Lab instructions

Week 02

Introduction to Programming
ECS 102, 2018-19 Semester II

IISER Bhopal

decimal.c

```
#include <stdio.h>
void main()
{
    float amount1 = 0.5;
    float amount2 = 0.25;
    float amount3 = 0.75;
    float amount4 = 0.875;
    float amount5 = 0.1;
    float amount6 = 0.2;
    float amount7 = 0.8;
    float amount8 = 0.9;
    printf("amount (exactly stored): %11.10f, %11.10f, %11.10f, %11.10f\n", amount1,
    amount2, amount3, amount4);
    printf("amount (not exactly stored): %11.10f, %11.10f, %11.10f, %11.10f\n", amount5,
    amount6, amount7, amount8);
}
```

Computer stores binary information

Depending on the decimal value, computer may not be able to store the exact floating point value

round.c

```
#include <stdio.h>
void main()
{
    short int number1 = 32768;
    short int number2 = 32769;
    short int number3 = -32768;
    short int number4 = -32769;

    printf("number1(=32768): %d\n", number1);
    printf("number2(=32769): %d\n", number2);
    printf("number3(=-32768): %d\n", number3);
    printf("number4(=-32769): %d\n", number4);
}
```

The data type “short int” is of size 16 bits

It can only store data between -32768 to 32767

use_math.c

```
#include <stdio.h>
#include <math.h>
#define   PI        3.1416
#define   MAX       180
void main()
{
        float angle = 90;
        float angle_radian = (PI/MAX)*angle;
        float sin_angle = sin(angle_radian);
        float cos_angle = cos(angle_radian);
        float tan_angle = tan(angle_radian);

        printf("sin(angle): %5.2f\n", sin_angle);
        printf("cos(angle): %5.2f\n", cos_angle);
        printf("tan(angle): %5.2f\n", tan_angle);
}
```

Explain the answers

qudratic.c

For a quadratic equation

$$ax^2 + bx + c = 0$$

write a program to calculate the roots.

Hints: Use **sqrt** similar to **sin**/**cos**/**tan** functions in **math.h**

interest_rate.c

```
#include <stdio.h>

void main()
{
        float amount = 1000;
        float interest_rate = 0.12;

        float amount_1st_year = amount + interest_rate*amount;
        printf("Amount after 1st year: %6.2f\n", amount_1st_year);

        // Determine the amount after 2nd year
}
```

Determine the amount after 2nd year