Big integers addition

Write a C program that adds two very large integers of up to 100 digits each. The program should be able to handle integers with different lengths and should output the result as a single integer.

Input

12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

98765432109876543210987654321098765432109876543210987654321098765432109876543210987654321098765432109876543210

Output

22222222112222222211222222221122222222112222222211222222221122222222112222222211222222221122222222112222222211

Large sum

Work out the first ten digits of the sum of the following one-hundred 50-digit numbers.

37107287533902102798797998220837590246510135740250

46376937677490009712648124896970078050417018260538

74324986199524741059474233309513058123726617309629

91942213363574161572522430563301811072406154908250

23067588207539346171171980310421047513778063246676

89261670696623633820136378418383684178734361726757

28112879812849979408065481931592621691275889832738

44274228917432520321923589422876796487670272189318

47451445736001306439091167216856844588711603153276

70386486105843025439939619828917593665686757934951

62176457141856560629502157223196586755079324193331

64906352462741904929101432445813822663347944758178

92575867718337217661963751590579239728245598838407

58203565325359399008402633568948830189458628227828

80181199384826282014278194139940567587151170094390

35398664372827112653829987240784473053190104293586

86515506006295864861532075273371959191420517255829

71693888707715466499115593487603532921714970056938

54370070576826684624621495650076471787294438377604

53282654108756828443191190634694037855217779295145

36123272525000296071075082563815656710885258350721

45876576172410976447339110607218265236877223636045

17423706905851860660448207621209813287860733969412

81142660418086830619328460811191061556940512689692

51934325451728388641918047049293215058642563049483

62467221648435076201727918039944693004732956340691

15732444386908125794514089057706229429197107928209

55037687525678773091862540744969844508330393682126

18336384825330154686196124348767681297534375946515

80386287592878490201521685554828717201219257766954

78182833757993103614740356856449095527097864797581

16726320100436897842553539920931837441497806860984

48403098129077791799088218795327364475675590848030

87086987551392711854517078544161852424320693150332

599594068957565367821070749269665376763262354472 10

697939506796526947425977097391666937630426339870 85

410526847082990852113994273657341161827603150012 71

653786073615010808570091499395125570281987460043 75

358290353174347173269321235781549826297425527373 07

949537597651053059469660676831565743771674018752 75

889028025717332296191766687138199318110487701902 71

252676802760780030136786809925254634010616328665 26

362702185404977055856299465806362379931407462559 62

240744869082311749777923654662572469233228109171 41

914302881971032885978066697608929386382850253334 03

344130655780161278159218150055618688364684200904 70

230530811728164304876237919698424872550366387845 83

114876969321549028104240201383351244621814417734 70

637832994906362596664985876182212252255124867645 33

677201869716985443124195724099139590089523100588 22

955482553002635207815322967962494816419538682187 74

760853271322857231104248034561248676970645079952 36

377742425354112916842768655389262050249103265729 67

237019132757256752856532482582654630922070585965 22

297988602722583319131263751473419948895347657455 01

184957014548792889848568277260777137214037988797 15

382982037830314735277215803481445134913732266513 81

348295438291999181802789165224310273922511228695 39

409579530664052326325380441000596549391598795936 35

297461521855023713076422551211836938035803885849 03

416981162220729771861582366784246891579935329619 22

624679571944012690438771072750481023908955235974 57

231897067725479150615055049539229795309011299675 19

861880882258753145295840992512038290094077707756 72

113067397083047244838165338735023408456470580773 08

829591747671403631980081871290118754913105471265 81

976233310448183862695154563349263665728975634005 00

428462801835170705278318394258821455212272512503 27

551216035469812005817621652128276527516912968977 89

322381957343293399464375019078369457658833523998 86

755061649651847751807381688378610915273579297013 37

621778427521926234019423996391680449839931733127 31

329241857071473495669166746876346609150359146775 04

995186714302352196288948901024233251169136196266 22

732674608005915474718307983928685352069469445407 24

768418225246744171615140364279822733480555562148 18

971426179103425986472045168939894221798260880768 52

877836461827993463137677543078093633330189826420 90

108488025216746708832151201858835432238128769527 86

713296124747824645386369930090493103636197638780 39

621840735723997942234062353938083396513274080111 16

666278919814880877979418768761442300309844908514 11

606618262936828367647447792391803351109890697907 14

857869440895529906536404474255760836599766457950 96

660243964099053896071201982199760475994901972302 97

649139826800329731560371200413779037855660850892 52

167309393198727502754689069037075394130426523150 11

948093772450487951509541009216458637547105984367 91

786391670211874924319957006419179697775990283006 99

153687137119366149528113058763802784107544497330 78

407899231155355625611423224232550336854424889173 53

448899115014406480203690680639606723221932041495 35

415031288803395360532993403680069777106505666319 54

812348806732101467390585685579345814036278227032 80

826165707739483275922328459417065250945123252306 08

229188020587773197198394501808880724296619808111 97

771585425020165450904132458097868827789487218596 17

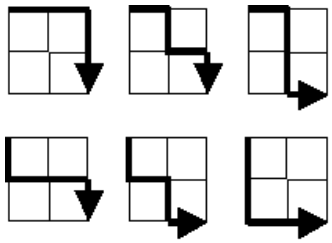
721078384350691861554356628840622574736922845095 16

208496039801340017239306716668235552452528046097 22

535035342264725242508740540755917897812643303316 90

Lattice paths

Starting in the top left corner of a 2×2 grid, and only being able to move to the right and down, there are exactly 6 routes to the bottom right corner.



How many such routes are there through a 20×20 grid?

Coin sums

In the United Kingdom the currency is made up of pound (£) and pence (p). There are eight coins in general circulation:

> 1p, 2p, 5p, 10p, 20p, 50p, £1 (100p), and £2 (200p).

It is possible to make £2 in the following way:

> 1×£1 + 1×50p + 2×20p + 1×5p + 1×2p + 3×1p

How many different ways can £2 be made using any number of coins?

Goldbach's other conjecture

It was proposed by Christian Goldbach that every odd composite number can be written as the sum of a prime and twice a square.

9 = 7 + 2×1^2

15 = 7 + 2×2^2

21 = 3 + 2×3^2

25 = 7 + 2×3^2

27 = 19 + 2×2^2

33 = 31 + 2×1^2

It turns out that the conjecture was false.

What is the smallest odd composite that cannot be written as the sum of a prime and twice a square?