

OUTPUTS:

I am storing the values for x by mov in %r8 and the answer is in %r11

1) %r8 = 13

Ans: 13

2) %r8 = 6

Ans: 3

3) %r8 = 24

Ans = 4

4) %r8 = 7

Ans=7

5) %r8=10

ans=5

OVERFLOW:

The least value of x for which overflow occurs is 23.

Explanation:

Since it is prime it will calculate 23! which is 2.5×10^{22} but the 64 bit register can store only upto 1.8×10^{19} . The Prime Number before that is 19 but 19! is 1.21×10^{17} , So it won't overflow. So the least value of x for which overflow occurs is 23.

For General Cases of Factorial Calculations the overflow occurs at:

8-bit register : for signed and unsigned the overflow occurs at 5!

16-bit register : for signed it occurs at 7! and for unsigned it occurs at 8!

32-bit register: for signed and unsigned it occurs at 12!

64-bit register: for signed and unsigned it occurs at 20!