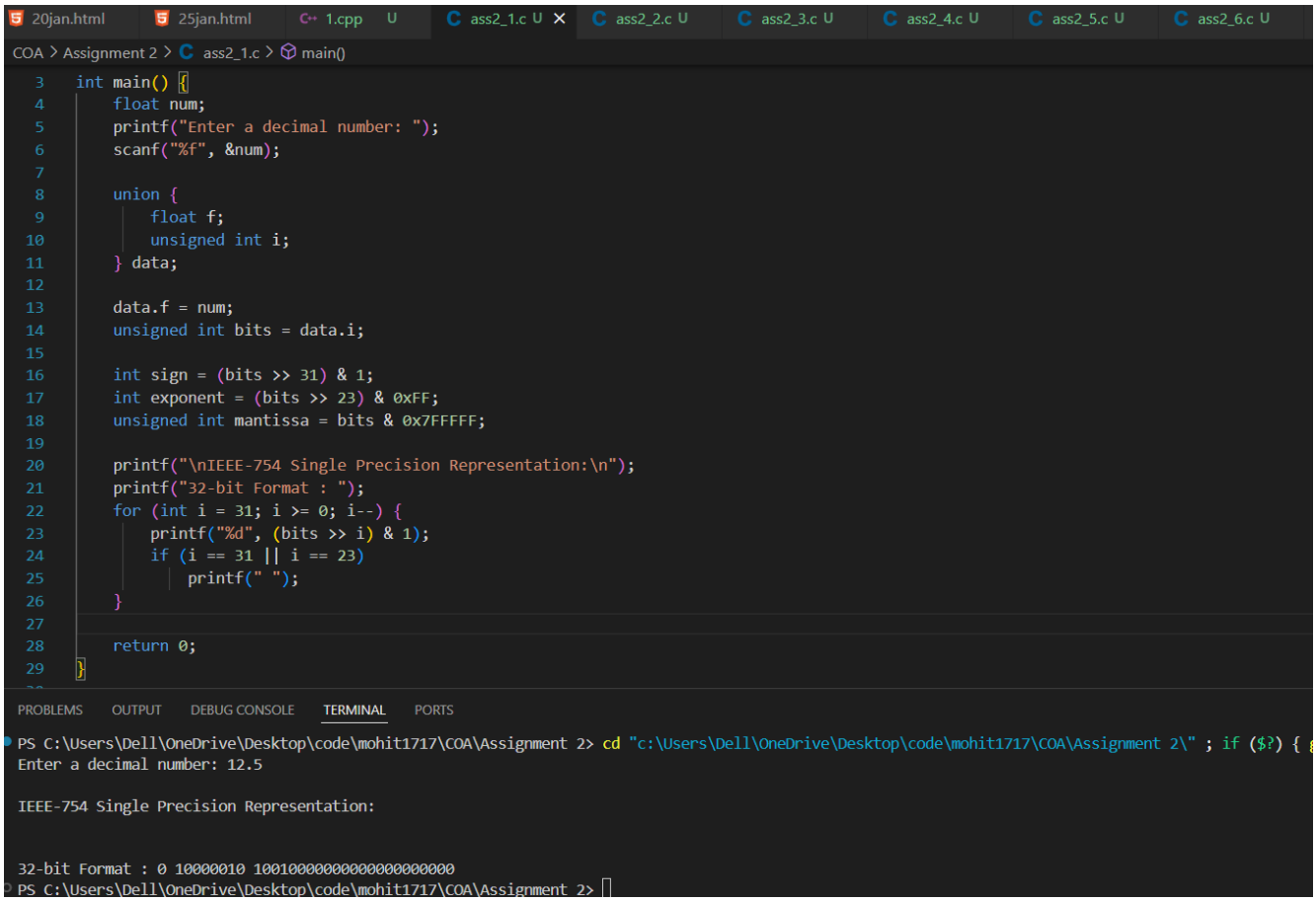
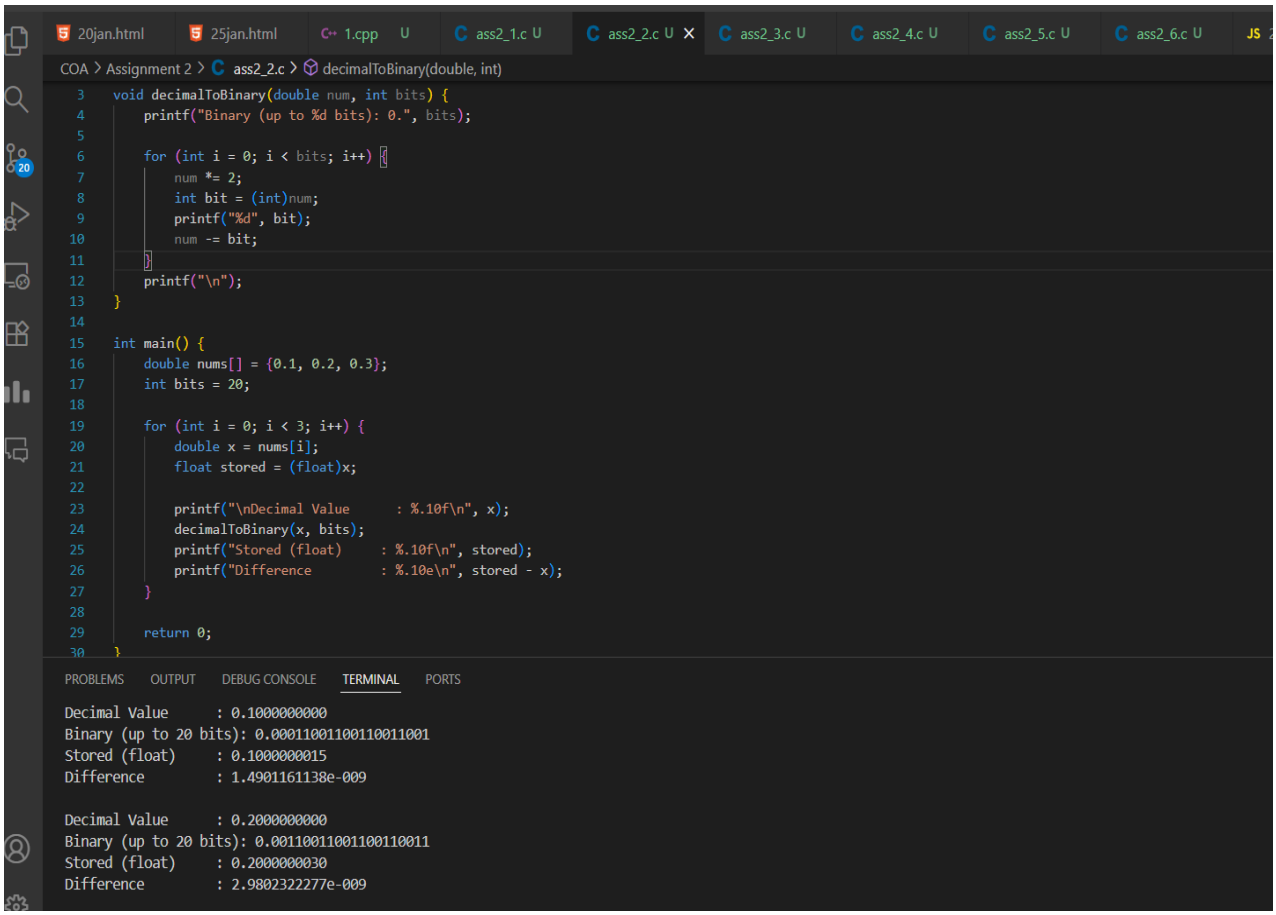
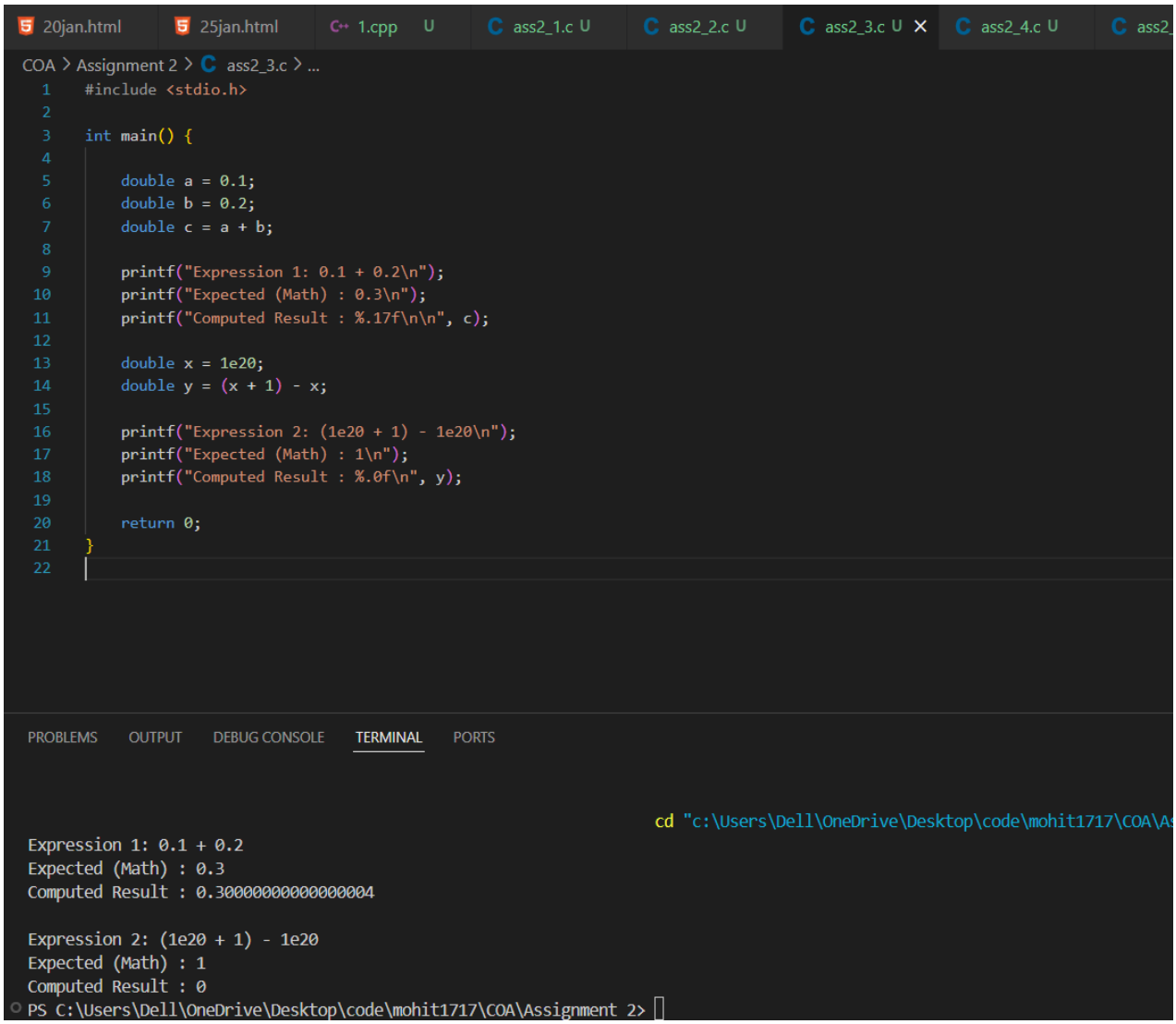
Q 1


20jan.html
25jan.html
1.cpp U
ass2_1.c U
ass2_2.c U
ass2_3.c U
ass2_4.c U
ass2_5.c U
ass2_6.c U
COA > Assignment 2 > ass2_1.c > main()
int main() {
float num;
printf("Enter a decimal number: ");
scanf("%f", &num);
union {
float f;
unsigned int i;
} data;
data.f = num;
unsigned int bits = data.i;
int sign = (bits >> 31) & 1;
int exponent = (bits >> 23) & 0xFF;
unsigned int mantissa = bits & 0x7FFFFF;
printf("\nIEEE-754 Single Precision Representation:\n");
printf("32-bit Format : ");
for (int i = 31; i >= 0; i--) {
printf("%d", (bits >> i) & 1);
if (i == 31 || i == 23)
printf(" ");
}
return 0;
}
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
PS C:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2> cd "c:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2\" ; if ($?) { g
Enter a decimal number: 12.5
IEEE-754 Single Precision Representation:
32-bit Format : 0 10000010 10010000000000000000000
PS C:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2>

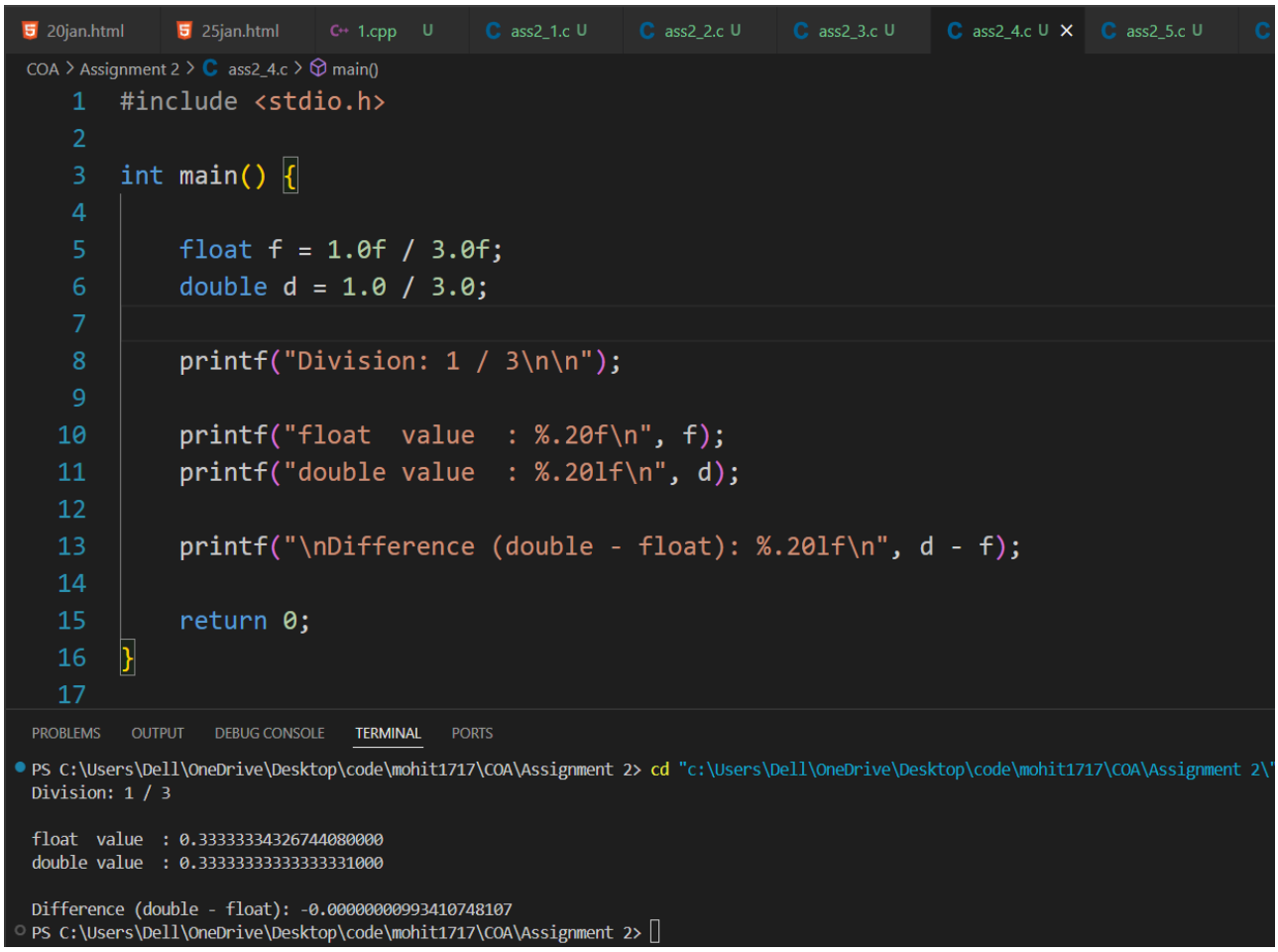
Q 2


20jan.html
25jan.html
1.cpp U
ass2_1.c U
ass2_2.c U
ass2_3.c U
ass2_4.c U
ass2_5.c U
ass2_6.c U
COA > Assignment 2 > ass2_2.c > decimalToBinary(double, int)
void decimalToBinary(double num, int bits) {
printf("Binary (up to %d bits): 0.", bits);
for (int i = 0; i < bits; i++) {
num *= 2;
int bit = (int)num;
printf("%d", bit);
num -= bit;
}
printf("\n");
}
int main() {
double nums[] = {0.1, 0.2, 0.3};
int bits = 20;
for (int i = 0; i < 3; i++) {
double x = nums[i];
float stored = (float)x;
printf("\nDecimal Value : %.10f\n", x);
decimalToBinary(x, bits);
printf("Stored (float) : %.10f\n", stored);
printf("Difference : %.10e\n", stored - x);
}
return 0;
}
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Decimal Value : 0.1000000000
Binary (up to 20 bits): 0.00011001100110011001
Stored (float) : 0.1000000015
Difference : 1.4901161138e-009
Decimal Value : 0.2000000000
Binary (up to 20 bits): 0.00110011001100110011
Stored (float) : 0.2000000030
Difference : 2.9802322277e-009

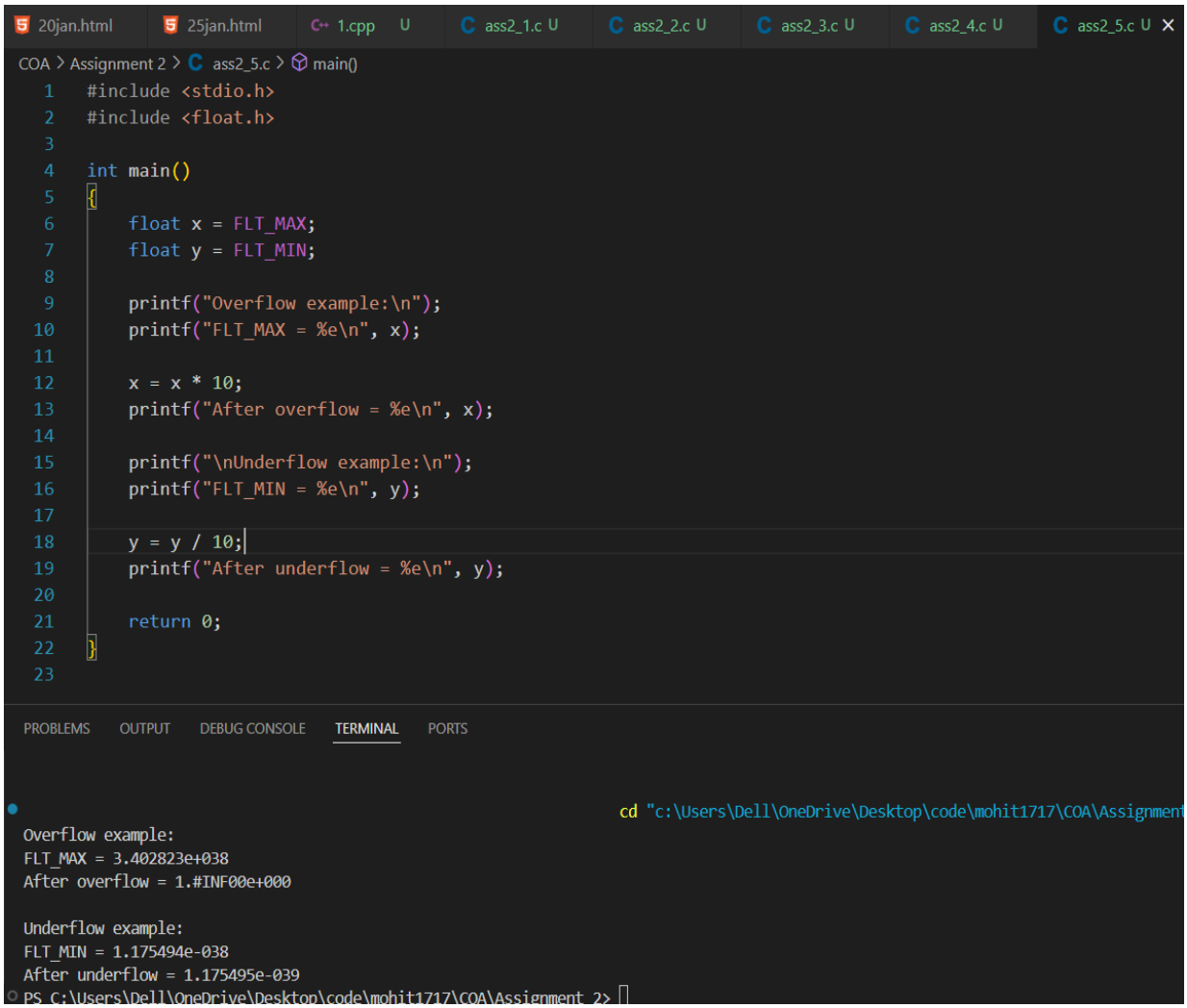
Q3


20jan.html
25jan.html
1.cpp U
ass2_1.c U
ass2_2.c U
ass2_3.c U
ass2_4.c U
COA > Assignment 2 > ass2_3.c > ...
#include <stdio.h>
int main() {
double a = 0.1;
double b = 0.2;
double c = a + b;
printf("Expression 1: 0.1 + 0.2\n");
printf("Expected (Math) : 0.3\n");
printf("Computed Result : %.17f\n\n", c);
double x = 1e20;
double y = (x + 1) - x;
printf("Expression 2: (1e20 + 1) - 1e20\n");
printf("Expected (Math) : 1\n");
printf("Computed Result : %.0f\n", y);
return 0;
}
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
cd "c:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\A
Expression 1: 0.1 + 0.2
Expected (Math) : 0.3
Computed Result : 0.30000000000000004
Expression 2: (1e20 + 1) - 1e20
Expected (Math) : 1
Computed Result : 0
PS C:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2>

Q4


20jan.html
25jan.html
1.cpp U
ass2_1.c U
ass2_2.c U
ass2_3.c U
ass2_4.c U
ass2_5.c U
COA > Assignment 2 > ass2_4.c > main()
#include <stdio.h>
int main() {
float f = 1.0f / 3.0f;
double d = 1.0 / 3.0;
printf("Division: 1 / 3\n\n");
printf("float value : %.20f\n", f);
printf("double value : %.20lf\n", d);
printf("\nDifference (double - float): %.20lf\n", d - f);
return 0;
}
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
PS C:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2> cd "c:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2\"
Division: 1 / 3
float value : 0.33333334326744080000
double value : 0.33333333333333331000
Difference (double - float): -0.00000000993410748107
PS C:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2>

Q 5


20jan.html
25jan.html
1.cpp U
ass2_1.c U
ass2_2.c U
ass2_3.c U
ass2_4.c U
ass2_5.c U
COA > Assignment 2 > ass2_5.c > main()
#include <stdio.h>
#include <float.h>
int main()
{
float x = FLT_MAX;
float y = FLT_MIN;
printf("Overflow example:\n");
printf("FLT_MAX = %e\n", x);
x = x * 10;
printf("After overflow = %e\n", x);
printf("\nUnderflow example:\n");
printf("FLT_MIN = %e\n", y);
y = y / 10;
printf("After underflow = %e\n", y);
return 0;
}
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
cd "c:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment
Overflow example:
FLT_MAX = 3.402823e+038
After overflow = 1.#INF00e+000
Underflow example:
FLT_MIN = 1.175494e-038
After underflow = 1.175495e-039
PS C:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\Assignment 2>

Q 6

COA > Assignment 2 > ass2_6.c > main()

```c
#include<stdio.h>
#include<float.h>

int main(){

    float num= FLT_MIN;

    printf("Normalized minimum values : %e\n",num);

    num=num/2;
    printf("Subnormal value : %e\n",num);


return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
cd "c:\Users\Dell\OneDrive\Desktop\code\mohit1717\COA\A
Normalized minimum values : 1.175494e-038
Subnormal value : 5.877472e-039
```