REPORT

Results of 5 different values of x:

When x = 5, the first natural number, whose factorial divides x is 5
i.e., $r11 = 5
The final result in gdb (using display command) when x = 5 (along with the other registers)
1: $rax = 60 # sys call 60 on exit
2: $r8 = 5 # x
3: $r9 = 5 # i
4: $r10 = 24 # factorial
5: $r11 = 5 # final result in r11

When x = 416, the first natural number, whose factorial divides x is 13
i.e., $r11 = 13
The final result in gdb (using display command) when x = 416
1: $rax = 60 # sys call 60 on exit
2: $r8 = 416 # x
3: $r9 = 13 # i
4: $r10 = 6227020800 # factorial
5: $r11 = 13 # final result in r11

When x = 20, the first natural number, whose factorial divides x is 5
i.e., $r11 = 5
The final result in gdb (using display command) when x = 20
1: $rax = 60 # sys call 60 on exit
2: $r8 = 20 # x
3: $r9 = 5 # i
4: $r10 = 120 # factorial
5: $r11 = 5 # final result in r11

When x = 100, the first natural number, whose factorial divides x is 10
i.e., $r11 = 10
The final result in gdb (using display command) when x = 100
1: $rax = 60 # sys call 60 on exit
2: $r8 = 100 # x
3: $r9 = 10 # i
4: $r10 = 3628800 # factorial
5: $r11 = 10 # final result in r11

When x = 17, the first natural number, whose factorial divides x is 17
i.e., $r11 = 17
The final result in gdb (using display command) when x = 17
1: $rax = 60 # sys call 60 on exit
2: $r8 = 17 # x
3: $r9 = 17 # i
4: $r10 = 20922789888000 # factorial
5: $r11 = 17 # final result in r11

Values of x, whose factorial calculation will overflow:

Given a number x, your task is to find first natural number i whose factorial is divisible by x.

So, Let us consider unsigned integers (since natural numbers are given)

The number which overflows in 64 – bit is (2^64) = 18,446,744,073,709,552,000
The number whose factorial will overflow in 64 – bit = 21

21! = 51,090,942,171,709,440,000

The number which overflows in 32 – bit is (2^32) = 4,294,967,296
The number whose factorial will overflow in 32 – bit = 13

13! = 6,227,020,800

The number which overflows in 16 – bit is (2^16) = 65,536
The number whose factorial will overflow in 16 – bit = 9

9! = 362,880

The number which overflows in 8 – bit is (2^8) = 256
The number whose factorial will overflow in 8 – bit = 6

6! = 720