Homework Questions of 8/02/2023

Ques 1 Write a program to reverse an integer. Suppose that we are given a number n = 123. We have to print the output as reversed number & this will be 321.

ans = 0

1 2 3

↓

ans * 10 + digit

0 × 10 + 3 = 0 + 3 = 3 → ans

ans * 10 + digit

3 × 10 + 2 = 30 + 2 = 32 → ans

Now picking 1

1 2 3

↳ ans * 10 + digit

32 x 10 + 1 = 320 + 1 = 321

Hence 321 is the reversed number.

Code
```
int ans = 0
int num = -124;
int temp = num;
num = abs(num);
while (num > 0) {
    int digit = num % 10;
    ans = ans * 10 + digit;
    num = num / 10;
}
if (temp < 0) {
    ans = -ans;
}
cout << ans;
```
→ If i/p integer is negative, then reversed number will be negative as well.

Ques 2 Write a program to set the ith bit. To set the ith bit means to make the ith bit as 1.

Suppose we are given a number = 3

3 → 000 ... 011

We have to set the 2nd bit. After setting the 2nd bit to 1, the number will change to 7

000 ... 0111

Now we have to think of a bitwise operator which can do this.

1 & 0 = 0
1 | 0 = 1

Bitwise OR will do the job as if any of the bit is 1, then it gives 1 as the output.

n = 3 , i = 2
Let's left shift 1 by 2 times.

1 → 000--001
1 << 2 → 00--010 → 00--100

Now 00--100 will be 1 by the i/p number which was 3.

00--100 | 000--011 = 000--111 = 7
Hence we got the desired result.

Code

```
void setIthBit (int n, int i) {
        int ans = 1 << i;
        ans = ans | n;
        cout << ans << endl;
}
```

Ques 3 Write a program to convert Celsius to Fahrenheit.
Formulae for conversion is

$$F = \frac{9}{5}C + 32$$

Code

```
void convertToF (float temp){

    float F = (9*temp)/5 +32;
    cout << F <<endl;
}
int main(){
    float temp = 37.3;
    convertToF (temp);
    return 0;
}
```

Ques 4 Why there is infinite number of set bits in the negative number from code of count no. of set bits in a number? (Pg 114 Ques 3)

Ans If we perform the right shift operation on a negative number in VS code compiler, then at max it is going -1 and hence it has 2 set bits always & hence we can say there was infinite supply on the no. of set bits.