**Year 1**

**Tutorial 8**

**IT1010**  **– Introduction to Programming** **Semester 1, 2020**

# Question 1

Show the value of x after each of the following statements is performed:

1. x = floor(7.5) 🡪 7
2. x = ceil (0.0) 🡪 0
3. x = ceil (-6.4) 🡪 -6
4. x = log10(100.0) 🡪 2
5. x = ceil (floor (-5.5)) 🡪 -6

# Question 2

Write a function called circleArea() that take the radius of a circle as an argument and calculate and return the area. In the main program read the radius value from the user, call circleArea() and display the result.

#include <stdio.h>  
#include <math.h>  
  
void circleArea();  
  
int main() {  
  
 int areaRadius;  
  
 printf("Input an area :");  
  
 scanf("%d", &areaRadius);  
  
 printf("Radius is :%d\n", areaRadius);  
  
 circleArea(areaRadius);  
  
  
}  
  
void circleArea(int radius) {  
  
 float result = 0;//create variable and initialize it as 0  
  
 result = (22 / 7.0) \* pow(radius, 2);//calculate results of the circle area  
  
 printf("Area of The Circle is :%.2f", result); // display the Results  
}

# Question 3

Write three functions do the following



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**add** - add two integers pass as parameters and return the result

**multiply -** multiply two integers pass as parameters and return the result

**square** – receive an integer as a parameter and return the result after multiplying the number by itself.

Use these functions in the main program to calculate the result of the following mathematical expression. (3\*4 + 5\*7) 2

#include <stdio.h>  
#include <math.h>  
  
int add(int num0, int num02);  
  
int multiply(int num0, int num02);  
  
int square(int num);  
  
int main() {  
  
// (3\*4 + 5\*7) 2  
  
 int result01 = multiply(3, 4);// 3\*4

int result02 = multiply(5, 7);// + 5\*7

int result03 = add(result01, result02);// (3\*4 + 5\*7)

int mainResult = square(result03);// (3\*4 + 5\*7) 2  
  
 printf("Result is %d", mainResult);  
  
  
}  
  
int add(int num0, int num02) {  
 int results = 0;  
  
 results = num0 + num02;  
  
 printf("Add Result is :%d\n", results);  
  
 return results;  
  
}  
  
int multiply(int num0, int num02) {  
 int results = 0;  
  
 results = num0 \* num02;  
  
 printf("Multiply Result is :%d\n", results);  
  
 return results;  
}  
  
int square(int num) {  
 int results = 0;  
  
 results = pow(num, 2);  
  
 printf("Square Result is :%d\n", results);  
  
 return results;  
}

**Additional Exercises**

# Question 1

i) Write a function that displays a solid square of asterisks whose side is specified in integer parameter *side*. For example, if *side* is 4, the function displays

\*\*\*\*

\*\*\*\*

# \*\*\*\*

# \*\*\*\*

#include <stdio.h>  
  
void display(int x);  
  
int main() {  
  
 int x;  
  
 printf("Input an Integer :");  
  
 scanf("%d", &x);  
  
 display(x);  
  
 return 0;  
  
}  
  
void display(int x) {  
  
 for (int i = 0; i < x; ++i) {  
 for (int j = 0; j < x; ++j) {  
 printf("\*");  
 }  
 printf("\n");  
 }  
  
}

ii) Modify the function created in i) above to form the square out of the character contained in character parameter *fillCharacter*. Thus if *side* is 3 and *fillCharacter*

is “#”, then this function should print

**###**

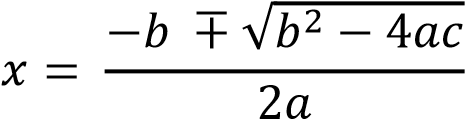
**###**

**###**

#include <stdio.h>  
  
void display(int x, char ch);  
  
int main() {  
  
 int x;  
  
 char ch = '#';  
  
 printf("Input an Integer :");  
  
 scanf("%d", &x);  
  
 display(x, ch);  
  
 return 0;  
  
}  
  
void display(int x, char ch) {  
  
 for (int i = 0; i < x; ++i) {  
 for (int j = 0; j < x; ++j) {  
 printf("%c", ch);  
 }  
 printf("\n");  
 }  
  
}

# Question 2

The roots of a function can be calculated as given below.



Write a C program to input any three values for a, b, c and to calculate the roots.

Hint : Use pow and sqrt function in math library.

# Question 3

You are asked to write a C program to calculate the final mark and grade of 5 students for a subject.

1. Write a function called **calcFinalMark()** to calculate the final mark of the subject. When calculating the final mark, 30% is taken from the assignment mark and 70% is taken from the paper mark. Function should return the final mark. Assignment mark and paper mark are given as parameters to the functions.

float calcFinalMark(float assignmentMark, float paperMark);

1. Write a function called **findGrades()** to return the grade obtained for the given final mark.

Grades are calculated as follows:

char findGrades(float finalMark);

|  |  |
| --- | --- |
| Final mark | Grade |
| Mark >= 75 | A |
| 60 <= Mark < 75 | B |
| 50 <= Mark <60 | C |
| Mark <50 | F |

1. Write a function called **printDetails()** to print the name, final mark and the grade of a student.

Your output should be as follows:

Name Final Mark Grade

-------- -------------- --------

. . . . . . . . . . . . . . . . . . . . .

void printDetails(char name[],float assignmentMark, float paperMark);

1. In your main function, ask the user to enter the name, assignment marks (out of 100) and the paper mark(out of 100) of the 5 students from the keyboard. Allow the user to enter the paper mark only if the student has got more than 50% for the assignment mark. If not the paper mark is considered as zero. Display the name, final mark and the grade of a student using the function written in section c).

#include <stdio.h>  
  
float calcFinalMark(float assignmentMark, float paperMark);  
  
char findGrades(float finalMark);  
  
void printDetails(char name[], float finalMarks, char grade);  
  
int main() {  
  
 int count = 0;  
  
 float assignment;  
  
 float paperMarks = 0;  
  
 float final\_Marks;  
  
 char grade;  
  
 char name[10];  
  
  
 while (count != 5) {  
  
 printf("\nEnter The Name :");  
 scanf("%s", &name);  
  
 printf("\nEnter Assignment Marks :");  
 scanf("%f", &assignment);  
  
 if (assignment > 50) {  
 printf("\nEnter Paper Marks :");  
 scanf("%f", &paperMarks);  
  
 final\_Marks = calcFinalMark(assignment, paperMarks);  
 }  
  
 final\_Marks = calcFinalMark(assignment, paperMarks);  
  
  
 grade = findGrades(final\_Marks);  
  
 printDetails(name, final\_Marks, grade);  
  
 count++;  
 }  
  
  
 return 0;  
  
}  
  
float calcFinalMark(float assignmentMark, float paperMark) {  
 float finalMarks;  
  
 finalMarks = assignmentMark \* 30 / 100;  
 finalMarks += paperMark \* 70 / 100;  
  
 return finalMarks;  
  
}  
  
char findGrades(float finalMark) {  
  
 if (finalMark < 50) {  
 return 'F';  
 } else if (finalMark <= 60) {  
 return 'C';  
 } else if (finalMark <= 75) {  
 return 'B';  
 } else if (finalMark > 75) {  
 return 'A';  
 }  
  
}  
  
void printDetails(char name[], float finalMarks, char grade) {  
  
 /\* printf("\nName\t\tFinal Marks\t\tGrade\n");  
 printf("\n%s\t", name);  
 printf("%f\t", finalMarks);  
 printf("%c\t\t", grade);\*/  
  
 printf("\nName \t\tFinal Marks \tGrade \n%s\t%f\t%c", name, finalMarks, grade);  
}

- Reference : C How to Program (Eighth Edition) by Paul Deitel, Harvey Deitel