1, small2;

printf("\n Enter value to a, b, c, d: ");

scanf("%d %d %d %d", &a, &b, &c, &d);

// we make two groups 1 and 2 of a,b and c,d

**if**(a>b) // nested for largest number (1)

big1 = a;

**else** big1 = b;

**if**(c>d) // nested for largest number (2)

big2 = c;

**else** big2 = d;

**if**(big1>big2)

printf("\nThe biggest number is %d", big1);

**else**

printf("\nThe biggest number is %d", big2);

**if**(a<b) // nested for smallest number (1)

small1 = a;

**else** small1 = b;

**if**(c<d) // nested for smallest number (2)

small2 = c;

**else** small2 = d;

**if**(small1<small2)

printf("\nThe smallest number is %d", small1);

**else**

printf("\nThe smallest number is %d", small2);

**return** 0;

}

**Question 3:**

The simple interest on a loan is calculated by the following formula:

In year 2020, interest rate in Pakistan varied and is given in the table below. Write a program that takes principal (amount borrowed), month of the year (numeric value) and days for several loans as inputs, calculate and displays the simple interest for each loan.

|  |  |
| --- | --- |
| Month | Rate |
| June | 7% |
| May | 8% |
| April | 9% |
| March | 11% |
| Any other month | 12.5% |

#**include**<stdio.h>

**int** **main**()

{

**float** borrow, rate, interest, days;

**int** month;

printf("Enter the amount borrowed, month and days: \n");

scanf("%f:%d:%f", &borrow, &month, &days);

**switch** (month) {

**case** 6:

rate = 0.07;

interest = (borrow \* rate \* days) / 365;

printf("Interest = %.2f", interest);

**break**;

**case** 5:

rate = 0.08;

interest = (borrow \* rate \* days) / 365;

printf("Interest = %.2f", interest);

**break**;

**case** 4:

rate = 0.09;

interest = (borrow \* rate \* days) / 365;

printf("Interest = %.2f", interest);

**break**;

**case** 3:

rate = 0.11;

interest = (borrow \* rate \* days) / 365;

printf("Interest = %.2f", interest);

**break**;

**default**:

rate = 0.125;

interest = (borrow \* rate \* days) / 365;

printf("Interest = %.2f", interest);

**break**;

}

**return** 0;

}

**Question 4:**

Modify the following code to produce the output shown. Use proper indentation techniques. You may not make any changes other than inserting braces.

**if** ( y == 8 )

**if** ( x == 5 )

printf( "@@@@@" );

**else**

printf( "#####" );

printf( "$$$$$" );

printf( "&&&&&" );

1. **Assuming x = 5 and y = 8, the following output is produced.**



**Solution:**

**if** ( y == 8 )

**if** ( x == 5 )

printf( "@@@@@" );

**else**

printf( "#####" );

printf( "$$$$$" );

printf( "&&&&&" );

1. **Assuming x = 5 and y = 8, the following output is produced**



**if** ( y == 8 )

**if** ( x == 5 )

printf( "@@@@@" );

**else** {

printf( "#####" );

printf( "$$$$$" );

printf( "&&&&&" );**}**

1. **Assuming x = 5 and y = 8, the following output is produced**



**if** ( y == 8 )

**if** ( x == 5 )

printf( "@@@@@" );

**else {**

printf( "#####" );

printf( "$$$$$" );**}**

printf( "&&&&&" );

**Question 5:**

The following table shows the postcode of different cities of Pakistan. Write a switch statement whose controlling expression is the postcode. If the value of postcode is in the table, the switch statement will print the corresponding city name. Otherwise, the switch statement will display the message “Postcode is not valid”

|  |  |
| --- | --- |
| Postcode | City |
| 74800 | Karachi |
| 54000 | Lahore |
| 44000 | Islamabad |
| 25000 | Peshawar |
| 87300 | Quetta |

#**include**<stdio.h>

**int** **main**(){

**int** postcode;

printf("Enter a Postcode: ");

scanf("%d", &postcode);

**switch**(postcode){

**case** 74800:

printf("Karachi");

**break**;

**case** 54000:

printf("Lahore");

**break**;

**case** 44000:

printf("Islamabad");

**break**;

**case** 25000:

printf("Peshawar");

**break**;

**case** 87300:

printf("Quetta");

**break**;

**default**:

printf("Postcode is not valid");

}

**return** 0;

}

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