Project Euler

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#1----------

If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. The sum of these multiples is 23. Find the sum of all the multiples of 3 or 5 below 1000.

```
sum = 0
for i in range (0,1000):
  if i%3 == 0 or i%5 == 0:
    sum += i
print (sum)
```

#2----------

Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, … By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

```
a = 1
b = 2
sum = 0
while b < 4000000:
    if b%2 == 0:
        sum += b
    a, b = b, a + b
print (sum)
```

#3----------

The prime factors of 13195 are 5, 7, 13 and 29. What is the largest prime factor of the number 600851475143 ?

```
x = int(input())
res = []
res2 = []
for i in range (2,int(x ** 0.5)+1):
  if x%i == 0:
    res.append(i)
for j in res:
  y = x/j
  res2.append (y)
for k in res2:
  res.append(k)
```

```
res.append(1)
res.append(x)
res.sort(key=int)
# print (res)

res3 = res[::-1]
for l in res3:
  counter = 0
  for m in range (2,int(l ** 0.5)+1):
    if l%m == 0:
      counter += 1
  if counter == 0:
    print (l)
    break
```
#4----------

A palindromic number reads the same both ways. The largest palindrome made from the product of two 2-digit numbers is 9009 = 91 × 99. Find the largest palindrome made from the product of two 3-digit numbers.

```
for i in range (1000,100,-1):
  for j in range (1000,100,-1):
        x = str(i*j)
        if int(x[0]) == int(x[5]):
            if int(x[1]) == int(x[4]):
                if int(x[2]) == int(x[3]):
print (x)
```
#5----------

2520 is the smallest number that can be divided by each of the numbers from 1 to 10 without any remainder. What is the smallest positive number that is evenly divisible by all of the numbers from 1 to 20?

```
a = 20
x = True
while x:
  counter = 0
  for i in range (1,21):
          if a%i == 0:
          counter += 1
  if counter == 20:
```

```
        print (a)
        x = False
  else:
        a += 20
```
#6----------
The sum of the squares of the first ten natural numbers is, 1^2 + 2^2 + ... + 10^2 = 385. The square of the sum of the first ten natural numbers is, (1 + 2 + ... + 10)^2 = 552 = 3025. Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is 3025 − 385 = 2640. Find the difference between the sum of the squares of the first one hundred natural numbers and the square of the sum.

```
sum_of_squares = 0
total = 0
for i in range(1,101):
    if i>0:
        sum_of_squares += i ** 2
        total += i
total_squared = total * total
difference = total_squared - sum_of_squares
print (difference)
```
#7----------
By listing the first six prime numbers: 2, 3, 5, 7, 11, and 13, we can see that the 6th prime is 13. What is the 10 001st prime number?

```
x = 2
primes = []
while len(primes) < 100001:
  counter = 1
  for i in range(1,int(x**.5)+1):
    if x%i == 0:
      counter += 1
  if counter == 2:
    primes.append(x)
  x += 1
print (primes[10000])
```
#9----------
A Pythagorean triplet is a set of three natural numbers, a < b < c, for which, a^2 + b^2 = c^2 For example, 32 + 42 = 9 + 16 = 25 = 52. There exists exactly one Pythagorean triplet for which a + b + c = 1000. Find the product abc.

```
for a in range (1001):
  for b in range (1001):
    for c in range (1001):
      if a < b and b < c and c**2 == a**2 + b**2 and a + b + c == 1000:
        print (a, b, c)
        print (a*b*c)
        break
```

#10----------

The sum of the primes below 10 is 2 + 3 + 5 + 7 = 17. Find the sum of all the primes below two million.

```
x = 2
primes = []
sum_primes = 0
while x < 2000000:
  counter = 1
  for i in range(1,int(x**.5)+1):
    if x%i == 0:
      counter += 1
  if counter == 2:
    primes.append(x)
  x += 1
for k in primes:
  sum_primes += k
print (sum_primes)
```

#12----------

The sequence of triangle numbers is generated by adding the natural numbers. So the 7th triangle number would be 1 + 2 + 3 + 4 + 5 + 6 + 7 = 28. The first ten terms would be: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, … Let us list the factors of the first seven triangle numbers:

```
 1: 1
 3: 1,3
 6: 1,2,3,6
10: 1,2,5,10
15: 1,3,5,15
21: 1,3,7,21
28: 1,2,4,7,14,28
```

We can see that 28 is the first triangle number to have over five divisors. What is the value of the first triangle number to have over five hundred divisors?

```
i = 1
counter = 0
res = []
while counter < 100000000:
  i += 1
  counter = 0
  for j in range (1,i):
    counter += j
  res.append(counter)
for k in res:
  set1 = []
  set2 = []
  for x in range (2,int(k ** 0.5)+1):
    if k%x == 0:
      set1.append(x)
  for y in set1:
    d = k/y
    set2.append(d)
  for l in set2:
    set1.append(l)
  set1.append(1)
  set1.append(k)
  set1.sort(key = int)
  if len(set1) > 500:
    print (k)
    break
```

#13----------

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
59959406895756536782107074926966537676326235447210
69793950679652694742597709739166693763042633987085
41052684708299085211399427365734116182760315001271
65378607361501080857009149939512557028198746004375
35829035317434717326932123578154982629742552737307
94953759765105305946966067683156574377167401875275
88902802571733229619176668713819931811048770190271
25267680276078003013678680992525463401061632866526
36270218540497705585629946580636237993140746255962
24074486908231174977792365466257246923322810917141
91430288197103288597806669760892938638285025333403
34413065578016127815921815005561868836468420090470
23053081172816430487623791969842487255036638784583
11487696932154902810424020138335124462181441773470
63783299490636259666498587618221225225512486764533
67720186971698544312419572409913959008952310058822

95548255300263520781532296796249481641953868218774
76085327132285723110424803456124867697064507995236
37774242535411291684276865538926205024910326572967
23701913275725675285653248258265463092207058596522
29798860272258331913126375147341994889534765745501
18495701454879288984856827726077713721403798879715
38298203783031473527721580348144513491373226651381
34829543829199918180278916522431027392251122869539
40957953066405232632538044100059654939159879593635
29746152185502371307642255121183693803580388584903
41698116222072977186158236678424689157993532961922
62467957194401269043877107275048102390895523597457
23189706772547915061505504953922979530901129967519
86188088225875314529584099251203829009407770775672
11306739708304724483816533873502340845647058077308
82959174767140363198008187129011875491310547126581
97623331044818386269515456334926366572897563400500
42846280183517070527831839425882145521227251250327
55121603546981200581762165212827652751691296897789
32238195734329339946437501907836945765883352399886
75506164965184775180738168837861091527357929701337
62177842752192623401942399639168044983993173312731
32924185707147349566916674687634660915035914677504
99518671430235219628894890102423325116913619626622
73267460800591547471830798392868535206946944540724
76841822524674417161514036427982273348055556214818
97142617910342598647204516893989422179826088076852
87783646182799346313767754307809363333018982642090
10848802521674670883215120185883543223812876952786
71329612474782464538636993009049310363619763878039
62184073572399794223406235393808339651327408011116
66627891981488087797941876876144230030984490851411
60661826293682836764744779239180335110989069790714
85786944089552990653640447425576083659976645795096
66024396409905389607120198219976047599490197230297
64913982680032973156037120041377903785566085089252
16730939319872750275468906903707539413042652315011
94809377245048795150954100921645863754710598436791
78639167021187492431995700641917969777599028300699

```
153687137119366149528113058763802784107544497330784078992311553556256114232242325503368544248891735344889911501440648020369068063960672322193204149535415031288803395360532993403680069777106505666319548123488067321014673905856855793458140362782270328082616570773948327592232845941706525094512325230608229188020587773197198394501808880724296619808111977715854250201654509041324580978688277894872185961772107838435069186155435662884062257473692284509516208496039801340017239306716668235552452528046097225353034226472524250874054075591789781264330331690
```

```
myfile = open('largesum.txt', 'r')
largesum = 0
for line in myfile:
        largesum += int(line)
print (largesum)

largesum2 = str(largesum)
print (largesum2[:10])
```

#14----------

The following iterative sequence is defined for the set of positive integers: n → n/2 (n is even) and n → 3n + 1 (n is odd).Using the rule above and starting with 13, we generate the following sequence: 13 → 40 → 20 → 10 → 5 → 16 → 8 → 4 → 2 → 1 It can be seen that this sequence (starting at 13 and finishing at 1) contains 10 terms. Although it has not been proved yet (Collatz Problem), it is thought that all starting numbers finish at 1. Which starting number, under one million, produces the longest chain? NOTE: Once the chain starts the terms are allowed to go above one million.

```
res = []
for x in range(1,1000001):
  counter = 1
  while x != 1:
        counter += 1
        if x%2 == 0:
        x = x/2
        else:
        x = 3*x + 1
  res.append(counter)
```

```
res2 = sorted(res)
largest = res2[-1]
print (res.index(largest)+1)
```

#16----------

215 = 32768 and the sum of its digits is 3 + 2 + 7 + 6 + 8 = 26. What is the sum of the digits of the number 21000?

```
x = str(2 ** 1000)
total = 0
for i in (x):
  j = int(i)
  total += j
print (total)
```

#20----------

n! means n × (n − 1) × ... × 3 × 2 × 1. For example, 10! = 10 × 9 × ... × 3 × 2 × 1 = 3628800, and the sum of the digits in the number 10! is 3 + 6 + 2 + 8 + 8 + 0 + 0 = 27. Find the sum of the digits in the number 100!

```
x = 100
y = 1

for i in range (x,1,-1):
  y = y * i
z = str(y)
total = 0
for j in z:
  k = int(j)
  total += k
print (total)
```

#21----------

Let d(n) be defined as the sum of proper divisors of n (numbers less than n which divide evenly into n). If d(a) = b and d(b) = a, where a ≠ b, then a and b are an amicable pair and each of a and b are called amicable numbers. For example, the proper divisors of 220 are 1, 2, 4, 5, 10, 11, 20, 22, 44, 55 and 110; therefore d(220) = 284. The proper divisors of 284 are 1, 2, 4, 71 and 142; so d(284) = 220. Evaluate the sum of all the amicable numbers under 10000.

```
def sumproperdivisors(x):
        res = []
```

```
        total = 0
        for i in range (1,int(x/2)+1):
        if x%i == 0:
        res.append(i)
        for j in res:
        total +=j
        return total
answers = []
for xx in range(1,10000):
        first = sumproperdivisors(xx)
        second = sumproperdivisors(first)
        if xx == second and xx != first:
        answers.append(xx)
print (answers)
answersanswers = 0
for yy in answers:
        answersanswers += yy
print (answersanswers)
#22----------
```

Using names.txt (right click and 'Save Link/Target As...'), a 46K text file containing over five-thousand first names, begin by sorting it into alphabetical order. Then working out the alphabetical value for each name, multiply this value by its alphabetical position in the list to obtain a name score. For example, when the list is sorted into alphabetical order, COLIN, which is worth 3 + 15 + 12 + 9 + 14 = 53, is the 938th name in the list. So, COLIN would obtain a score of 938 × 53 = 49714. What is the total of all the name scores in the file?

```
names =
["MARY","PATRICIA","LINDA","BARBARA","ELIZABETH","JENNIFER","MARIA","SU
SAN","MARGARET","DOROTHY","LISA","NANCY","KAREN","BETTY","HELEN","SAN
DRA","DONNA","CAROL","RUTH","SHARON","MICHELLE","LAURA","SARAH","KIMB
ERLY","DEBORAH","JESSICA","SHIRLEY","CYNTHIA","ANGELA","MELISSA","BREN
DA","AMY","ANNA","REBECCA","VIRGINIA","KATHLEEN","PAMELA","MARTHA","D
EBRA","AMANDA","STEPHANIE","CAROLYN","CHRISTINE","MARIE","JANET","CAT
HERINE","FRANCES","ANN","JOYCE","DIANE","ALICE","JULIE","HEATHER","TERES
A","DORIS","GLORIA","EVELYN","JEAN","CHERYL","MILDRED","KATHERINE","JOA
N","ASHLEY","JUDITH","ROSE","JANICE","KELLY","NICOLE","JUDY","CHRISTINA","
KATHY","THERESA","BEVERLY","DENISE","TAMMY","IRENE","JANE","LORI","RAC
HEL","MARILYN","ANDREA","KATHRYN","LOUISE","SARA","ANNE","JACQUELINE",
"WANDA","BONNIE","JULIA","RUBY","LOIS","TINA","PHYLLIS","NORMA","PAULA","
```

DIANA","ANNIE","LILLIAN","EMILY","ROBIN","PEGGY","CRYSTAL","GLADYS","RIT
A","DAWN","CONNIE","FLORENCE","TRACY","EDNA","TIFFANY","CARMEN","ROSA
","CINDY","GRACE","WENDY","VICTORIA","EDITH","KIM","SHERRY","SYLVIA","JOS
EPHINE","THELMA","SHANNON","SHEILA","ETHEL","ELLEN","ELAINE","MARJORIE"
,"CARRIE","CHARLOTTE","MONICA","ESTHER","PAULINE","EMMA","JUANITA","ANI
TA","RHONDA","HAZEL","AMBER","EVA","DEBBIE","APRIL","LESLIE","CLARA","LU
CILLE","JAMIE","JOANNE","ELEANOR","VALERIE","DANIELLE","MEGAN","ALICIA",
"SUZANNE","MICHELE","GAIL","BERTHA","DARLENE","VERONICA","JILL","ERIN","
GERALDINE","LAUREN","CATHY","JOANN","LORRAINE","LYNN","SALLY","REGINA
","ERICA","BEATRICE","DOLORES","BERNICE","AUDREY","YVONNE","ANNETTE","J
UNE","SAMANTHA","MARION","DANA","STACY","ANA","RENEE","IDA","VIVIAN","R
OBERTA","HOLLY","BRITTANY","MELANIE","LORETTA","YOLANDA","JEANETTE","
LAURIE","KATIE","KRISTEN","VANESSA","ALMA","SUE","ELSIE","BETH","JEANNE",
"VICKI","CARLA","TARA","ROSEMARY","EILEEN","TERRI","GERTRUDE","LUCY","T
ONYA","ELLA","STACEY","WILMA","GINA","KRISTIN","JESSIE","NATALIE","AGNES"
,"VERA","WILLIE","CHARLENE","BESSIE","DELORES","MELINDA","PEARL","ARLEN
E","MAUREEN","COLLEEN","ALLISON","TAMARA","JOY","GEORGIA","CONSTANCE"
,"LILLIE","CLAUDIA","JACKIE","MARCIA","TANYA","NELLIE","MINNIE","MARLENE
","HEIDI","GLENDA","LYDIA","VIOLA","COURTNEY","MARIAN","STELLA","CAROLI
NE","DORA","JO","VICKIE","MATTIE","TERRY","MAXINE","IRMA","MABEL","MARSH
A","MYRTLE","LENA","CHRISTY","DEANNA","PATSY","HILDA","GWENDOLYN","JE
NNIE","NORA","MARGIE","NINA","CASSANDRA","LEAH","PENNY","KAY","PRISCILL
A","NAOMI","CAROLE","BRANDY","OLGA","BILLIE","DIANNE","TRACEY","LEONA",
"JENNY","FELICIA","SONIA","MIRIAM","VELMA","BECKY","BOBBIE","VIOLET","KRI
STINA","TONI","MISTY","MAE","SHELLY","DAISY","RAMONA","SHERRI","ERIKA","K
ATRINA","CLAIRE","LINDSEY","LINDSAY","GENEVA","GUADALUPE","BELINDA","
MARGARITA","SHERYL","CORA","FAYE","ADA","NATASHA","SABRINA","ISABEL","
MARGUERITE","HATTIE","HARRIET","MOLLY","CECILIA","KRISTI","BRANDI","BLA
NCHE","SANDY","ROSIE","JOANNA","IRIS","EUNICE","ANGIE","INEZ","LYNDA","MA
DELINE","AMELIA","ALBERTA","GENEVIEVE","MONIQUE","JODI","JANIE","MAGGIE
","KAYLA","SONYA","JAN","LEE","KRISTINE","CANDACE","FANNIE","MARYANN","
OPAL","ALISON","YVETTE","MELODY","LUZ","SUSIE","OLIVIA","FLORA","SHELLEY
","KRISTY","MAMIE","LULA","LOLA","VERNA","BEULAH","ANTOINETTE","CANDIC
E","JUANA","JEANNETTE","PAM","KELLI","HANNAH","WHITNEY","BRIDGET","KAR
LA","CELIA","LATOYA","PATTY","SHELIA","GAYLE","DELLA","VICKY","LYNNE","S
HERI","MARIANNE","KARA","JACQUELYN","ERMA","BLANCA","MYRA","LETICIA","
PAT","KRISTA","ROXANNE","ANGELICA","JOHNNIE","ROBYN","FRANCIS","ADRIEN
NE","ROSALIE","ALEXANDRA","BROOKE","BETHANY","SADIE","BERNADETTE","TR
ACI","JODY","KENDRA","JASMINE","NICHOLE","RACHAEL","CHELSEA","MABLE","E

RNESTINE","MURIEL","MARCELLA","ELENA","KRYSTAL","ANGELINA","NADINE","
KARI","ESTELLE","DIANNA","PAULETTE","LORA","MONA","DOREEN","ROSEMARIE
","ANGEL","DESIREE","ANTONIA","HOPE","GINGER","JANIS","BETSY","CHRISTIE","F
REDA","MERCEDES","MEREDITH","LYNETTE","TERI","CRISTINA","EULA","LEIGH","
MEGHAN","SOPHIA","ELOISE","ROCHELLE","GRETCHEN","CECELIA","RAQUEL","H
ENRIETTA","ALYSSA","JANA","KELLEY","GWEN","KERRY","JENNA","TRICIA","LAV
ERNE","OLIVE","ALEXIS","TASHA","SILVIA","ELVIRA","CASEY","DELIA","SOPHIE","
KATE","PATTI","LORENA","KELLIE","SONJA","LILA","LANA","DARLA","MAY","MIN
DY","ESSIE","MANDY","LORENE","ELSA","JOSEFINA","JEANNIE","MIRANDA","DIXI
E","LUCIA","MARTA","FAITH","LELA","JOHANNA","SHARI","CAMILLE","TAMI","SH
AWNA","ELISA","EBONY","MELBA","ORA","NETTIE","TABITHA","OLLIE","JAIME","
WINIFRED","KRISTIE","MARINA","ALISHA","AIMEE","RENA","MYRNA","MARLA","T
AMMIE","LATASHA","BONITA","PATRICE","RONDA","SHERRIE","ADDIE","FRANCIN
E","DELORIS","STACIE","ADRIANA","CHERI","SHELBY","ABIGAIL","CELESTE","JEW
EL","CARA","ADELE","REBEKAH","LUCINDA","DORTHY","CHRIS","EFFIE","TRINA","
REBA","SHAWN","SALLIE","AURORA","LENORA","ETTA","LOTTIE","KERRI","TRISH
A","NIKKI","ESTELLA","FRANCISCA","JOSIE","TRACIE","MARISSA","KARIN","BRITT
NEY","JANELLE","LOURDES","LAUREL","HELENE","FERN","ELVA","CORINNE","KEL
SEY","INA","BETTIE","ELISABETH","AIDA","CAITLIN","INGRID","IVA","EUGENIA","
CHRISTA","GOLDIE","CASSIE","MAUDE","JENIFER","THERESE","FRANKIE","DENA",
"LORNA","JANETTE","LATONYA","CANDY","MORGAN","CONSUELO","TAMIKA","R
OSETTA","DEBORA","CHERIE","POLLY","DINA","JEWELL","FAY","JILLIAN","DOROT
HEA","NELL","TRUDY","ESPERANZA","PATRICA","KIMBERLEY","SHANNA","HELEN
A","CAROLINA","CLEO","STEFANIE","ROSARIO","OLA","JANINE","MOLLIE","LUPE",
"ALISA","LOU","MARIBEL","SUSANNE","BETTE","SUSANA","ELISE","CECILE","ISAB
ELLE","LESLEY","JOCELYN","PAIGE","JONI","RACHELLE","LEOLA","DAPHNE","ALT
A","ESTER","PETRA","GRACIELA","IMOGENE","JOLENE","KEISHA","LACEY","GLEN
NA","GABRIELA","KERI","URSULA","LIZZIE","KIRSTEN","SHANA","ADELINE","MAY
RA","JAYNE","JACLYN","GRACIE","SONDRA","CARMELA","MARISA","ROSALIND","
CHARITY","TONIA","BEATRIZ","MARISOL","CLARICE","JEANINE","SHEENA","ANGE
LINE","FRIEDA","LILY","ROBBIE","SHAUNA","MILLIE","CLAUDETTE","CATHLEEN",
"ANGELIA","GABRIELLE","AUTUMN","KATHARINE","SUMMER","JODIE","STACI","L
EA","CHRISTI","JIMMIE","JUSTINE","ELMA","LUELLA","MARGRET","DOMINIQUE","
SOCORRO","RENE","MARTINA","MARGO","MAVIS","CALLIE","BOBBI","MARITZA","
LUCILE","LEANNE","JEANNINE","DEANA","AILEEN","LORIE","LADONNA","WILLA",
"MANUELA","GALE","SELMA","DOLLY","SYBIL","ABBY","LARA","DALE","IVY","DE
E","WINNIE","MARCY","LUISA","JERI","MAGDALENA","OFELIA","MEAGAN","AUDR
A","MATILDA","LEILA","CORNELIA","BIANCA","SIMONE","BETTYE","RANDI","VIRG
IE","LATISHA","BARBRA","GEORGINA","ELIZA","LEANN","BRIDGETTE","RHODA","

HALEY","ADELA","NOLA","BERNADINE","FLOSSIE","ILA","GRETA","RUTHIE","NEL
DA","MINERVA","LILLY","TERRIE","LETHA","HILARY","ESTELA","VALARIE","BRIA
NNA","ROSALYN","EARLINE","CATALINA","AVA","MIA","CLARISSA","LIDIA","COR
RINE","ALEXANDRIA","CONCEPCION","TIA","SHARRON","RAE","DONA","ERICKA","
JAMI","ELNORA","CHANDRA","LENORE","NEVA","MARYLOU","MELISA","TABATH
A","SERENA","AVIS","ALLIE","SOFIA","JEANIE","ODESSA","NANNIE","HARRIETT","L
ORAINE","PENELOPE","MILAGROS","EMILIA","BENITA","ALLYSON","ASHLEE","TA
NIA","TOMMIE","ESMERALDA","KARINA","EVE","PEARLIE","ZELMA","MALINDA","
NOREEN","TAMEKA","SAUNDRA","HILLARY","AMIE","ALTHEA","ROSALINDA","JO
RDAN","LILIA","ALANA","GAY","CLARE","ALEJANDRA","ELINOR","MICHAEL","LO
RRIE","JERRI","DARCY","EARNESTINE","CARMELLA","TAYLOR","NOEMI","MARCIE
","LIZA","ANNABELLE","LOUISA","EARLENE","MALLORY","CARLENE","NITA","SEL
ENA","TANISHA","KATY","JULIANNE","JOHN","LAKISHA","EDWINA","MARICELA","
MARGERY","KENYA","DOLLIE","ROXIE","ROSLYN","KATHRINE","NANETTE","CHA
RMAINE","LAVONNE","ILENE","KRIS","TAMMI","SUZETTE","CORINE","KAYE","JER
RY","MERLE","CHRYSTAL","LINA","DEANNE","LILIAN","JULIANA","ALINE","LUAN
N","KASEY","MARYANNE","EVANGELINE","COLETTE","MELVA","LAWANDA","YES
ENIA","NADIA","MADGE","KATHIE","EDDIE","OPHELIA","VALERIA","NONA","MITZI
","MARI","GEORGETTE","CLAUDINE","FRAN","ALISSA","ROSEANN","LAKEISHA","S
USANNA","REVA","DEIDRE","CHASITY","SHEREE","CARLY","JAMES","ELVIA","ALY
CE","DEIRDRE","GENA","BRIANA","ARACELI","KATELYN","ROSANNE","WENDI","T
ESSA","BERTA","MARVA","IMELDA","MARIETTA","MARCI","LEONOR","ARLINE","S
ASHA","MADELYN","JANNA","JULIETTE","DEENA","AURELIA","JOSEFA","AUGUST
A","LILIANA","YOUNG","CHRISTIAN","LESSIE","AMALIA","SAVANNAH","ANASTAS
IA","VILMA","NATALIA","ROSELLA","LYNNETTE","CORINA","ALFREDA","LEANNA"
,"CAREY","AMPARO","COLEEN","TAMRA","AISHA","WILDA","KARYN","CHERRY","
QUEEN","MAURA","MAI","EVANGELINA","ROSANNA","HALLIE","ERNA","ENID","M
ARIANA","LACY","JULIET","JACKLYN","FREIDA","MADELEINE","MARA","HESTER",
"CATHRYN","LELIA","CASANDRA","BRIDGETT","ANGELITA","JANNIE","DIONNE","
ANNMARIE","KATINA","BERYL","PHOEBE","MILLICENT","KATHERYN","DIANN","C
ARISSA","MARYELLEN","LIZ","LAURI","HELGA","GILDA","ADRIAN","RHEA","MARQ
UITA","HOLLIE","TISHA","TAMERA","ANGELIQUE","FRANCESCA","BRITNEY","KAI
TLIN","LOLITA","FLORINE","ROWENA","REYNA","TWILA","FANNY","JANELL","INE
S","CONCETTA","BERTIE","ALBA","BRIGITTE","ALYSON","VONDA","PANSY","ELBA
","NOELLE","LETITIA","KITTY","DEANN","BRANDIE","LOUELLA","LETA","FELECIA"
,"SHARLENE","LESA","BEVERLEY","ROBERT","ISABELLA","HERMINIA","TERRA","C
ELINA","TORI","OCTAVIA","JADE","DENICE","GERMAINE","SIERRA","MICHELL","C
ORTNEY","NELLY","DORETHA","SYDNEY","DEIDRA","MONIKA","LASHONDA","JUD
I","CHELSEY","ANTIONETTE","MARGOT","BOBBY","ADELAIDE","NAN","LEEANN","

ELISHA","DESSIE","LIBBY","KATHI","GAYLA","LATANYA","MINA","MELLISA","KIM
BERLEE","JASMIN","RENAE","ZELDA","ELDA","MA","JUSTINA","GUSSIE","EMILIE","
CAMILLA","ABBIE","ROCIO","KAITLYN","JESSE","EDYTHE","ASHLEIGH","SELINA","
LAKESHA","GERI","ALLENE","PAMALA","MICHAELA","DAYNA","CARYN","ROSALI
A","SUN","JACQULINE","REBECA","MARYBETH","KRYSTLE","IOLA","DOTTIE","BEN
NIE","BELLE","AUBREY","GRISELDA","ERNESTINA","ELIDA","ADRIANNE","DEMET
RIA","DELMA","CHONG","JAQUELINE","DESTINY","ARLEEN","VIRGINA","RETHA","
FATIMA","TILLIE","ELEANORE","CARI","TREVA","BIRDIE","WILHELMINA","ROSAL
EE","MAURINE","LATRICE","YONG","JENA","TARYN","ELIA","DEBBY","MAUDIE","J
EANNA","DELILAH","CATRINA","SHONDA","HORTENCIA","THEODORA","TERESITA
","ROBBIN","DANETTE","MARYJANE","FREDDIE","DELPHINE","BRIANNE","NILDA",
"DANNA","CINDI","BESS","IONA","HANNA","ARIEL","WINONA","VIDA","ROSITA","
MARIANNA","WILLIAM","RACHEAL","GUILLERMINA","ELOISA","CELESTINE","CAR
EN","MALISSA","LONA","CHANTEL","SHELLIE","MARISELA","LEORA","AGATHA","S
OLEDAD","MIGDALIA","IVETTE","CHRISTEN","ATHENA","JANEL","CHLOE","VEDA",
"PATTIE","TESSIE","TERA","MARILYNN","LUCRETIA","KARRIE","DINAH","DANIELA
","ALECIA","ADELINA","VERNICE","SHIELA","PORTIA","MERRY","LASHAWN","DEV
ON","DARA","TAWANA","OMA","VERDA","CHRISTIN","ALENE","ZELLA","SANDI","R
AFAELA","MAYA","KIRA","CANDIDA","ALVINA","SUZAN","SHAYLA","LYN","LETTI
E","ALVA","SAMATHA","ORALIA","MATILDE","MADONNA","LARISSA","VESTA","R
ENITA","INDIA","DELOIS","SHANDA","PHILLIS","LORRI","ERLINDA","CRUZ","CATH
RINE","BARB","ZOE","ISABELL","IONE","GISELA","CHARLIE","VALENCIA","ROXAN
NA","MAYME","KISHA","ELLIE","MELLISSA","DORRIS","DALIA","BELLA","ANNETT
A","ZOILA","RETA","REINA","LAURETTA","KYLIE","CHRISTAL","PILAR","CHARLA",
"ELISSA","TIFFANI","TANA","PAULINA","LEOTA","BREANNA","JAYME","CARMEL","
VERNELL","TOMASA","MANDI","DOMINGA","SANTA","MELODIE","LURA","ALEXA"
,"TAMELA","RYAN","MIRNA","KERRIE","VENUS","NOEL","FELICITA","CRISTY","CA
RMELITA","BERNIECE","ANNEMARIE","TIARA","ROSEANNE","MISSY","CORI","ROX
ANA","PRICILLA","KRISTAL","JUNG","ELYSE","HAYDEE","ALETHA","BETTINA","M
ARGE","GILLIAN","FILOMENA","CHARLES","ZENAIDA","HARRIETTE","CARIDAD","
VADA","UNA","ARETHA","PEARLINE","MARJORY","MARCELA","FLOR","EVETTE","
ELOUISE","ALINA","TRINIDAD","DAVID","DAMARIS","CATHARINE","CARROLL","B
ELVA","NAKIA","MARLENA","LUANNE","LORINE","KARON","DORENE","DANITA","
BRENNA","TATIANA","SAMMIE","LOUANN","LOREN","JULIANNA","ANDRIA","PHIL
OMENA","LUCILA","LEONORA","DOVIE","ROMONA","MIMI","JACQUELIN","GAYE","
TONJA","MISTI","JOE","GENE","CHASTITY","STACIA","ROXANN","MICAELA","NIKIT
A","MEI","VELDA","MARLYS","JOHNNA","AURA","LAVERN","IVONNE","HAYLEY","
NICKI","MAJORIE","HERLINDA","GEORGE","ALPHA","YADIRA","PERLA","GREGORI
A","DANIEL","ANTONETTE","SHELLI","MOZELLE","MARIAH","JOELLE","CORDELIA

","JOSETTE","CHIQUITA","TRISTA","LOUIS","LAQUITA","GEORGIANA","CANDI","SH
ANON","LONNIE","HILDEGARD","CECIL","VALENTINA","STEPHANY","MAGDA","K
AROL","GERRY","GABRIELLA","TIANA","ROMA","RICHELLE","RAY","PRINCESS","O
LETA","JACQUE","IDELLA","ALAINA","SUZANNA","JOVITA","BLAIR","TOSHA","RA
VEN","NEREIDA","MARLYN","KYLA","JOSEPH","DELFINA","TENA","STEPHENIE","S
ABINA","NATHALIE","MARCELLE","GERTIE","DARLEEN","THEA","SHARONDA","SH
ANTEL","BELEN","VENESSA","ROSALINA","ONA","GENOVEVA","COREY","CLEMEN
TINE","ROSALBA","RENATE","RENATA","MI","IVORY","GEORGIANNA","FLOY","DO
RCAS","ARIANA","TYRA","THEDA","MARIAM","JULI","JESICA","DONNIE","VIKKI","
VERLA","ROSELYN","MELVINA","JANNETTE","GINNY","DEBRAH","CORRIE","ASIA"
,"VIOLETA","MYRTIS","LATRICIA","COLLETTE","CHARLEEN","ANISSA","VIVIANA",
"TWYLA","PRECIOUS","NEDRA","LATONIA","LAN","HELLEN","FABIOLA","ANNAMA
RIE","ADELL","SHARYN","CHANTAL","NIKI","MAUD","LIZETTE","LINDY","KIA","KE
SHA","JEANA","DANELLE","CHARLINE","CHANEL","CARROL","VALORIE","LIA","DO
RTHA","CRISTAL","SUNNY","LEONE","LEILANI","GERRI","DEBI","ANDRA","KESHIA
","IMA","EULALIA","EASTER","DULCE","NATIVIDAD","LINNIE","KAMI","GEORGIE","
CATINA","BROOK","ALDA","WINNIFRED","SHARLA","RUTHANN","MEAGHAN","MA
GDALENE","LISSETTE","ADELAIDA","VENITA","TRENA","SHIRLENE","SHAMEKA","
ELIZEBETH","DIAN","SHANTA","MICKEY","LATOSHA","CARLOTTA","WINDY","SOO
N","ROSINA","MARIANN","LEISA","JONNIE","DAWNA","CATHIE","BILLY","ASTRID",
"SIDNEY","LAUREEN","JANEEN","HOLLI","FAWN","VICKEY","TERESSA","SHANTE",
"RUBYE","MARCELINA","CHANDA","CARY","TERESE","SCARLETT","MARTY","MAR
NIE","LULU","LISETTE","JENIFFER","ELENOR","DORINDA","DONITA","CARMAN","B
ERNITA","ALTAGRACIA","ALETA","ADRIANNA","ZORAIDA","RONNIE","NICOLA","L
YNDSEY","KENDALL","JANINA","CHRISSY","AMI","STARLA","PHYLIS","PHUONG","
KYRA","CHARISSE","BLANCH","SANJUANITA","RONA","NANCI","MARILEE","MARA
NDA","CORY","BRIGETTE","SANJUANA","MARITA","KASSANDRA","JOYCELYN","IR
A","FELIPA","CHELSIE","BONNY","MIREYA","LORENZA","KYONG","ILEANA","CAN
DELARIA","TONY","TOBY","SHERIE","OK","MARK","LUCIE","LEATRICE","LAKESHI
A","GERDA","EDIE","BAMBI","MARYLIN","LAVON","HORTENSE","GARNET","EVIE",
"TRESSA","SHAYNA","LAVINA","KYUNG","JEANETTA","SHERRILL","SHARA","PHYL
ISS","MITTIE","ANABEL","ALESIA","THUY","TAWANDA","RICHARD","JOANIE","TIFF
ANIE","LASHANDA","KARISSA","ENRIQUETA","DARIA","DANIELLA","CORINNA","A
LANNA","ABBEY","ROXANE","ROSEANNA","MAGNOLIA","LIDA","KYLE","JOELLEN
","ERA","CORAL","CARLEEN","TRESA","PEGGIE","NOVELLA","NILA","MAYBELLE","
JENELLE","CARINA","NOVA","MELINA","MARQUERITE","MARGARETTE","JOSEPHI
NA","EVONNE","DEVIN","CINTHIA","ALBINA","TOYA","TAWNYA","SHERITA","SAN
TOS","MYRIAM","LIZABETH","LISE","KEELY","JENNI","GISELLE","CHERYLE","ARDI
TH","ARDIS","ALESHA","ADRIANE","SHAINA","LINNEA","KAROLYN","HONG","FLO

RIDA","FELISHA","DORI","DARCI","ARTIE","ARMIDA","ZOLA","XIOMARA","VERGIE
","SHAMIKA","NENA","NANNETTE","MAXIE","LOVIE","JEANE","JAIMIE","INGE","FA
RRAH","ELAINA","CAITLYN","STARR","FELICITAS","CHERLY","CARYL","YOLONDA
","YASMIN","TEENA","PRUDENCE","PENNIE","NYDIA","MACKENZIE","ORPHA","MA
RVEL","LIZBETH","LAURETTE","JERRIE","HERMELINDA","CAROLEE","TIERRA","MI
RIAN","META","MELONY","KORI","JENNETTE","JAMILA","ENA","ANH","YOSHIKO","
SUSANNAH","SALINA","RHIANNON","JOLEEN","CRISTINE","ASHTON","ARACELY","
TOMEKA","SHALONDA","MARTI","LACIE","KALA","JADA","ILSE","HAILEY","BRITT
ANI","ZONA","SYBLE","SHERRYL","RANDY","NIDIA","MARLO","KANDICE","KANDI"
,"DEB","DEAN","AMERICA","ALYCIA","TOMMY","RONNA","NORENE","MERCY","JO
SE","INGEBORG","GIOVANNA","GEMMA","CHRISTEL","AUDRY","ZORA","VITA","VA
N","TRISH","STEPHAINE","SHIRLEE","SHANIKA","MELONIE","MAZIE","JAZMIN","IN
GA","HOA","HETTIE","GERALYN","FONDA","ESTRELLA","ADELLA","SU","SARITA","
RINA","MILISSA","MARIBETH","GOLDA","EVON","ETHELYN","ENEDINA","CHERISE
","CHANA","VELVA","TAWANNA","SADE","MIRTA","LI","KARIE","JACINTA","ELNA"
,"DAVINA","CIERRA","ASHLIE","ALBERTHA","TANESHA","STEPHANI","NELLE","MI
NDI","LU","LORINDA","LARUE","FLORENE","DEMETRA","DEDRA","CIARA","CHANT
ELLE","ASHLY","SUZY","ROSALVA","NOELIA","LYDA","LEATHA","KRYSTYNA","KR
ISTAN","KARRI","DARLINE","DARCIE","CINDA","CHEYENNE","CHERRIE","AWILDA"
,"ALMEDA","ROLANDA","LANETTE","JERILYN","GISELE","EVALYN","CYNDI","CLE
TA","CARIN","ZINA","ZENA","VELIA","TANIKA","PAUL","CHARISSA","THOMAS","T
ALIA","MARGARETE","LAVONDA","KAYLEE","KATHLENE","JONNA","IRENA","ILO
NA","IDALIA","CANDIS","CANDANCE","BRANDEE","ANITRA","ALIDA","SIGRID","NI
COLETTE","MARYJO","LINETTE","HEDWIG","CHRISTIANA","CASSIDY","ALEXIA","T
RESSIE","MODESTA","LUPITA","LITA","GLADIS","EVELIA","DAVIDA","CHERRI","CE
CILY","ASHELY","ANNABEL","AGUSTINA","WANITA","SHIRLY","ROSAURA","HULD
A","EUN","BAILEY","YETTA","VERONA","THOMASINA","SIBYL","SHANNAN","MEC
HELLE","LUE","LEANDRA","LANI","KYLEE","KANDY","JOLYNN","FERNE","EBONI","
CORENE","ALYSIA","ZULA","NADA","MOIRA","LYNDSAY","LORRETTA","JUAN","JA
MMIE","HORTENSIA","GAYNELL","CAMERON","ADRIA","VINA","VICENTA","TANG
ELA","STEPHINE","NORINE","NELLA","LIANA","LESLEE","KIMBERELY","ILIANA","G
LORY","FELICA","EMOGENE","ELFRIEDE","EDEN","EARTHA","CARMA","BEA","OCI
E","MARRY","LENNIE","KIARA","JACALYN","CARLOTA","ARIELLE","YU","STAR","O
TILIA","KIRSTIN","KACEY","JOHNETTA","JOEY","JOETTA","JERALDINE","JAUNITA",
"ELANA","DORTHEA","CAMI","AMADA","ADELIA","VERNITA","TAMAR","SIOBHAN
","RENEA","RASHIDA","OUIDA","ODELL","NILSA","MERYL","KRISTYN","JULIETA","
DANICA","BREANNE","AUREA","ANGLEA","SHERRON","ODETTE","MALIA","LOREL
EI","LIN","LEESA","KENNA","KATHLYN","FIONA","CHARLETTE","SUZIE","SHANTEL
L","SABRA","RACQUEL","MYONG","MIRA","MARTINE","LUCIENNE","LAVADA","JU

LIANN","JOHNIE","ELVERA","DELPHIA","CLAIR","CHRISTIANE","CHAROLETTE","C
ARRI","AUGUSTINE","ASHA","ANGELLA","PAOLA","NINFA","LEDA","LAI","EDA","S
UNSHINE","STEFANI","SHANELL","PALMA","MACHELLE","LISSA","KECIA","KATHR
YNE","KARLENE","JULISSA","JETTIE","JENNIFFER","HUI","CORRINA","CHRISTOPHE
R","CAROLANN","ALENA","TESS","ROSARIA","MYRTICE","MARYLEE","LIANE","KE
NYATTA","JUDIE","JANEY","IN","ELMIRA","ELDORA","DENNA","CRISTI","CATHI","Z
AIDA","VONNIE","VIVA","VERNIE","ROSALINE","MARIELA","LUCIANA","LESLI","K
ARAN","FELICE","DENEEN","ADINA","WYNONA","TARSHA","SHERON","SHASTA","S
HANITA","SHANI","SHANDRA","RANDA","PINKIE","PARIS","NELIDA","MARILOU","L
YLA","LAURENE","LACI","JOI","JANENE","DOROTHA","DANIELE","DANI","CAROLY
NN","CARLYN","BERENICE","AYESHA","ANNELIESE","ALETHEA","THERSA","TAMI
KO","RUFINA","OLIVA","MOZELL","MARYLYN","MADISON","KRISTIAN","KATHYR
N","KASANDRA","KANDACE","JANAE","GABRIEL","DOMENICA","DEBBRA","DANNI
ELLE","CHUN","BUFFY","BARBIE","ARCELIA","AJA","ZENOBIA","SHAREN","SHARE
E","PATRICK","PAGE","MY","LAVINIA","KUM","KACIE","JACKELINE","HUONG","FE
LISA","EMELIA","ELEANORA","CYTHIA","CRISTIN","CLYDE","CLARIBEL","CARON",
"ANASTACIA","ZULMA","ZANDRA","YOKO","TENISHA","SUSANN","SHERILYN","SH
AY","SHAWANDA","SABINE","ROMANA","MATHILDA","LINSEY","KEIKO","JOANA",
"ISELA","GRETTA","GEORGETTA","EUGENIE","DUSTY","DESIRAE","DELORA","COR
AZON","ANTONINA","ANIKA","WILLENE","TRACEE","TAMATHA","REGAN","NICHE
LLE","MICKIE","MAEGAN","LUANA","LANITA","KELSIE","EDELMIRA","BREE","AFT
ON","TEODORA","TAMIE","SHENA","MEG","LINH","KELI","KACI","DANYELLE","BRI
TT","ARLETTE","ALBERTINE","ADELLE","TIFFINY","STORMY","SIMONA","NUMBER
S","NICOLASA","NICHOL","NIA","NAKISHA","MEE","MAIRA","LOREEN","KIZZY","JO
HNNY","JAY","FALLON","CHRISTENE","BOBBYE","ANTHONY","YING","VINCENZA",
"TANJA","RUBIE","RONI","QUEENIE","MARGARETT","KIMBERLI","IRMGARD","IDEL
L","HILMA","EVELINA","ESTA","EMILEE","DENNISE","DANIA","CARL","CARIE","AN
TONIO","WAI","SANG","RISA","RIKKI","PARTICIA","MUI","MASAKO","MARIO","LUV
ENIA","LOREE","LONI","LIEN","KEVIN","GIGI","FLORENCIA","DORIAN","DENITA","
DALLAS","CHI","BILLYE","ALEXANDER","TOMIKA","SHARITA","RANA","NIKOLE","
NEOMA","MARGARITE","MADALYN","LUCINA","LAILA","KALI","JENETTE","GABRI
ELE","EVELYNE","ELENORA","CLEMENTINA","ALEJANDRINA","ZULEMA","VIOLET
TE","VANNESSA","THRESA","RETTA","PIA","PATIENCE","NOELLA","NICKIE","JONE
LL","DELTA","CHUNG","CHAYA","CAMELIA","BETHEL","ANYA","ANDREW","THAN
H","SUZANN","SPRING","SHU","MILA","LILLA","LAVERNA","KEESHA","KATTIE","GI
A","GEORGENE","EVELINE","ESTELL","ELIZBETH","VIVIENNE","VALLIE","TRUDIE",
"STEPHANE","MICHEL","MAGALY","MADIE","KENYETTA","KARREN","JANETTA","
HERMINE","HARMONY","DRUCILLA","DEBBI","CELESTINA","CANDIE","BRITNI","B
ECKIE","AMINA","ZITA","YUN","YOLANDE","VIVIEN","VERNETTA","TRUDI","SOMM

ER","PEARLE","PATRINA","OSSIE","NICOLLE","LOYCE","LETTY","LARISA","KATHA
RINA","JOSELYN","JONELLE","JENELL","IESHA","HEIDE","FLORINDA","FLORENTIN
A","FLO","ELODIA","DORINE","BRUNILDA","BRIGID","ASHLI","ARDELLA","TWANA"
,"THU","TARAH","SUNG","SHEA","SHAVON","SHANE","SERINA","RAYNA","RAMONI
TA","NGA","MARGURITE","LUCRECIA","KOURTNEY","KATI","JESUS","JESENIA","DI
AMOND","CRISTA","AYANA","ALICA","ALIA","VINNIE","SUELLEN","ROMELIA","RA
CHELL","PIPER","OLYMPIA","MICHIKO","KATHALEEN","JOLIE","JESSI","JANESSA","
HANA","HA","ELEASE","CARLETTA","BRITANY","SHONA","SALOME","ROSAMOND"
,"REGENA","RAINA","NGOC","NELIA","LOUVENIA","LESIA","LATRINA","LATICIA","
LARHONDA","JINA","JACKI","HOLLIS","HOLLEY","EMMY","DEEANN","CORETTA","
ARNETTA","VELVET","THALIA","SHANICE","NETA","MIKKI","MICKI","LONNA","LE
ANA","LASHUNDA","KILEY","JOYE","JACQULYN","IGNACIA","HYUN","HIROKO","H
ENRY","HENRIETTE","ELAYNE","DELINDA","DARNELL","DAHLIA","COREEN","CON
SUELA","CONCHITA","CELINE","BABETTE","AYANNA","ANETTE","ALBERTINA","S
KYE","SHAWNEE","SHANEKA","QUIANA","PAMELIA","MIN","MERRI","MERLENE","
MARGIT","KIESHA","KIERA","KAYLENE","JODEE","JENISE","ERLENE","EMMIE","EL
SE","DARYL","DALILA","DAISEY","CODY","CASIE","BELIA","BABARA","VERSIE","V
ANESA","SHELBA","SHAWNDA","SAM","NORMAN","NIKIA","NAOMA","MARNA","M
ARGERET","MADALINE","LAWANA","KINDRA","JUTTA","JAZMINE","JANETT","HAN
NELORE","GLENDORA","GERTRUD","GARNETT","FREEDA","FREDERICA","FLORAN
CE","FLAVIA","DENNIS","CARLINE","BEVERLEE","ANJANETTE","VALDA","TRINITY
","TAMALA","STEVIE","SHONNA","SHA","SARINA","ONEIDA","MICAH","MERILYN","
MARLEEN","LURLINE","LENNA","KATHERIN","JIN","JENI","HAE","GRACIA","GLAD
Y","FARAH","ERIC","ENOLA","EMA","DOMINQUE","DEVONA","DELANA","CECILA","
CAPRICE","ALYSHA","ALI","ALETHIA","VENA","THERESIA","TAWNY","SONG","SHA
KIRA","SAMARA","SACHIKO","RACHELE","PAMELLA","NICKY","MARNI","MARIEL",
"MAREN","MALISA","LIGIA","LERA","LATORIA","LARAE","KIMBER","KATHERN","K
AREY","JENNEFER","JANETH","HALINA","FREDIA","DELISA","DEBROAH","CIERA","
CHIN","ANGELIKA","ANDREE","ALTHA","YEN","VIVAN","TERRESA","TANNA","SUK
","SUDIE","SOO","SIGNE","SALENA","RONNI","REBBECCA","MYRTIE","MCKENZIE","
MALIKA","MAIDA","LOAN","LEONARDA","KAYLEIGH","FRANCE","ETHYL","ELLYN
","DAYLE","CAMMIE","BRITTNI","BIRGIT","AVELINA","ASUNCION","ARIANNA","AK
IKO","VENICE","TYESHA","TONIE","TIESHA","TAKISHA","STEFFANIE","SINDY","SA
NTANA","MEGHANN","MANDA","MACIE","LADY","KELLYE","KELLEE","JOSLYN","J
ASON","INGER","INDIRA","GLINDA","GLENNIS","FERNANDA","FAUSTINA","ENEIDA
","ELICIA","DOT","DIGNA","DELL","ARLETTA","ANDRE","WILLIA","TAMMARA","TA
BETHA","SHERRELL","SARI","REFUGIO","REBBECA","PAULETTA","NIEVES","NATO
SHA","NAKITA","MAMMIE","KENISHA","KAZUKO","KASSIE","GARY","EARLEAN","
DAPHINE","CORLISS","CLOTILDE","CAROLYNE","BERNETTA","AUGUSTINA","AUD

REA","ANNIS","ANNABELL","YAN","TENNILLE","TAMICA","SELENE","SEAN","ROSA
NA","REGENIA","QIANA","MARKITA","MACY","LEEANNE","LAURINE","KYM","JESS
ENIA","JANITA","GEORGINE","GENIE","EMIKO","ELVIE","DEANDRA","DAGMAR","C
ORIE","COLLEN","CHERISH","ROMAINE","PORSHA","PEARLENE","MICHELINE","ME
RNA","MARGORIE","MARGARETTA","LORE","KENNETH","JENINE","HERMINA","FR
EDERICKA","ELKE","DRUSILLA","DORATHY","DIONE","DESIRE","CELENA","BRIGID
A","ANGELES","ALLEGRA","THEO","TAMEKIA","SYNTHIA","STEPHEN","SOOK","SL
YVIA","ROSANN","REATHA","RAYE","MARQUETTA","MARGART","LING","LAYLA","
KYMBERLY","KIANA","KAYLEEN","KATLYN","KARMEN","JOELLA","IRINA","EMEL
DA","ELENI","DETRA","CLEMMIE","CHERYLL","CHANTELL","CATHEY","ARNITA","
ARLA","ANGLE","ANGELIC","ALYSE","ZOFIA","THOMASINE","TENNIE","SON","SHE
RLY","SHERLEY","SHARYL","REMEDIOS","PETRINA","NICKOLE","MYUNG","MYRLE
","MOZELLA","LOUANNE","LISHA","LATIA","LANE","KRYSTA","JULIENNE","JOEL","
JEANENE","JACQUALINE","ISAURA","GWENDA","EARLEEN","DONALD","CLEOPAT
RA","CARLIE","AUDIE","ANTONIETTA","ALISE","ALEX","VERDELL","VAL","TYLER"
,"TOMOKO","THAO","TALISHA","STEVEN","SO","SHEMIKA","SHAUN","SCARLET","S
AVANNA","SANTINA","ROSIA","RAEANN","ODILIA","NANA","MINNA","MAGAN","L
YNELLE","LE","KARMA","JOEANN","IVANA","INELL","ILANA","HYE","HONEY","HE
E","GUDRUN","FRANK","DREAMA","CRISSY","CHANTE","CARMELINA","ARVILLA",
"ARTHUR","ANNAMAE","ALVERA","ALEIDA","AARON","YEE","YANIRA","VANDA","
TIANNA","TAM","STEFANIA","SHIRA","PERRY","NICOL","NANCIE","MONSERRATE",
"MINH","MELYNDA","MELANY","MATTHEW","LOVELLA","LAURE","KIRBY","KACY
","JACQUELYNN","HYON","GERTHA","FRANCISCO","ELIANA","CHRISTENA","CHRIS
TEEN","CHARISE","CATERINA","CARLEY","CANDYCE","ARLENA","AMMIE","YANG"
,"WILLETTE","VANITA","TUYET","TINY","SYREETA","SILVA","SCOTT","RONALD","P
ENNEY","NYLA","MICHAL","MAURICE","MARYAM","MARYA","MAGEN","LUDIE","L
OMA","LIVIA","LANELL","KIMBERLIE","JULEE","DONETTA","DIEDRA","DENISHA","
DEANE","DAWNE","CLARINE","CHERRYL","BRONWYN","BRANDON","ALLA","VAL
ERY","TONDA","SUEANN","SORAYA","SHOSHANA","SHELA","SHARLEEN","SHANEL
LE","NERISSA","MICHEAL","MERIDITH","MELLIE","MAYE","MAPLE","MAGARET","L
UIS","LILI","LEONILA","LEONIE","LEEANNA","LAVONIA","LAVERA","KRISTEL","KA
THEY","KATHE","JUSTIN","JULIAN","JIMMY","JANN","ILDA","HILDRED","HILDEGA
RDE","GENIA","FUMIKO","EVELIN","ERMELINDA","ELLY","DUNG","DOLORIS","DIO
NNA","DANAE","BERNEICE","ANNICE","ALIX","VERENA","VERDIE","TRISTAN","SH
AWNNA","SHAWANA","SHAUNNA","ROZELLA","RANDEE","RANAE","MILAGRO","L
YNELL","LUISE","LOUIE","LOIDA","LISBETH","KARLEEN","JUNITA","JONA","ISIS","
HYACINTH","HEDY","GWENN","ETHELENE","ERLINE","EDWARD","DONYA","DOMO
NIQUE","DELICIA","DANNETTE","CICELY","BRANDA","BLYTHE","BETHANN","ASH
LYN","ANNALEE","ALLINE","YUKO","VELLA","TRANG","TOWANDA","TESHA","SHE

RLYN","NARCISA","MIGUELINA","MERI","MAYBELL","MARLANA","MARGUERITA",
"MADLYN","LUNA","LORY","LORIANN","LIBERTY","LEONORE","LEIGHANN","LAU
RICE","LATESHA","LARONDA","KATRICE","KASIE","KARL","KALEY","JADWIGA","G
LENNIE","GEARLDINE","FRANCINA","EPIFANIA","DYAN","DORIE","DIEDRE","DENE
SE","DEMETRICE","DELENA","DARBY","CRISTIE","CLEORA","CATARINA","CARISA"
,"BERNIE","BARBERA","ALMETA","TRULA","TEREASA","SOLANGE","SHEILAH","SH
AVONNE","SANORA","ROCHELL","MATHILDE","MARGARETA","MAIA","LYNSEY","
LAWANNA","LAUNA","KENA","KEENA","KATIA","JAMEY","GLYNDA","GAYLENE","
ELVINA","ELANOR","DANUTA","DANIKA","CRISTEN","CORDIE","COLETTA","CLARI
TA","CARMON","BRYNN","AZUCENA","AUNDREA","ANGELE","YI","WALTER","VER
LIE","VERLENE","TAMESHA","SILVANA","SEBRINA","SAMIRA","REDA","RAYLENE"
,"PENNI","PANDORA","NORAH","NOMA","MIREILLE","MELISSIA","MARYALICE","L
ARAINE","KIMBERY","KARYL","KARINE","KAM","JOLANDA","JOHANA","JESUSA","
JALEESA","JAE","JACQUELYNE","IRISH","ILUMINADA","HILARIA","HANH","GENNI
E","FRANCIE","FLORETTA","EXIE","EDDA","DREMA","DELPHA","BEV","BARBAR","
ASSUNTA","ARDELL","ANNALISA","ALISIA","YUKIKO","YOLANDO","WONDA","WE
I","WALTRAUD","VETA","TEQUILA","TEMEKA","TAMEIKA","SHIRLEEN","SHENITA"
,"PIEDAD","OZELLA","MIRTHA","MARILU","KIMIKO","JULIANE","JENICE","JEN","JA
NAY","JACQUILINE","HILDE","FE","FAE","EVAN","EUGENE","ELOIS","ECHO","DEVO
RAH","CHAU","BRINDA","BETSEY","ARMINDA","ARACELIS","APRYL","ANNETT","A
LISHIA","VEOLA","USHA","TOSHIKO","THEOLA","TASHIA","TALITHA","SHERY","RU
DY","RENETTA","REIKO","RASHEEDA","OMEGA","OBDULIA","MIKA","MELAINE","
MEGGAN","MARTIN","MARLEN","MARGET","MARCELINE","MANA","MAGDALEN","
LIBRADA","LEZLIE","LEXIE","LATASHIA","LASANDRA","KELLE","ISIDRA","ISA","IN
OCENCIA","GWYN","FRANCOISE","ERMINIA","ERINN","DIMPLE","DEVORA","CRISE
LDA","ARMANDA","ARIE","ARIANE","ANGELO","ANGELENA","ALLEN","ALIZA","A
DRIENE","ADALINE","XOCHITL","TWANNA","TRAN","TOMIKO","TAMISHA","TAISH
A","SUSY","SIU","RUTHA","ROXY","RHONA","RAYMOND","OTHA","NORIKO","NATA
SHIA","MERRIE","MELVIN","MARINDA","MARIKO","MARGERT","LORIS","LIZZETTE
","LEISHA","KAILA","KA","JOANNIE","JERRICA","JENE","JANNET","JANEE","JACIND
A","HERTA","ELENORE","DORETTA","DELAINE","DANIELL","CLAUDIE","CHINA","B
RITTA","APOLONIA","AMBERLY","ALEASE","YURI","YUK","WEN","WANETA","UTE"
,"TOMI","SHARRI","SANDIE","ROSELLE","REYNALDA","RAGUEL","PHYLICIA","PAT
RIA","OLIMPIA","ODELIA","MITZIE","MITCHELL","MISS","MINDA","MIGNON","MIC
A","MENDY","MARIVEL","MAILE","LYNETTA","LAVETTE","LAURYN","LATRISHA","
LAKIESHA","KIERSTEN","KARY","JOSPHINE","JOLYN","JETTA","JANISE","JACQUIE"
,"IVELISSE","GLYNIS","GIANNA","GAYNELLE","EMERALD","DEMETRIUS","DANYEL
L","DANILLE","DACIA","CORALEE","CHER","CEOLA","BRETT","BELL","ARIANNE","
ALESHIA","YUNG","WILLIEMAE","TROY","TRINH","THORA","TAI","SVETLANA","SH

ERIKA","SHEMEKA","SHAUNDA","ROSELINE","RICKI","MELDA","MALLIE","LAVON
NA","LATINA","LARRY","LAQUANDA","LALA","LACHELLE","KLARA","KANDIS","JO
HNA","JEANMARIE","JAYE","HANG","GRAYCE","GERTUDE","EMERITA","EBONIE","
CLORINDA","CHING","CHERY","CAROLA","BREANN","BLOSSOM","BERNARDINE","
BECKI","ARLETHA","ARGELIA","ARA","ALITA","YULANDA","YON","YESSENIA","TO
BI","TASIA","SYLVIE","SHIRL","SHIRELY","SHERIDAN","SHELLA","SHANTELLE","S
ACHA","ROYCE","REBECKA","REAGAN","PROVIDENCIA","PAULENE","MISHA","MI
KI","MARLINE","MARICA","LORITA","LATOYIA","LASONYA","KERSTIN","KENDA","
KEITHA","KATHRIN","JAYMIE","JACK","GRICELDA","GINETTE","ERYN","ELINA","E
LFRIEDA","DANYEL","CHEREE","CHANELLE","BARRIE","AVERY","AURORE","ANN
AMARIA","ALLEEN","AILENE","AIDE","YASMINE","VASHTI","VALENTINE","TREAS
A","TORY","TIFFANEY","SHERYLL","SHARIE","SHANAE","SAU","RAISA","PA","NED
A","MITSUKO","MIRELLA","MILDA","MARYANNA","MARAGRET","MABELLE","LUE
TTA","LORINA","LETISHA","LATARSHA","LANELLE","LAJUANA","KRISSY","KARLY
","KARENA","JON","JESSIKA","JERICA","JEANELLE","JANUARY","JALISA","JACELY
N","IZOLA","IVEY","GREGORY","EUNA","ETHA","DREW","DOMITILA","DOMINICA","
DAINA","CREOLA","CARLI","CAMIE","BUNNY","BRITTNY","ASHANTI","ANISHA","A
LEEN","ADAH","YASUKO","WINTER","VIKI","VALRIE","TONA","TINISHA","THI","TE
RISA","TATUM","TANEKA","SIMONNE","SHALANDA","SERITA","RESSIE","REFUGIA
","PAZ","OLENE","NA","MERRILL","MARGHERITA","MANDIE","MAN","MAIRE","LYN
DIA","LUCI","LORRIANE","LORETA","LEONIA","LAVONA","LASHAWNDA","LAKIA",
"KYOKO","KRYSTINA","KRYSTEN","KENIA","KELSI","JUDE","JEANICE","ISOBEL","G
EORGIANN","GENNY","FELICIDAD","EILENE","DEON","DELOISE","DEEDEE","DANN
IE","CONCEPTION","CLORA","CHERILYN","CHANG","CALANDRA","BERRY","ARMA
NDINA","ANISA","ULA","TIMOTHY","TIERA","THERESSA","STEPHANIA","SIMA","SH
YLA","SHONTA","SHERA","SHAQUITA","SHALA","SAMMY","ROSSANA","NOHEMI","
NERY","MORIAH","MELITA","MELIDA","MELANI","MARYLYNN","MARISHA","MARI
ETTE","MALORIE","MADELENE","LUDIVINA","LORIA","LORETTE","LORALEE","LIA
NNE","LEON","LAVENIA","LAURINDA","LASHON","KIT","KIMI","KEILA","KATELYN
N","KAI","JONE","JOANE","JI","JAYNA","JANELLA","JA","HUE","HERTHA","FRANCE
NE","ELINORE","DESPINA","DELSIE","DEEDRA","CLEMENCIA","CARRY","CAROLIN"
,"CARLOS","BULAH","BRITTANIE","BOK","BLONDELL","BIBI","BEAULAH","BEATA",
"ANNITA","AGRIPINA","VIRGEN","VALENE","UN","TWANDA","TOMMYE","TOI","TA
RRA","TARI","TAMMERA","SHAKIA","SADYE","RUTHANNE","ROCHEL","RIVKA","P
URA","NENITA","NATISHA","MING","MERRILEE","MELODEE","MARVIS","LUCILLA",
"LEENA","LAVETA","LARITA","LANIE","KEREN","ILEEN","GEORGEANN","GENNA","
GENESIS","FRIDA","EWA","EUFEMIA","EMELY","ELA","EDYTH","DEONNA","DEADR
A","DARLENA","CHANELL","CHAN","CATHERN","CASSONDRA","CASSAUNDRA","B
ERNARDA","BERNA","ARLINDA","ANAMARIA","ALBERT","WESLEY","VERTIE","VA

LERI","TORRI","TATYANA","STASIA","SHERISE","SHERILL","SEASON","SCOTTIE","S
ANDA","RUTHE","ROSY","ROBERTO","ROBBI","RANEE","QUYEN","PEARLY","PALMI
RA","ONITA","NISHA","NIESHA","NIDA","NEVADA","NAM","MERLYN","MAYOLA","
MARYLOUISE","MARYLAND","MARX","MARTH","MARGENE","MADELAINE","LON
DA","LEONTINE","LEOMA","LEIA","LAWRENCE","LAURALEE","LANORA","LAKITA"
,"KIYOKO","KETURAH","KATELIN","KAREEN","JONIE","JOHNETTE","JENEE","JEAN
ETT","IZETTA","HIEDI","HEIKE","HASSIE","HAROLD","GIUSEPPINA","GEORGANN","
FIDELA","FERNANDE","ELWANDA","ELLAMAE","ELIZ","DUSTI","DOTTY","CYNDY",
"CORALIE","CELESTA","ARGENTINA","ALVERTA","XENIA","WAVA","VANETTA","T
ORRIE","TASHINA","TANDY","TAMBRA","TAMA","STEPANIE","SHILA","SHAUNTA",
"SHARAN","SHANIQUA","SHAE","SETSUKO","SERAFINA","SANDEE","ROSAMARIA",
"PRISCILA","OLINDA","NADENE","MUOI","MICHELINA","MERCEDEZ","MARYROSE"
,"MARIN","MARCENE","MAO","MAGALI","MAFALDA","LOGAN","LINN","LANNIE","
KAYCE","KAROLINE","KAMILAH","KAMALA","JUSTA","JOLINE","JENNINE","JACQU
ETTA","IRAIDA","GERALD","GEORGEANNA","FRANCHESCA","FAIRY","EMELINE","
ELANE","EHTEL","EARLIE","DULCIE","DALENE","CRIS","CLASSIE","CHERE","CHARI
S","CAROYLN","CARMINA","CARITA","BRIAN","BETHANIE","AYAKO","ARICA","AN
","ALYSA","ALESSANDRA","AKILAH","ADRIEN","ZETTA","YOULANDA","YELENA","
YAHAIRA","XUAN","WENDOLYN","VICTOR","TIJUANA","TERRELL","TERINA","TER
ESIA","SUZI","SUNDAY","SHERELL","SHAVONDA","SHAUNTE","SHARDA","SHAKIT
A","SENA","RYANN","RUBI","RIVA","REGINIA","REA","RACHAL","PARTHENIA","PA
MULA","MONNIE","MONET","MICHAELE","MELIA","MARINE","MALKA","MAISHA","
LISANDRA","LEO","LEKISHA","LEAN","LAURENCE","LAKENDRA","KRYSTIN","KOR
TNEY","KIZZIE","KITTIE","KERA","KENDAL","KEMBERLY","KANISHA","JULENE","J
ULE","JOSHUA","JOHANNE","JEFFREY","JAMEE","HAN","HALLEY","GIDGET","GALI
NA","FREDRICKA","FLETA","FATIMAH","EUSEBIA","ELZA","ELEONORE","DORTHE
Y","DORIA","DONELLA","DINORAH","DELORSE","CLARETHA","CHRISTINIA","CHAR
LYN","BONG","BELKIS","AZZIE","ANDERA","AIKO","ADENA","YER","YAJAIRA","WA
N","VANIA","ULRIKE","TOSHIA","TIFANY","STEFANY","SHIZUE","SHENIKA","SHAW
ANNA","SHAROLYN","SHARILYN","SHAQUANA","SHANTAY","SEE","ROZANNE","R
OSELEE","RICKIE","REMONA","REANNA","RAELENE","QUINN","PHUNG","PETRONI
LA","NATACHA","NANCEY","MYRL","MIYOKO","MIESHA","MERIDETH","MARVELL
A","MARQUITTA","MARHTA","MARCHELLE","LIZETH","LIBBIE","LAHOMA","LADA
WN","KINA","KATHELEEN","KATHARYN","KARISA","KALEIGH","JUNIE","JULIEANN
","JOHNSIE","JANEAN","JAIMEE","JACKQUELINE","HISAKO","HERMA","HELAINE","
GWYNETH","GLENN","GITA","EUSTOLIA","EMELINA","ELIN","EDRIS","DONNETTE",
"DONNETTA","DIERDRE","DENAE","DARCEL","CLAUDE","CLARISA","CINDERELLA"
,"CHIA","CHARLESETTA","CHARITA","CELSA","CASSY","CASSI","CARLEE","BRUNA
","BRITTANEY","BRANDE","BILLI","BAO","ANTONETTA","ANGLA","ANGELYN","AN

ALISA","ALANE","WENONA","WENDIE","VERONIQUE","VANNESA","TOBIE","TEMPI
E","SUMIKO","SULEMA","SPARKLE","SOMER","SHEBA","SHAYNE","SHARICE","SHA
NEL","SHALON","SAGE","ROY","ROSIO","ROSELIA","RENAY","REMA","REENA","PO
RSCHE","PING","PEG","OZIE","ORETHA","ORALEE","ODA","NU","NGAN","NAKESHA
","MILLY","MARYBELLE","MARLIN","MARIS","MARGRETT","MARAGARET","MANIE
","LURLENE","LILLIA","LIESELOTTE","LAVELLE","LASHAUNDA","LAKEESHA","KEI
TH","KAYCEE","KALYN","JOYA","JOETTE","JENAE","JANIECE","ILLA","GRISEL","GL
AYDS","GENEVIE","GALA","FREDDA","FRED","ELMER","ELEONOR","DEBERA","DE
ANDREA","DAN","CORRINNE","CORDIA","CONTESSA","COLENE","CLEOTILDE","CH
ARLOTT","CHANTAY","CECILLE","BEATRIS","AZALEE","ARLEAN","ARDATH","ANJ
ELICA","ANJA","ALFREDIA","ALEISHA","ADAM","ZADA","YUONNE","XIAO","WILL
ODEAN","WHITLEY","VENNIE","VANNA","TYISHA","TOVA","TORIE","TONISHA","TI
LDA","TIEN","TEMPLE","SIRENA","SHERRIL","SHANTI","SHAN","SENAIDA","SAMEL
LA","ROBBYN","RENDA","REITA","PHEBE","PAULITA","NOBUKO","NGUYET","NEO
MI","MOON","MIKAELA","MELANIA","MAXIMINA","MARG","MAISIE","LYNNA","LIL
LI","LAYNE","LASHAUN","LAKENYA","LAEL","KIRSTIE","KATHLINE","KASHA","KA
RLYN","KARIMA","JOVAN","JOSEFINE","JENNELL","JACQUI","JACKELYN","HYO","H
IEN","GRAZYNA","FLORRIE","FLORIA","ELEONORA","DWANA","DORLA","DONG","
DELMY","DEJA","DEDE","DANN","CRYSTA","CLELIA","CLARIS","CLARENCE","CHIE
KO","CHERLYN","CHERELLE","CHARMAIN","CHARA","CAMMY","BEE","ARNETTE",
"ARDELLE","ANNIKA","AMIEE","AMEE","ALLENA","YVONE","YUKI","YOSHIE","YE
VETTE","YAEL","WILLETTA","VONCILE","VENETTA","TULA","TONETTE","TIMIKA",
"TEMIKA","TELMA","TEISHA","TAREN","TA","STACEE","SHIN","SHAWNTA","SATUR
NINA","RICARDA","POK","PASTY","ONIE","NUBIA","MORA","MIKE","MARIELLE","M
ARIELLA","MARIANELA","MARDELL","MANY","LUANNA","LOISE","LISABETH","LI
NDSY","LILLIANA","LILLIAM","LELAH","LEIGHA","LEANORA","LANG","KRISTEEN"
,"KHALILAH","KEELEY","KANDRA","JUNKO","JOAQUINA","JERLENE","JANI","JAMI
KA","JAME","HSIU","HERMILA","GOLDEN","GENEVIVE","EVIA","EUGENA","EMMAL
INE","ELFREDA","ELENE","DONETTE","DELCIE","DEEANNA","DARCEY","CUC","CL
ARINDA","CIRA","CHAE","CELINDA","CATHERYN","CATHERIN","CASIMIRA","CAR
MELIA","CAMELLIA","BREANA","BOBETTE","BERNARDINA","BEBE","BASILIA","AR
LYNE","AMAL","ALAYNA","ZONIA","ZENIA","YURIKO","YAEKO","WYNELL","WILL
OW","WILLENA","VERNIA","TU","TRAVIS","TORA","TERRILYN","TERICA","TENESH
A","TAWNA","TAJUANA","TAINA","STEPHNIE","SONA","SOL","SINA","SHONDRA","S
HIZUKO","SHERLENE","SHERICE","SHARIKA","ROSSIE","ROSENA","RORY","RIMA","
RIA","RHEBA","RENNA","PETER","NATALYA","NANCEE","MELODI","MEDA","MAXI
MA","MATHA","MARKETTA","MARICRUZ","MARCELENE","MALVINA","LUBA","LO
UETTA","LEIDA","LECIA","LAURAN","LASHAWNA","LAINE","KHADIJAH","KATERI
NE","KASI","KALLIE","JULIETTA","JESUSITA","JESTINE","JESSIA","JEREMY","JEFFIE

","JANYCE","ISADORA","GEORGIANNE","FIDELIA","EVITA","EURA","EULAH","ESTE
FANA","ELSY","ELIZABET","ELADIA","DODIE","DION","DIA","DENISSE","DELORAS"
,"DELILA","DAYSI","DAKOTA","CURTIS","CRYSTLE","CONCHA","COLBY","CLARET
TA","CHU","CHRISTIA","CHARLSIE","CHARLENA","CARYLON","BETTYANN","ASLE
Y","ASHLEA","AMIRA","AI","AGUEDA","AGNUS","YUETTE","VINITA","VICTORINA",
"TYNISHA","TREENA","TOCCARA","TISH","THOMASENA","TEGAN","SOILA","SHILO
H","SHENNA","SHARMAINE","SHANTAE","SHANDI","SEPTEMBER","SARAN","SARAI
","SANA","SAMUEL","SALLEY","ROSETTE","ROLANDE","REGINE","OTELIA","OSCAR
","OLEVIA","NICHOLLE","NECOLE","NAIDA","MYRTA","MYESHA","MITSUE","MINT
A","MERTIE","MARGY","MAHALIA","MADALENE","LOVE","LOURA","LOREAN","LE
WIS","LESHA","LEONIDA","LENITA","LAVONE","LASHELL","LASHANDRA","LAMON
ICA","KIMBRA","KATHERINA","KARRY","KANESHA","JULIO","JONG","JENEVA","JA
QUELYN","HWA","GILMA","GHISLAINE","GERTRUDIS","FRANSISCA","FERMINA","E
TTIE","ETSUKO","ELLIS","ELLAN","ELIDIA","EDRA","DORETHEA","DOREATHA","DE
NYSE","DENNY","DEETTA","DAINE","CYRSTAL","CORRIN","CAYLA","CARLITA","C
AMILA","BURMA","BULA","BUENA","BLAKE","BARABARA","AVRIL","AUSTIN","AL
AINE","ZANA","WILHEMINA","WANETTA","VIRGIL","VI","VERONIKA","VERNON","
VERLINE","VASILIKI","TONITA","TISA","TEOFILA","TAYNA","TAUNYA","TANDRA",
"TAKAKO","SUNNI","SUANNE","SIXTA","SHARELL","SEEMA","RUSSELL","ROSEND
A","ROBENA","RAYMONDE","PEI","PAMILA","OZELL","NEIDA","NEELY","MISTIE","
MICHA","MERISSA","MAURITA","MARYLN","MARYETTA","MARSHALL","MARCELL
","MALENA","MAKEDA","MADDIE","LOVETTA","LOURIE","LORRINE","LORILEE","L
ESTER","LAURENA","LASHAY","LARRAINE","LAREE","LACRESHA","KRISTLE","KRI
SHNA","KEVA","KEIRA","KAROLE","JOIE","JINNY","JEANNETTA","JAMA","HEIDY","
GILBERTE","GEMA","FAVIOLA","EVELYNN","ENDA","ELLI","ELLENA","DIVINA","D
AGNY","COLLENE","CODI","CINDIE","CHASSIDY","CHASIDY","CATRICE","CATHERI
NA","CASSEY","CAROLL","CARLENA","CANDRA","CALISTA","BRYANNA","BRITTE
NY","BEULA","BARI","AUDRIE","AUDRIA","ARDELIA","ANNELLE","ANGILA","ALON
A","ALLYN","DOUGLAS","ROGER","JONATHAN","RALPH","NICHOLAS","BENJAMIN"
,"BRUCE","HARRY","WAYNE","STEVE","HOWARD","ERNEST","PHILLIP","TODD","CR
AIG","ALAN","PHILIP","EARL","DANNY","BRYAN","STANLEY","LEONARD","NATHA
N","MANUEL","RODNEY","MARVIN","VINCENT","JEFFERY","JEFF","CHAD","JACOB"
,"ALFRED","BRADLEY","HERBERT","FREDERICK","EDWIN","DON","RICKY","RAND
ALL","BARRY","BERNARD","LEROY","MARCUS","THEODORE","CLIFFORD","MIGUE
L","JIM","TOM","CALVIN","BILL","LLOYD","DEREK","WARREN","DARRELL","JEROM
E","FLOYD","ALVIN","TIM","GORDON","GREG","JORGE","DUSTIN","PEDRO","DERRI
CK","ZACHARY","HERMAN","GLEN","HECTOR","RICARDO","RICK","BRENT","RAMO
N","GILBERT","MARC","REGINALD","RUBEN","NATHANIEL","RAFAEL","EDGAR","M
ILTON","RAUL","BEN","CHESTER","DUANE","FRANKLIN","BRAD","RON","ROLAND",

"ARNOLD","HARVEY","JARED","ERIK","DARRYL","NEIL","JAVIER","FERNANDO","C
LINTON","TED","MATHEW","TYRONE","DARREN","LANCE","KURT","ALLAN","NELS
ON","GUY","CLAYTON","HUGH","MAX","DWAYNE","DWIGHT","ARMANDO","FELIX
","EVERETT","IAN","WALLACE","KEN","BOB","ALFREDO","ALBERTO","DAVE","IVA
N","BYRON","ISAAC","MORRIS","CLIFTON","WILLARD","ROSS","ANDY","SALVADO
R","KIRK","SERGIO","SETH","KENT","TERRANCE","EDUARDO","TERRENCE","ENRIQ
UE","WADE","STUART","FREDRICK","ARTURO","ALEJANDRO","NICK","LUTHER","
WENDELL","JEREMIAH","JULIUS","OTIS","TREVOR","OLIVER","LUKE","HOMER","G
ERARD","DOUG","KENNY","HUBERT","LYLE","MATT","ALFONSO","ORLANDO","RE
X","CARLTON","ERNESTO","NEAL","PABLO","LORENZO","OMAR","WILBUR","GRAN
T","HORACE","RODERICK","ABRAHAM","WILLIS","RICKEY","ANDRES","CESAR","JO
HNATHAN","MALCOLM","RUDOLPH","DAMON","KELVIN","PRESTON","ALTON","AR
CHIE","MARCO","WM","PETE","RANDOLPH","GARRY","GEOFFREY","JONATHON","F
ELIPE","GERARDO","ED","DOMINIC","DELBERT","COLIN","GUILLERMO","EARNEST
","LUCAS","BENNY","SPENCER","RODOLFO","MYRON","EDMUND","GARRETT","SAL
VATORE","CEDRIC","LOWELL","GREGG","SHERMAN","WILSON","SYLVESTER","RO
OSEVELT","ISRAEL","JERMAINE","FORREST","WILBERT","LELAND","SIMON","CLA
RK","IRVING","BRYANT","OWEN","RUFUS","WOODROW","KRISTOPHER","MACK","L
EVI","MARCOS","GUSTAVO","JAKE","LIONEL","GILBERTO","CLINT","NICOLAS","IS
MAEL","ORVILLE","ERVIN","DEWEY","AL","WILFRED","JOSH","HUGO","IGNACIO","
CALEB","TOMAS","SHELDON","ERICK","STEWART","DOYLE","DARREL","ROGELIO"
,"TERENCE","SANTIAGO","ALONZO","ELIAS","BERT","ELBERT","RAMIRO","CONRA
D","NOAH","GRADY","PHIL","CORNELIUS","LAMAR","ROLANDO","CLAY","PERCY",
"DEXTER","BRADFORD","DARIN","AMOS","MOSES","IRVIN","SAUL","ROMAN","RAN
DAL","TIMMY","DARRIN","WINSTON","BRENDAN","ABEL","DOMINICK","BOYD","E
MILIO","ELIJAH","DOMINGO","EMMETT","MARLON","EMANUEL","JERALD","EDMO
ND","EMIL","DEWAYNE","WILL","OTTO","TEDDY","REYNALDO","BRET","JESS","TR
ENT","HUMBERTO","EMMANUEL","STEPHAN","VICENTE","LAMONT","GARLAND","
MILES","EFRAIN","HEATH","RODGER","HARLEY","ETHAN","ELDON","ROCKY","PIE
RRE","JUNIOR","FREDDY","ELI","BRYCE","ANTOINE","STERLING","CHASE","GROVE
R","ELTON","CLEVELAND","DYLAN","CHUCK","DAMIAN","REUBEN","STAN","AUG
UST","LEONARDO","JASPER","RUSSEL","ERWIN","BENITO","HANS","MONTE","BLAI
NE","ERNIE","CURT","QUENTIN","AGUSTIN","MURRAY","JAMAL","ADOLFO","HARR
ISON","TYSON","BURTON","BRADY","ELLIOTT","WILFREDO","BART","JARROD","V
ANCE","DENIS","DAMIEN","JOAQUIN","HARLAN","DESMOND","ELLIOT","DARWIN",
"GREGORIO","BUDDY","XAVIER","KERMIT","ROSCOE","ESTEBAN","ANTON","SOLO
MON","SCOTTY","NORBERT","ELVIN","WILLIAMS","NOLAN","ROD","QUINTON","H
AL","BRAIN","ROB","ELWOOD","KENDRICK","DARIUS","MOISES","FIDEL","THADDE
US","CLIFF","MARCEL","JACKSON","RAPHAEL","BRYON","ARMAND","ALVARO","JE

FFRY","DANE","JOESPH","THURMAN","NED","RUSTY","MONTY","FABIAN","REGGIE
","MASON","GRAHAM","ISAIAH","VAUGHN","GUS","LOYD","DIEGO","ADOLPH","NO
RRIS","MILLARD","ROCCO","GONZALO","DERICK","RODRIGO","WILEY","RIGOBER
TO","ALPHONSO","TY","NOE","VERN","REED","JEFFERSON","ELVIS","BERNARDO","
MAURICIO","HIRAM","DONOVAN","BASIL","RILEY","NICKOLAS","MAYNARD","SCO
T","VINCE","QUINCY","EDDY","SEBASTIAN","FEDERICO","ULYSSES","HERIBERTO",
"DONNELL","COLE","DAVIS","GAVIN","EMERY","WARD","ROMEO","JAYSON","DAN
TE","CLEMENT","COY","MAXWELL","JARVIS","BRUNO","ISSAC","DUDLEY","BROCK
","SANFORD","CARMELO","BARNEY","NESTOR","STEFAN","DONNY","ART","LINWO
OD","BEAU","WELDON","GALEN","ISIDRO","TRUMAN","DELMAR","JOHNATHON","S
ILAS","FREDERIC","DICK","IRWIN","MERLIN","CHARLEY","MARCELINO","HARRIS",
"CARLO","TRENTON","KURTIS","HUNTER","AURELIO","WINFRED","VITO","COLLIN
","DENVER","CARTER","LEONEL","EMORY","PASQUALE","MOHAMMAD","MARIAN
O","DANIAL","LANDON","DIRK","BRANDEN","ADAN","BUFORD","GERMAN","WILM
ER","EMERSON","ZACHERY","FLETCHER","JACQUES","ERROL","DALTON","MONRO
E","JOSUE","EDWARDO","BOOKER","WILFORD","SONNY","SHELTON","CARSON","T
HERON","RAYMUNDO","DAREN","HOUSTON","ROBBY","LINCOLN","GENARO","BE
NNETT","OCTAVIO","CORNELL","HUNG","ARRON","ANTONY","HERSCHEL","GIOVA
NNI","GARTH","CYRUS","CYRIL","RONNY","LON","FREEMAN","DUNCAN","KENNIT
H","CARMINE","ERICH","CHADWICK","WILBURN","RUSS","REID","MYLES","ANDER
SON","MORTON","JONAS","FOREST","MITCHEL","MERVIN","ZANE","RICH","JAMEL"
,"LAZARO","ALPHONSE","RANDELL","MAJOR","JARRETT","BROOKS","ABDUL","LU
CIANO","SEYMOUR","EUGENIO","MOHAMMED","VALENTIN","CHANCE","ARNULFO
","LUCIEN","FERDINAND","THAD","EZRA","ALDO","RUBIN","ROYAL","MITCH","EAR
LE","ABE","WYATT","MARQUIS","LANNY","KAREEM","JAMAR","BORIS","ISIAH","E
MILE","ELMO","ARON","LEOPOLDO","EVERETTE","JOSEF","ELOY","RODRICK","REI
NALDO","LUCIO","JERROD","WESTON","HERSHEL","BARTON","PARKER","LEMUEL"
,"BURT","JULES","GIL","ELISEO","AHMAD","NIGEL","EFREN","ANTWAN","ALDEN","
MARGARITO","COLEMAN","DINO","OSVALDO","LES","DEANDRE","NORMAND","KI
ETH","TREY","NORBERTO","NAPOLEON","JEROLD","FRITZ","ROSENDO","MILFORD"
,"CHRISTOPER","ALFONZO","LYMAN","JOSIAH","BRANT","WILTON","RICO","JAMA
AL","DEWITT","BRENTON","OLIN","FOSTER","FAUSTINO","CLAUDIO","JUDSON","GI
NO","EDGARDO","ALEC","TANNER","JARRED","DONN","TAD","PRINCE","PORFIRIO"
,"ODIS","LENARD","CHAUNCEY","TOD","MEL","MARCELO","KORY","AUGUSTUS","
KEVEN","HILARIO","BUD","SAL","ORVAL","MAURO","ZACHARIAH","OLEN","ANIBA
L","MILO","JED","DILLON","AMADO","NEWTON","LENNY","RICHIE","HORACIO","BR
ICE","MOHAMED","DELMER","DARIO","REYES","MAC","JONAH","JERROLD","ROBT"
,"HANK","RUPERT","ROLLAND","KENTON","DAMION","ANTONE","WALDO","FREDR
IC","BRADLY","KIP","BURL","WALKER","TYREE","JEFFEREY","AHMED","WILLY","S

TANFORD","OREN","NOBLE","MOSHE","MIKEL","ENOCH","BRENDON","QUINTIN","J
AMISON","FLORENCIO","DARRICK","TOBIAS","HASSAN","GIUSEPPE","DEMARCUS",
"CLETUS","TYRELL","LYNDON","KEENAN","WERNER","GERALDO","COLUMBUS","
CHET","BERTRAM","MARKUS","HUEY","HILTON","DWAIN","DONTE","TYRON","OM
ER","ISAIAS","HIPOLITO","FERMIN","ADALBERTO","BO","BARRETT","TEODORO","
MCKINLEY","MAXIMO","GARFIELD","RALEIGH","LAWERENCE","ABRAM","RASHA
D","KING","EMMITT","DARON","SAMUAL","MIQUEL","EUSEBIO","DOMENIC","DAR
RON","BUSTER","WILBER","RENATO","JC","HOYT","HAYWOOD","EZEKIEL","CHAS",
"FLORENTINO","ELROY","CLEMENTE","ARDEN","NEVILLE","EDISON","DESHAWN",
"NATHANIAL","JORDON","DANILO","CLAUD","SHERWOOD","RAYMON","RAYFORD
","CRISTOBAL","AMBROSE","TITUS","HYMAN","FELTON","EZEQUIEL","ERASMO","S
TANTON","LONNY","LEN","IKE","MILAN","LINO","JAROD","HERB","ANDREAS","WA
LTON","RHETT","PALMER","DOUGLASS","CORDELL","OSWALDO","ELLSWORTH","
VIRGILIO","TONEY","NATHANAEL","DEL","BENEDICT","MOSE","JOHNSON","ISREA
L","GARRET","FAUSTO","ASA","ARLEN","ZACK","WARNER","MODESTO","FRANCES
CO","MANUAL","GAYLORD","GASTON","FILIBERTO","DEANGELO","MICHALE","GR
ANVILLE","WES","MALIK","ZACKARY","TUAN","ELDRIDGE","CRISTOPHER","CORT
EZ","ANTIONE","MALCOM","LONG","KOREY","JOSPEH","COLTON","WAYLON","VO
N","HOSEA","SHAD","SANTO","RUDOLF","ROLF","REY","RENALDO","MARCELLUS",
"LUCIUS","KRISTOFER","BOYCE","BENTON","HAYDEN","HARLAND","ARNOLDO","
RUEBEN","LEANDRO","KRAIG","JERRELL","JEROMY","HOBERT","CEDRICK","ARLIE
","WINFORD","WALLY","LUIGI","KENETH","JACINTO","GRAIG","FRANKLYN","EDM
UNDO","SID","PORTER","LEIF","JERAMY","BUCK","WILLIAN","VINCENZO","SHON","
LYNWOOD","JERE","HAI","ELDEN","DORSEY","DARELL","BRODERICK","ALONSO"]
def alphabeticalorder(x):
  return sorted(x)
def namescore(x):
  alphabetizednames = alphabeticalorder(x)
  letters = ["A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q",
"R", "S", "T", "U", "V", "W", "X", "Y", "Z"]
  namescorelist = []
  counter = 0
  for i in alphabetizednames:
    for j in i:
      for k in letters:
        if j == k:
          counter += int(letters.index(k)) + 1
    namescorelist.append(counter)
    counter = 0

```
  return namescorelist
def positionscore(x):
  positionscorelist = []
  alphabetizednames = alphabeticalorder(x)
  for i in alphabetizednames:
    score = int(alphabetizednames.index(i)) + 1
    positionscorelist.append(score)
  return positionscorelist
def answertotheproblem():
  answertoproblem22 = 0
  a = namescore(names)
  b = positionscore(names)
  for (i, j) in zip(a, b):
    total = i * j
    answertoproblem22 += total
  return answertoproblem22
print (answertotheproblem())
#24----------------------------------------------------------------------------------------------------------
```

A permutation is an ordered arrangement of objects. For example, 3124 is one possible permutation of the digits 1, 2, 3 and 4. If all of the permutations are listed numerically or alphabetically, we call it lexicographic order. The lexicographic permutations of 0, 1 and 2 are: 012 021 102 120 201 210. What is the millionth lexicographic permutation of the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9?

```
import itertools
def permutations(x):
        return list(itertools.permutations(x))
a = (permutations("0123456789"))
b = (a[1000000-1])
string = ""
for i in b:
        string += i
print (string)
#25----------------------------------------------------------------------------------------------------------
a = 1
b = 2
counter = 2
while True:
  counter += 1
```

```
  if len(str(b)) == 1000:
          break
  else :
          a, b = b, a + b

print (len(str(b)))

print (counter)
```
#29----------
Consider all integer combinations of ab for $2 \le a \le 5$ and $2 \le b \le 5$:
2^2=4, 2^3=8, 2^4=16, 2^5=32
3^2=9, 3^3=27, 3^4=81, 3^5=243
4^2=16, 4^3=64, 4^4=256, 4^5=1024
5^2=25, 5^3=125, 5^4=625, 5^5=3125
If they are then placed in numerical order, with any repeats removed, we get the following sequence of 15 distinct terms: 4, 8, 9, 16, 25, 27, 32, 64, 81, 125, 243, 256, 625, 1024, 3125
How many distinct terms are in the sequence generated by ab for $2 \le a \le 100$ and $2 \le b \le 100$?

```
res = []
for i in range (2,101):
  for j in range (2,101):
    if (i**j in res):
      pass
    else:
      res.append(i**j)

print(len(res))
```
#30----------
Surprisingly there are only three numbers that can be written as the sum of fourth powers of their digits: 1634 = 1^4 + 6^4 + 3^4 + 4^4, 8208 = 8^4 + 2^4 + 0^4 + 8^4, and 9474 = 9^4 + 4^4 + 7^4 + 4^4. As 1 = 1^4 is not a sum it is not included. The sum of these numbers is 1634 + 8208 + 9474 = 19316. Find the sum of all the numbers that can be written as the sum of fifth powers of their digits.

```
res = []
for i in range (10000,100000):
  counter = 0
  y = str(i)
  for j in range (5):
```

```
    x = int(y[j]) ** 5
    counter += x
  if counter == i:
    print (counter)
    res.append(counter)
for i in range (1000,10000):
  counter = 0
  y = str(i)
  for j in range (4):
    x = int(y[j]) ** 5
    counter += x
  if counter == i:
    print (counter)
    res.append(counter)
for i in range (100000,1000000):
  counter = 0
  y = str(i)
  for j in range (6):
    x = int(y[j]) ** 5
    counter += x
  if counter == i:
    print (counter)
    res.append(counter)
total = 0
for k in res:
  total += k
print (total)
#34----------------------------------------------------------------------------------------------------------
```

145 is a curious number, as 1! + 4! + 5! = 1 + 24 + 120 = 145. Find the sum of all numbers which are equal to the sum of the factorial of their digits. Note: as 1! = 1 and 2! = 2 are not sums they are not included.

```
from math import factorial
def sumofdigitfactorials(x):
  total = 0
  length = (len(str(x)))
  for i in range (length):
    y = int(str(x)[i])
    total += (factorial(y))
```

```
  return total
def checkequivalent(a):
  if sumofdigitfactorials(a) == a:
    return True
  return False
answer = 0
for j in range (144,10000000):
  if checkequivalent(j):
    print(j)
    answer += j
print (answer)
#35----------
```

The number, 197, is called a circular prime because all rotations of the digits: 197, 971, and 719, are themselves prime. There are thirteen such primes below 100: 2, 3, 5, 7, 11, 13, 17, 31, 37, 71, 73, 79, and 97. How many circular primes are there below one million?

```
import itertools
def checkprime(x):
  if x == 1:
    return False
  for i in range (2,int(x**0.5)+1):
    if x%i == 0:
      return False
  return True
"""
# This was not used because I needed rotations instead of all possbile permutations, but I wanted to keep it because it is a cool piece of code!
def permutations(y):
  y2 = str(y)
  x = len(y2)
  numbers = []
  stringnumber = ""
  z = (list(itertools.permutations(y2)))
  for i in (z):
    for k in i:
      stringnumber += k
      if len(stringnumber) == x:
        numbers.append(int(stringnumber))
        stringnumber = ""
```

```
  return set(numbers)
"""
def possible_rotation(a):
  rotations = []
  a2 = str(a)
  b = len(a2)
  for i in range(b):
      c = a2[i:]+a2[:i]
      rotations.append(int(c))
  return rotations
def circularprime(z):
  if not checkprime(z):
    return False
  z1 = possible_rotation(z)
  for i in z1:
    if not checkprime(i):
      return False
  return True
answers = []
for j in range (1,1000000):
  if circularprime(j):
    answers.append(j)
    print (j)
print (len(answers))
#39----------------------------------------------------------------------------------------------------------
```

If p is the perimeter of a right angle triangle with integral length sides, {a,b,c}, there are exactly three solutions for p = 120. {20,48,52}, {24,45,51}, {30,40,50}. For which value of p ≤ 1000, is the number of solutions maximised?

```
def pythagoreanGenerator(num):
    counter = 0
    for a in range(1,int(num/2)+1):
        for b in range(a,int(num/2)+1):
            c = num - a - b
            if c ** 2 == a ** 2 + b ** 2:
                counter += 1
    return counter
def main():
    solutions = [0]
```

```
    for i in range(1,1001):
        pythagoreanSolutions = pythagoreanGenerator(i)
        solutions.append(pythagoreanSolutions)
    sortedsolutions = sorted(solutions)
    mostsolutions = sortedsolutions[-1]
    answer = solutions.index(mostsolutions)
    return answer
print (main())
```

#40----------

An irrational decimal fraction is created by concatenating the positive integers: 0.12345678910111213141516171819202 1… It can be seen that the 12th digit of the fractional part is 1. If dn represents the nth digit of the fractional part, find the value of the following expression. d1 × d10 × d100 × d1000 × d10000 × d100000 × d1000000

```
string = ''
counter = 1
while len(string) < 1000000:
  string += str(counter)
  counter += 1
if len(string) != 1000000:
  excess = len(string) - 1000000
  string = string[:-excess]
d = 1
answer = ''
while d < 1000001:
  answer += str(string[d-1])
  d = d * 10
theanswer = 1
for i in answer:
  theanswer = theanswer*int(i)
print (theanswer)
```

#42----------

The nth term of the sequence of triangle numbers is given by, tn = ½n(n+1); so the first ten triangle numbers are: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, … By converting each letter in a word to a number corresponding to its alphabetical position and adding these values we form a word value. For example, the word value for SKY is 19 + 11 + 25 = 55 = t10. If the word value is a triangle number then we shall call the word a triangle word. Using words.txt (right click and 'Save Link/Target As...'), a 16K text file containing nearly two-thousand common English words, how many are triangle words?

```
def trianglenumberfinder():
  trianglenumbers = []
  for i in range (1,101):
    trianglenumber = int(i/2*(i+1))
    trianglenumbers.append(trianglenumber)
  return trianglenumbers
words =
["A","ABILITY","ABLE","ABOUT","ABOVE","ABSENCE","ABSOLUTELY","ACADEMIC
","ACCEPT","ACCESS","ACCIDENT","ACCOMPANY","ACCORDING","ACCOUNT","AC
HIEVE","ACHIEVEMENT","ACID","ACQUIRE","ACROSS","ACT","ACTION","ACTIVE","
ACTIVITY","ACTUAL","ACTUALLY","ADD","ADDITION","ADDITIONAL","ADDRESS"
,"ADMINISTRATION","ADMIT","ADOPT","ADULT","ADVANCE","ADVANTAGE","AD
VICE","ADVISE","AFFAIR","AFFECT","AFFORD","AFRAID","AFTER","AFTERNOON","
AFTERWARDS","AGAIN","AGAINST","AGE","AGENCY","AGENT","AGO","AGREE","A
GREEMENT","AHEAD","AID","AIM","AIR","AIRCRAFT","ALL","ALLOW","ALMOST","
ALONE","ALONG","ALREADY","ALRIGHT","ALSO","ALTERNATIVE","ALTHOUGH","
ALWAYS","AMONG","AMONGST","AMOUNT","AN","ANALYSIS","ANCIENT","AND","
ANIMAL","ANNOUNCE","ANNUAL","ANOTHER","ANSWER","ANY","ANYBODY","AN
YONE","ANYTHING","ANYWAY","APART","APPARENT","APPARENTLY","APPEAL","
APPEAR","APPEARANCE","APPLICATION","APPLY","APPOINT","APPOINTMENT","A
PPROACH","APPROPRIATE","APPROVE","AREA","ARGUE","ARGUMENT","ARISE","A
RM","ARMY","AROUND","ARRANGE","ARRANGEMENT","ARRIVE","ART","ARTICLE
","ARTIST","AS","ASK","ASPECT","ASSEMBLY","ASSESS","ASSESSMENT","ASSET","
ASSOCIATE","ASSOCIATION","ASSUME","ASSUMPTION","AT","ATMOSPHERE","ATT
ACH","ATTACK","ATTEMPT","ATTEND","ATTENTION","ATTITUDE","ATTRACT","AT
TRACTIVE","AUDIENCE","AUTHOR","AUTHORITY","AVAILABLE","AVERAGE","AV
OID","AWARD","AWARE","AWAY","AYE","BABY","BACK","BACKGROUND","BAD","
BAG","BALANCE","BALL","BAND","BANK","BAR","BASE","BASIC","BASIS","BATTLE
","BE","BEAR","BEAT","BEAUTIFUL","BECAUSE","BECOME","BED","BEDROOM","BE
FORE","BEGIN","BEGINNING","BEHAVIOUR","BEHIND","BELIEF","BELIEVE","BELO
NG","BELOW","BENEATH","BENEFIT","BESIDE","BEST","BETTER","BETWEEN","BEY
OND","BIG","BILL","BIND","BIRD","BIRTH","BIT","BLACK","BLOCK","BLOOD","BLO
ODY","BLOW","BLUE","BOARD","BOAT","BODY","BONE","BOOK","BORDER","BOTH
","BOTTLE","BOTTOM","BOX","BOY","BRAIN","BRANCH","BREAK","BREATH","BRID
GE","BRIEF","BRIGHT","BRING","BROAD","BROTHER","BUDGET","BUILD","BUILDIN
G","BURN","BUS","BUSINESS","BUSY","BUT","BUY","BY","CABINET","CALL","CAMP
AIGN","CAN","CANDIDATE","CAPABLE","CAPACITY","CAPITAL","CAR","CARD","CA
RE","CAREER","CAREFUL","CAREFULLY","CARRY","CASE","CASH","CAT","CATCH",
```

"CATEGORY","CAUSE","CELL","CENTRAL","CENTRE","CENTURY","CERTAIN","CER
TAINLY","CHAIN","CHAIR","CHAIRMAN","CHALLENGE","CHANCE","CHANGE","CH
ANNEL","CHAPTER","CHARACTER","CHARACTERISTIC","CHARGE","CHEAP","CHE
CK","CHEMICAL","CHIEF","CHILD","CHOICE","CHOOSE","CHURCH","CIRCLE","CIRC
UMSTANCE","CITIZEN","CITY","CIVIL","CLAIM","CLASS","CLEAN","CLEAR","CLEA
RLY","CLIENT","CLIMB","CLOSE","CLOSELY","CLOTHES","CLUB","COAL","CODE","
COFFEE","COLD","COLLEAGUE","COLLECT","COLLECTION","COLLEGE","COLOUR",
"COMBINATION","COMBINE","COME","COMMENT","COMMERCIAL","COMMISSION
","COMMIT","COMMITMENT","COMMITTEE","COMMON","COMMUNICATION","CO
MMUNITY","COMPANY","COMPARE","COMPARISON","COMPETITION","COMPLETE
","COMPLETELY","COMPLEX","COMPONENT","COMPUTER","CONCENTRATE","CON
CENTRATION","CONCEPT","CONCERN","CONCERNED","CONCLUDE","CONCLUSIO
N","CONDITION","CONDUCT","CONFERENCE","CONFIDENCE","CONFIRM","CONFLI
CT","CONGRESS","CONNECT","CONNECTION","CONSEQUENCE","CONSERVATIVE",
"CONSIDER","CONSIDERABLE","CONSIDERATION","CONSIST","CONSTANT","CONS
TRUCTION","CONSUMER","CONTACT","CONTAIN","CONTENT","CONTEXT","CONTI
NUE","CONTRACT","CONTRAST","CONTRIBUTE","CONTRIBUTION","CONTROL","C
ONVENTION","CONVERSATION","COPY","CORNER","CORPORATE","CORRECT","CO
S","COST","COULD","COUNCIL","COUNT","COUNTRY","COUNTY","COUPLE","COUR
SE","COURT","COVER","CREATE","CREATION","CREDIT","CRIME","CRIMINAL","CRI
SIS","CRITERION","CRITICAL","CRITICISM","CROSS","CROWD","CRY","CULTURAL",
"CULTURE","CUP","CURRENT","CURRENTLY","CURRICULUM","CUSTOMER","CUT",
"DAMAGE","DANGER","DANGEROUS","DARK","DATA","DATE","DAUGHTER","DAY"
,"DEAD","DEAL","DEATH","DEBATE","DEBT","DECADE","DECIDE","DECISION","DEC
LARE","DEEP","DEFENCE","DEFENDANT","DEFINE","DEFINITION","DEGREE","DELI
VER","DEMAND","DEMOCRATIC","DEMONSTRATE","DENY","DEPARTMENT","DEPE
ND","DEPUTY","DERIVE","DESCRIBE","DESCRIPTION","DESIGN","DESIRE","DESK","
DESPITE","DESTROY","DETAIL","DETAILED","DETERMINE","DEVELOP","DEVELOP
MENT","DEVICE","DIE","DIFFERENCE","DIFFERENT","DIFFICULT","DIFFICULTY","D
INNER","DIRECT","DIRECTION","DIRECTLY","DIRECTOR","DISAPPEAR","DISCIPLIN
E","DISCOVER","DISCUSS","DISCUSSION","DISEASE","DISPLAY","DISTANCE","DISTI
NCTION","DISTRIBUTION","DISTRICT","DIVIDE","DIVISION","DO","DOCTOR","DOC
UMENT","DOG","DOMESTIC","DOOR","DOUBLE","DOUBT","DOWN","DRAW","DRAW
ING","DREAM","DRESS","DRINK","DRIVE","DRIVER","DROP","DRUG","DRY","DUE","
DURING","DUTY","EACH","EAR","EARLY","EARN","EARTH","EASILY","EAST","EAS
Y","EAT","ECONOMIC","ECONOMY","EDGE","EDITOR","EDUCATION","EDUCATION
AL","EFFECT","EFFECTIVE","EFFECTIVELY","EFFORT","EGG","EITHER","ELDERLY",
"ELECTION","ELEMENT","ELSE","ELSEWHERE","EMERGE","EMPHASIS","EMPLOY","
EMPLOYEE","EMPLOYER","EMPLOYMENT","EMPTY","ENABLE","ENCOURAGE","EN

D","ENEMY","ENERGY","ENGINE","ENGINEERING","ENJOY","ENOUGH","ENSURE","
ENTER","ENTERPRISE","ENTIRE","ENTIRELY","ENTITLE","ENTRY","ENVIRONMENT
","ENVIRONMENTAL","EQUAL","EQUALLY","EQUIPMENT","ERROR","ESCAPE","ESP
ECIALLY","ESSENTIAL","ESTABLISH","ESTABLISHMENT","ESTATE","ESTIMATE","E
VEN","EVENING","EVENT","EVENTUALLY","EVER","EVERY","EVERYBODY","EVER
YONE","EVERYTHING","EVIDENCE","EXACTLY","EXAMINATION","EXAMINE","EX
AMPLE","EXCELLENT","EXCEPT","EXCHANGE","EXECUTIVE","EXERCISE","EXHIBI
TION","EXIST","EXISTENCE","EXISTING","EXPECT","EXPECTATION","EXPENDITUR
E","EXPENSE","EXPENSIVE","EXPERIENCE","EXPERIMENT","EXPERT","EXPLAIN","
EXPLANATION","EXPLORE","EXPRESS","EXPRESSION","EXTEND","EXTENT","EXTE
RNAL","EXTRA","EXTREMELY","EYE","FACE","FACILITY","FACT","FACTOR","FACT
ORY","FAIL","FAILURE","FAIR","FAIRLY","FAITH","FALL","FAMILIAR","FAMILY","F
AMOUS","FAR","FARM","FARMER","FASHION","FAST","FATHER","FAVOUR","FEAR"
,"FEATURE","FEE","FEEL","FEELING","FEMALE","FEW","FIELD","FIGHT","FIGURE","
FILE","FILL","FILM","FINAL","FINALLY","FINANCE","FINANCIAL","FIND","FINDING"
,"FINE","FINGER","FINISH","FIRE","FIRM","FIRST","FISH","FIT","FIX","FLAT","FLIGH
T","FLOOR","FLOW","FLOWER","FLY","FOCUS","FOLLOW","FOLLOWING","FOOD","F
OOT","FOOTBALL","FOR","FORCE","FOREIGN","FOREST","FORGET","FORM","FORM
AL","FORMER","FORWARD","FOUNDATION","FREE","FREEDOM","FREQUENTLY","F
RESH","FRIEND","FROM","FRONT","FRUIT","FUEL","FULL","FULLY","FUNCTION","F
UND","FUNNY","FURTHER","FUTURE","GAIN","GAME","GARDEN","GAS","GATE","G
ATHER","GENERAL","GENERALLY","GENERATE","GENERATION","GENTLEMAN","
GET","GIRL","GIVE","GLASS","GO","GOAL","GOD","GOLD","GOOD","GOVERNMENT"
,"GRANT","GREAT","GREEN","GREY","GROUND","GROUP","GROW","GROWING","GR
OWTH","GUEST","GUIDE","GUN","HAIR","HALF","HALL","HAND","HANDLE","HANG
","HAPPEN","HAPPY","HARD","HARDLY","HATE","HAVE","HE","HEAD","HEALTH","
HEAR","HEART","HEAT","HEAVY","HELL","HELP","HENCE","HER","HERE","HERSEL
F","HIDE","HIGH","HIGHLY","HILL","HIM","HIMSELF","HIS","HISTORICAL","HISTOR
Y","HIT","HOLD","HOLE","HOLIDAY","HOME","HOPE","HORSE","HOSPITAL","HOT","
HOTEL","HOUR","HOUSE","HOUSEHOLD","HOUSING","HOW","HOWEVER","HUGE","
HUMAN","HURT","HUSBAND","I","IDEA","IDENTIFY","IF","IGNORE","ILLUSTRATE","
IMAGE","IMAGINE","IMMEDIATE","IMMEDIATELY","IMPACT","IMPLICATION","IMP
LY","IMPORTANCE","IMPORTANT","IMPOSE","IMPOSSIBLE","IMPRESSION","IMPRO
VE","IMPROVEMENT","IN","INCIDENT","INCLUDE","INCLUDING","INCOME","INCRE
ASE","INCREASED","INCREASINGLY","INDEED","INDEPENDENT","INDEX","INDICA
TE","INDIVIDUAL","INDUSTRIAL","INDUSTRY","INFLUENCE","INFORM","INFORMA
TION","INITIAL","INITIATIVE","INJURY","INSIDE","INSIST","INSTANCE","INSTEAD",
"INSTITUTE","INSTITUTION","INSTRUCTION","INSTRUMENT","INSURANCE","INTEN
D","INTENTION","INTEREST","INTERESTED","INTERESTING","INTERNAL","INTERN

ATIONAL","INTERPRETATION","INTERVIEW","INTO","INTRODUCE","INTRODUCTIO
N","INVESTIGATE","INVESTIGATION","INVESTMENT","INVITE","INVOLVE","IRON",
"IS","ISLAND","ISSUE","IT","ITEM","ITS","ITSELF","JOB","JOIN","JOINT","JOURNEY","
JUDGE","JUMP","JUST","JUSTICE","KEEP","KEY","KID","KILL","KIND","KING","KITC
HEN","KNEE","KNOW","KNOWLEDGE","LABOUR","LACK","LADY","LAND","LANGU
AGE","LARGE","LARGELY","LAST","LATE","LATER","LATTER","LAUGH","LAUNCH"
,"LAW","LAWYER","LAY","LEAD","LEADER","LEADERSHIP","LEADING","LEAF","LE
AGUE","LEAN","LEARN","LEAST","LEAVE","LEFT","LEG","LEGAL","LEGISLATION","
LENGTH","LESS","LET","LETTER","LEVEL","LIABILITY","LIBERAL","LIBRARY","LIE
","LIFE","LIFT","LIGHT","LIKE","LIKELY","LIMIT","LIMITED","LINE","LINK","LIP","LI
ST","LISTEN","LITERATURE","LITTLE","LIVE","LIVING","LOAN","LOCAL","LOCATIO
N","LONG","LOOK","LORD","LOSE","LOSS","LOT","LOVE","LOVELY","LOW","LUNCH
","MACHINE","MAGAZINE","MAIN","MAINLY","MAINTAIN","MAJOR","MAJORITY","
MAKE","MALE","MAN","MANAGE","MANAGEMENT","MANAGER","MANNER","MAN
Y","MAP","MARK","MARKET","MARRIAGE","MARRIED","MARRY","MASS","MASTE
R","MATCH","MATERIAL","MATTER","MAY","MAYBE","ME","MEAL","MEAN","MEA
NING","MEANS","MEANWHILE","MEASURE","MECHANISM","MEDIA","MEDICAL","
MEET","MEETING","MEMBER","MEMBERSHIP","MEMORY","MENTAL","MENTION","
MERELY","MESSAGE","METAL","METHOD","MIDDLE","MIGHT","MILE","MILITARY"
,"MILK","MIND","MINE","MINISTER","MINISTRY","MINUTE","MISS","MISTAKE","MO
DEL","MODERN","MODULE","MOMENT","MONEY","MONTH","MORE","MORNING","
MOST","MOTHER","MOTION","MOTOR","MOUNTAIN","MOUTH","MOVE","MOVEME
NT","MUCH","MURDER","MUSEUM","MUSIC","MUST","MY","MYSELF","NAME","NA
RROW","NATION","NATIONAL","NATURAL","NATURE","NEAR","NEARLY","NECESS
ARILY","NECESSARY","NECK","NEED","NEGOTIATION","NEIGHBOUR","NEITHER","
NETWORK","NEVER","NEVERTHELESS","NEW","NEWS","NEWSPAPER","NEXT","NIC
E","NIGHT","NO","NOBODY","NOD","NOISE","NONE","NOR","NORMAL","NORMALL
Y","NORTH","NORTHERN","NOSE","NOT","NOTE","NOTHING","NOTICE","NOTION","
NOW","NUCLEAR","NUMBER","NURSE","OBJECT","OBJECTIVE","OBSERVATION","O
BSERVE","OBTAIN","OBVIOUS","OBVIOUSLY","OCCASION","OCCUR","ODD","OF","
OFF","OFFENCE","OFFER","OFFICE","OFFICER","OFFICIAL","OFTEN","OIL","OKAY","
OLD","ON","ONCE","ONE","ONLY","ONTO","OPEN","OPERATE","OPERATION","OPINI
ON","OPPORTUNITY","OPPOSITION","OPTION","OR","ORDER","ORDINARY","ORGAN
ISATION","ORGANISE","ORGANIZATION","ORIGIN","ORIGINAL","OTHER","OTHER
WISE","OUGHT","OUR","OURSELVES","OUT","OUTCOME","OUTPUT","OUTSIDE","O
VER","OVERALL","OWN","OWNER","PACKAGE","PAGE","PAIN","PAINT","PAINTING"
,"PAIR","PANEL","PAPER","PARENT","PARK","PARLIAMENT","PART","PARTICULAR"
,"PARTICULARLY","PARTLY","PARTNER","PARTY","PASS","PASSAGE","PAST","PAT
H","PATIENT","PATTERN","PAY","PAYMENT","PEACE","PENSION","PEOPLE","PER","

PERCENT","PERFECT","PERFORM","PERFORMANCE","PERHAPS","PERIOD","PERMA
NENT","PERSON","PERSONAL","PERSUADE","PHASE","PHONE","PHOTOGRAPH","PH
YSICAL","PICK","PICTURE","PIECE","PLACE","PLAN","PLANNING","PLANT","PLASTI
C","PLATE","PLAY","PLAYER","PLEASE","PLEASURE","PLENTY","PLUS","POCKET","
POINT","POLICE","POLICY","POLITICAL","POLITICS","POOL","POOR","POPULAR","P
OPULATION","POSITION","POSITIVE","POSSIBILITY","POSSIBLE","POSSIBLY","POST
","POTENTIAL","POUND","POWER","POWERFUL","PRACTICAL","PRACTICE","PREFE
R","PREPARE","PRESENCE","PRESENT","PRESIDENT","PRESS","PRESSURE","PRETTY
","PREVENT","PREVIOUS","PREVIOUSLY","PRICE","PRIMARY","PRIME","PRINCIPLE"
,"PRIORITY","PRISON","PRISONER","PRIVATE","PROBABLY","PROBLEM","PROCED
URE","PROCESS","PRODUCE","PRODUCT","PRODUCTION","PROFESSIONAL","PROFI
T","PROGRAM","PROGRAMME","PROGRESS","PROJECT","PROMISE","PROMOTE","P
ROPER","PROPERLY","PROPERTY","PROPORTION","PROPOSE","PROPOSAL","PROSP
ECT","PROTECT","PROTECTION","PROVE","PROVIDE","PROVIDED","PROVISION","P
UB","PUBLIC","PUBLICATION","PUBLISH","PULL","PUPIL","PURPOSE","PUSH","PUT"
,"QUALITY","QUARTER","QUESTION","QUICK","QUICKLY","QUIET","QUITE","RACE
","RADIO","RAILWAY","RAIN","RAISE","RANGE","RAPIDLY","RARE","RATE","RATH
ER","REACH","REACTION","READ","READER","READING","READY","REAL","REALI
SE","REALITY","REALIZE","REALLY","REASON","REASONABLE","RECALL","RECEI
VE","RECENT","RECENTLY","RECOGNISE","RECOGNITION","RECOGNIZE","RECOM
MEND","RECORD","RECOVER","RED","REDUCE","REDUCTION","REFER","REFEREN
CE","REFLECT","REFORM","REFUSE","REGARD","REGION","REGIONAL","REGULAR
","REGULATION","REJECT","RELATE","RELATION","RELATIONSHIP","RELATIVE","
RELATIVELY","RELEASE","RELEVANT","RELIEF","RELIGION","RELIGIOUS","RELY",
"REMAIN","REMEMBER","REMIND","REMOVE","REPEAT","REPLACE","REPLY","REP
ORT","REPRESENT","REPRESENTATION","REPRESENTATIVE","REQUEST","REQUIR
E","REQUIREMENT","RESEARCH","RESOURCE","RESPECT","RESPOND","RESPONSE"
,"RESPONSIBILITY","RESPONSIBLE","REST","RESTAURANT","RESULT","RETAIN","R
ETURN","REVEAL","REVENUE","REVIEW","REVOLUTION","RICH","RIDE","RIGHT","
RING","RISE","RISK","RIVER","ROAD","ROCK","ROLE","ROLL","ROOF","ROOM","RO
UND","ROUTE","ROW","ROYAL","RULE","RUN","RURAL","SAFE","SAFETY","SALE","
SAME","SAMPLE","SATISFY","SAVE","SAY","SCALE","SCENE","SCHEME","SCHOOL",
"SCIENCE","SCIENTIFIC","SCIENTIST","SCORE","SCREEN","SEA","SEARCH","SEASO
N","SEAT","SECOND","SECONDARY","SECRETARY","SECTION","SECTOR","SECURE"
,"SECURITY","SEE","SEEK","SEEM","SELECT","SELECTION","SELL","SEND","SENIOR
","SENSE","SENTENCE","SEPARATE","SEQUENCE","SERIES","SERIOUS","SERIOUSLY
","SERVANT","SERVE","SERVICE","SESSION","SET","SETTLE","SETTLEMENT","SEVE
RAL","SEVERE","SEX","SEXUAL","SHAKE","SHALL","SHAPE","SHARE","SHE","SHEE
T","SHIP","SHOE","SHOOT","SHOP","SHORT","SHOT","SHOULD","SHOULDER","SHOU

T","SHOW","SHUT","SIDE","SIGHT","SIGN","SIGNAL","SIGNIFICANCE","SIGNIFICANT","SILENCE","SIMILAR","SIMPLE","SIMPLY","SINCE","SING","SINGLE","SIR","SISTER","SIT","SITE","SITUATION","SIZE","SKILL","SKIN","SKY","SLEEP","SLIGHTLY","SLIP","SLOW","SLOWLY","SMALL","SMILE","SO","SOCIAL","SOCIETY","SOFT","SOFTWARE","SOIL","SOLDIER","SOLICITOR","SOLUTION","SOME","SOMEBODY","SOMEONE","SOMETHING","SOMETIMES","SOMEWHAT","SOMEWHERE","SON","SONG","SOON","SORRY","SORT","SOUND","SOURCE","SOUTH","SOUTHERN","SPACE","SPEAK","SPEAKER","SPECIAL","SPECIES","SPECIFIC","SPEECH","SPEED","SPEND","SPIRIT","SPORT","SPOT","SPREAD","SPRING","STAFF","STAGE","STAND","STANDARD","STAR","START","STATE","STATEMENT","STATION","STATUS","STAY","STEAL","STEP","STICK","STILL","STOCK","STONE","STOP","STORE","STORY","STRAIGHT","STRANGE","STRATEGY","STREET","STRENGTH","STRIKE","STRONG","STRONGLY","STRUCTURE","STUDENT","STUDIO","STUDY","STUFF","STYLE","SUBJECT","SUBSTANTIAL","SUCCEED","SUCCESS","SUCCESSFUL","SUCH","SUDDENLY","SUFFER","SUFFICIENT","SUGGEST","SUGGESTION","SUITABLE","SUM","SUMMER","SUN","SUPPLY","SUPPORT","SUPPOSE","SURE","SURELY","SURFACE","SURPRISE","SURROUND","SURVEY","SURVIVE","SWITCH","SYSTEM","TABLE","TAKE","TALK","TALL","TAPE","TARGET","TASK","TAX","TEA","TEACH","TEACHER","TEACHING","TEAM","TEAR","TECHNICAL","TECHNIQUE","TECHNOLOGY","TELEPHONE","TELEVISION","TELL","TEMPERATURE","TEND","TERM","TERMS","TERRIBLE","TEST","TEXT","THAN","THANK","THANKS","THAT","THE","THEATRE","THEIR","THEM","THEME","THEMSELVES","THEN","THEORY","THERE","THEREFORE","THESE","THEY","THIN","THING","THINK","THIS","THOSE","THOUGH","THOUGHT","THREAT","THREATEN","THROUGH","THROUGHOUT","THROW","THUS","TICKET","TIME","TINY","TITLE","TO","TODAY","TOGETHER","TOMORROW","TONE","TONIGHT","TOO","TOOL","TOOTH","TOP","TOTAL","TOTALLY","TOUCH","TOUR","TOWARDS","TOWN","TRACK","TRADE","TRADITION","TRADITIONAL","TRAFFIC","TRAIN","TRAINING","TRANSFER","TRANSPORT","TRAVEL","TREAT","TREATMENT","TREATY","TREE","TREND","TRIAL","TRIP","TROOP","TROUBLE","TRUE","TRUST","TRUTH","TRY","TURN","TWICE","TYPE","TYPICAL","UNABLE","UNDER","UNDERSTAND","UNDERSTANDING","UNDERTAKE","UNEMPLOYMENT","UNFORTUNATELY","UNION","UNIT","UNITED","UNIVERSITY","UNLESS","UNLIKELY","UNTIL","UP","UPON","UPPER","URBAN","US","USE","USED","USEFUL","USER","USUAL","USUALLY","VALUE","VARIATION","VARIETY","VARIOUS","VARY","VAST","VEHICLE","VERSION","VERY","VIA","VICTIM","VICTORY","VIDEO","VIEW","VILLAGE","VIOLENCE","VISION","VISIT","VISITOR","VITAL","VOICE","VOLUME","VOTE","WAGE","WAIT","WALK","WALL","WANT","WAR","WARM","WARN","WASH","WATCH","WATER","WAVE","WAY","WE","WEAK","WEAPON","WEAR","WEATHER","WEEK","WEEKEND","WEIGHT","WELCOME","WELFARE","WELL","WEST","WESTERN","WHAT","WHATEVER","WHEN","WHERE","WHEREAS","WHETHER","WHICH","W

```
HILE","WHILST","WHITE","WHO","WHOLE","WHOM","WHOSE","WHY","WIDE","WID
ELY","WIFE","WILD","WILL","WIN","WIND","WINDOW","WINE","WING","WINNER","
WINTER","WISH","WITH","WITHDRAW","WITHIN","WITHOUT","WOMAN","WONDER
","WONDERFUL","WOOD","WORD","WORK","WORKER","WORKING","WORKS","WO
RLD","WORRY","WORTH","WOULD","WRITE","WRITER","WRITING","WRONG","YAR
D","YEAH","YEAR","YES","YESTERDAY","YET","YOU","YOUNG","YOUR","YOURSEL
F","YOUTH"]
letters = ["A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q",
"R", "S", "T", "U", "V", "W", "X", "Y", "Z"]
def wordscore(words):
  counter = 0
  namescorelist = []
  for i in words:
    for j in i:
      for k in letters:
        if j == k:
          counter += int(letters.index(k)) + 1
    namescorelist.append(counter)
    counter = 0
  return namescorelist

def compare():
  counter = 0
  wordscorelist = wordscore(words)
  trianglenumberlist = trianglenumberfinder()
  for i in wordscorelist:
    for j in trianglenumberlist:
      if i == j:
        counter += 1
      elif j > i:
        continue
  return counter
print (compare())
#43----------------------------------------------------------------------------------------------------------
The number, 1406357289, is a 0 to 9 pandigital number because it is made up of each of the
digits 0 to 9 in some order, but it also has a rather interesting sub-string divisibility property. Let
d1 be the 1st digit, d2 be the 2nd digit, and so on. In this way, we note the following:
```

d2d3d4=406 is divisible by 2, d3d4d5=063 is divisible by 3, d4d5d6=635 is divisible by 5, d5d6d7=357 is divisible by 7, d6d7d8=572 is divisible by 11, d7d8d9=728 is divisible by 13, d8d9d10=289 is divisible by 17. Find the sum of all 0 to 9 pandigital numbers with this property.

```
import itertools
def permutations(number):
        return list(itertools.permutations(number))
def makedividends(y):
  dividends = []
  x = 1
  while x < 8:
        dividends.append(y[x]+y[x+1]+y[x+2])
        x = x + 1
  return dividends
def checkdivisors(y):
  counter = 0
  divisors = [2,3,5,7,11,13,17]
  dividends = makedividends(y)
  for (i,j) in zip(divisors, dividends):
        if int(j)%i == 0:
        counter += 1
  if counter == 7:
        return True
  return False
answers = []
allpandigitals = permutations("1406357289")
for i in allpandigitals:
  string = ""
  for j in i:
        string += j
  if checkdivisors(string):
        answers.append(int(string))
total = 0
for k in answers:
  total += k
print (total)
```

#44----------

Pentagonal numbers are generated by the formula, Pn=n(3n−1)/2. The first ten pentagonal numbers are: 1, 5, 12, 22, 35, 51, 70, 92, 117, 145, … It can be seen that P4 + P7 = 22 + 70 = 92

= P8. However, their difference, 70 − 22 = 48, is not pentagonal. Find the pair of pentagonal numbers, Pj and Pk, for which their sum and difference are pentagonal and D = |Pk − Pj| is minimised; what is the value of D?

```
pentagon = []
for i in range (1001,9001):
  p = int(i *(3*i - 1)/2)
  pentagon.append(p)
#print (pentagon)
for first in pentagon:
  for second in pentagon:
    sumofnumbers = first + second
    difference = abs(first - second)
    if sumofnumbers in pentagon and difference in pentagon:
      print (first)
      print (second)
      print (abs(first-second))
      break
```

#45----------

Triangle, pentagonal, and hexagonal numbers are generated by the following formulae:

Triangle:	Tn=n(n+1)/2	1, 3, 6, 10, 15, ...
Pentagonal:	Pn=n(3n−1)/2	1, 5, 12, 22, 35, ...
Hexagonal:	Hn=n(2n−1)	1, 6, 15, 28, 45, ...

It can be verified that T285 = P165 = H143 = 40755. Find the next triangle number that is also pentagonal and hexagonal.

```
i = 2
k = 50000
pentagon = []
while i < k:
  p = int(i * (3*i - 1) / 2)
  pentagon.append(p)
  i = i + 1
j = 2
hexagon = []
while j < k:
  h = int(j * (2*j - 1))
  hexagon.append(h)
  j = j + 1
```

```
for a in pentagon:
  for b in hexagon:
    if a ==b:
      print (a)
```
#46----------
It was proposed by Christian Goldbach that every odd composite number can be written as the sum of a prime and twice a square.

$9 = 7 + 2\times1^2$

$15 = 7 + 2\times2^2$

$21 = 3 + 2\times3^2$

$25 = 7 + 2\times3^2$

$27 = 19 + 2\times2^2$

$33 = 31 + 2\times1^2$

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?

```
def primechecker(number):
    counter = 0
    for numbers in range(2, int(number**0.5)+1):
        if number%numbers == 0:
            counter += 1
    if counter == 0 and not(number == 0 or number == 1):
        return True
    return False
establishedupperlimit = 10000

def primenumbergenerator():
    primenumberslist = []
    for potentialprime in range(1,establishedupperlimit+1):
        if primechecker(potentialprime):
            primenumberslist.append(potentialprime)
    return primenumberslist
primenumbers = primenumbergenerator()
def perfectsquaregenerator():
    perfectsquareslist = []
    for number in range(1,establishedupperlimit+1):
        perfectsquareslist.append(number*number)
    return perfectsquareslist
perfectsquares = perfectsquaregenerator()
def oddcompositegenerator():
```

```
    oddcompositeslist = []
    for potentialoddcomposite in range(9,establishedupperlimit+2,2):
        if not(primechecker(potentialoddcomposite)):
            oddcompositeslist.append(potentialoddcomposite)
    return oddcompositeslist
def goldbachotherconjecture(number):
    for perfectsquare in perfectsquares:
        for prime in primenumbers:
            sumofprimeandtwiceasquare = prime + 2*perfectsquare
            if number == sumofprimeandtwiceasquare:
                return True
            if perfectsquare > number:
                return False
oddcomposites = oddcompositegenerator()
passedconjecture = []
for thomas in oddcomposites:
    if goldbachotherconjecture(thomas):
        passedconjecture.append(thomas)
def contradictionfinder():
    for (a, b) in zip(oddcomposites,passedconjecture):
        if a != b:
            return a
    return True

print (oddcomposites)
print (passedconjecture)
print (contradictionfinder())
#48----------------------------------------------------------------------------------------------------------
```

The series, $1^1 + 2^2 + 3^3 + ... + 10^{10} = 10405071317$. Find the last ten digits of the series, $1^1 + 2^2 + 3^3 + ... + 1000^{1000}$.

```
total = 0
for i in range (1,1001):
    for j in range (1,1001):
        if i == j:
            total += i ** j
x = str(total)
print (x)
print (len(x))
```

```
y = x[2991]+x[2992]+x[2993]+x[2994]+x[2995]+x[2996]+x[2997]+x[2998]+x[2999]+x[3000]
print (len(y))
print (y)
```
#49----------

The arithmetic sequence, 1487, 4817, 8147, in which each of the terms increases by 3330, is unusual in two ways: (i) each of the three terms are prime, and, (ii) each of the 4-digit numbers are permutations of one another. There are no arithmetic sequences made up of three 1-, 2-, or 3-digit primes, exhibiting this property, but there is one other 4-digit increasing sequence. What 12-digit number do you form by concatenating the three terms in this sequence?

```
def permutationchecker(a,b):
  a, b = str(a), str(b)
  if sorted(a) == sorted(b):
    return True
  return False
def primechecker(a):
  if a == 1:
    return False
  for i in range (2, int(a**0.5)+1):
    if a%i == 0:
      return False
  return True
for i in range (1000,10000):
  if i == 1487:
    continue
  elif primechecker(i):
    for j in range (1,10000):
      if permutationchecker(i+j, i):
        if primechecker(i+j):
          if permutationchecker(i+j+j, i):
            if primechecker(i+j+j):
              a = str(i)
              b = str(i+j)
              c = str(i+j+j)
              print (a+b+c)
```
#56----------

A googol (10100) is a massive number: one followed by one-hundred zeros; 100100 is almost unimaginably large: one followed by two-hundred zeros. Despite their size, the sum of the digits

in each number is only 1. Considering natural numbers of the form, ab, where a, b < 100, what is the maximum digital sum?

```
def digitsum(x):
  total = 0
  length = len(x)
  for i in range (length):
    digit = int(x[i])
    total += digit
  return total

numbers = []
for a in range (101):
  for b in range(101):
    numbers.append(str(a**b))
digitsumnumbers = []
for k in numbers:
  digitsumnumbers.append(digitsum(k))
digitsumnumberssorted = sorted(digitsumnumbers)
highestdigitsum = digitsumnumberssorted[-1]
print (highestdigitsum)
```

#92----------

A number chain is created by continuously adding the square of the digits in a number to form a new number until it has been seen before.

For example,

44 → 32 → 13 → 10 → **1** → **1**

85 → **89** → 145 → 42 → 20 → 4 → 16 → 37 → 58 → **89**

Therefore any chain that arrives at 1 or 89 will become stuck in an endless loop. What is most amazing is that EVERY starting number will eventually arrive at 1 or 89. How many starting numbers below ten million will arrive at 89?

```
def func(input, counter = 0):
    for digit in str(input):
        counter += int(digit) ** 2
    if counter == 89:
        return True
    elif counter == 1:
        return False
```

```
    else:
        return func(counter)
def main():
    counter1 = 0
    for i in range(1,10000001):
        if func(i):
            counter1 += 1
    return counter1
print (main())
#-------------------------------------------------------------------------------------------------------------
```

Efficient Factor Finder

```
def factors(x):
  res = []
  res2 = []
  for i in range(1,int(x**0.5)+1):
    if x%i == 0:
      res.append(i)
  for j in res:
    y = x/j
    if y != j:
      res2.append(int(y))
  res += res2
  res.sort(key=int)
  if len(res) == 2:
    print (x, "is prime so the only factors are", res)
  else:
    print("The factors of", x, "are", res)
all_factors = factors(int(input("Enter a number")))
```

Potential 75

```
upperlimit = 150
sidesupperlimit = int(upperlimit/2)
perimeters = []
for a in range (1,sidesupperlimit):
```

```
  for b in range (1,sidesupperlimit):
    for c in range (1,sidesupperlimit):
      if c**2 == a**2 + b**2 and b > a and c > b:
        p = a + b + c
        if p <= upperlimit and p >= 12:
          perimeters.append(p)


perimeters = set(perimeters)
print (len(perimeters))
```

Potential # 46

```
def factors(x):
  res = []
  res2 = []
  for i in range(1,int(x**0.5)+1):
    if x%i == 0:
      res.append(i)
  for j in res:
    y = x/j
    if y != j:
      res2.append(int(y))
  res += res2
  res.sort(key=int)
  return res

def primechecker(x):
  if len(factors(x)) == 2:
    return True
  return False

def squarechecker(x):
  if int(x**0.5) * int(x**0.5) == x:
    return True
  return False

answers = []

x = 100
```

```
y = 100000000000
for i in range (1,y):
  if i%2 != 0:
    if not primechecker(i):
      for j in range (1,i):
        if primechecker(j):
          a = i - j
          if squarechecker(a/2):
            answers.append(i)

answers = sorted(answers)
answers2 = set(answers)

for i in range (x,y):
  if i%2 != 0:
    if not primechecker(i):
      if i not in answers2:
        print (i)
        break
```