North South University
Department of Computer Science and Engineering
Course: -CSE115

Mid Term Exam, Fall 2020, Time: 1 Hour 30 Minutes

Please answer all the questions, Total Points: 50

Instruction

Show all your work where necessary.

Submit .c files for programming question (Q4-Q7). Comment your program where necessary. In addition, use comments to write your name and ID in the C file.

Put all your work in a folder and upload within the specified time limit. Plagiarism of any form will be strictly handled.

Q1) Short Questions and Answers: (10 points)

a) Name the main categories of software. Give examples in each case. (2)

b) Write about the 3 categories of computer languages with example. (3)

c) Convert from Hexadecimal to Octal. $(C4E.5B)_{16} = (?)_8$. Show your work (3)

d) Find out which variable names are invalid and why? (2)

99Hello, **iteaM**, **Switch**, **_avg_value** , **double**, **,avg_value**

Q2 Find the output:(5 points)

Q2a) Find the output (show your work) (3points)

i)
```
#include <stdio.h>
void main(){
int a = -6;
printf("%d", ++a*4+1);
printf("\n%d", a+3);
                }
```

ii)
```
#include<stdio.h>
void main (){
    int a=11,b=3,d=5;
    float c,e=2;
     c=7/2;
     d=5*0.5;
      printf("%d \n",a/b);
      printf("%f \n" ,a/e);
      printf("%f \n",c);
      printf("%d \n",d);
                    }
```

Q2b) Trace the program, show how the variable value changes for every iteration and the show the output of the code snippet from a C program. (2points)

```
{ int i = 0, j = 1;
        while(i <= 6)
            {   printf("\n%d \t %d", i, j);
                    i++;
                     j += 4;}}
```

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Q3) Modify the following code to produce the output shown. Use proper indentation techniques. **You may not make any changes other than inserting braces.** The compiler ignores the indentation in a program. We eliminated the indentation from the following code to make the problem more challenging. [Note: It's possible that no modification is necessary.] (5 points)

```
if ( y == 8 )
if ( x == 5 )
printf( "@@@@@\n" );
else
printf( "#####\n" );
printf( "$$$$$\n" );
printf( "&&&&&\n" );
```

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

```
@@@@@
$$$$$
&&&&&
```

Q4) Due to financial problems, it was necessary for Bank A to cut customers' credit limits in quarter. So, if credit limit was Tk8000 previously, it's now Tk2000. Write a program to find the credit status of five customers given each customer's account number, credit limit before financial problem and customer's current balance.

i) As a requirement for the design phase of the software, draw the flowchart and write pseudo code for the problem stated above .(5 points)

ii) Write a full C programming based on the pseudo code you create.(5 points)

Expected Outputs: Print the new credit limit for each customer
Print if customers have current balances that exceed their new credit limits.

Q5) Write a C program to calculate the average of a set of integer numbers with values entered one after the other. Use negative number at the end but do not include it in the calculation of sum and average. Print the sum and average. (5 points)

Q6) Create a function that can count the number of digits in a positive integer. User will provide that positive integer in the main function and the program will display the count. Write the full code showing function calls from main (). (5 points)

Example: if n=5782, result will be 4.

Function Prototype: int count_digit (int n);

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Q7) Write a code in C for the following scenario: (10 points)

Consider a hospital scenario where "z" number of patients wants to undertake some medical examination. Each patient registers for "t" number of tests and the test to be conducted is determined by qualified doctors after listening symptoms. Each test cost is different and hence each test is identified by the price paid. Write a program to read the cost for the tests undertaken by each patients and print the total bill paid by each patient. Then the program should decide if the patient is very ill, moderately ill and ok (Very ill: Pay Bill Tk2000 and above, Moderately ill: Pay Bill between Tkl999 and Tk500, ok: Pay Bill below Tk500)

Expected Output:

Enter number of patients and tests
2 4
Patient id: 1
Cost for 4 tests for patient ID :1
100 150 50 20
Total : TK320
You are OK . Good day.

Patient id: 2
Price for 4 tests for patient ID :2
100 500 600 1000
Total : TK 2200
You are very ill. Do not panic. Our doctors are here to help.

BEST OF LUCK

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Operators Precedence & Associativity Table

Operator	Meaning of operator	Associativity
()	Functional call	Left to right
[]	Array element reference	
->	Indirect member selection	
.	Direct member selection	
!	Logical negation	Right to left
~	Bitwise(1 's) complement	
+	Unary plus	
-	Unary minus	
++	Increment	
--	Decrement	
&	Dereference (Address)	
*	Pointer reference	
sizeof	Returns the size of an object	
(type)	Typecast (conversion)	
*	Multiply	Left to right
/	Divide	
%	Remainder	
+	Binary plus(Addition)	Left to right
-	Binary minus(subtraction)	
<<	Left shift	Left to right
>>	Right shift	
<	Less than	Left to right
<=	Less than or equal	

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>	Greater than	
>=	Greater than or equal	
==	Equal to	Left to right
!=	Not equal to	
&	Bitwise AND	Left to right
^	Bitwise exclusive OR	Left to right
|	Bitwise OR	Left to right
&&	Logical AND	Left to right
||	Logical OR	Left to right
?:	Conditional Operator	Right to left
=	Simple assignment	Right to left
*=	Assign product	
/=	Assign quotient	
%=	Assign remainder	
+=	Assign sum	
-=	Assign difference	
&=	Assign bitwise AND	
^=	Assign bitwise XOR	
|=	Assign bitwise OR	
<<=	Assign left shift	
>>=	Assign right shift	
,	Separator of expressions	Left to right

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