**SMALLEST NUMBER WITH GIVEN NUMBER OF DIVISOR:**

#include <iostream>

using namespace std;

int n, i, j, k;

bool ok;

int pr[100];

long long ans;

long long f(long long res, int pp, int deg)

{

long long zz = res;

for (int i = 1; i < deg; i++)

{

zz = zz \* pp;

if ((zz % pp != 0) || (zz / pp != res))

{

return -1;

}

res = zz;

}

return res;

}

void doit(int m, int i, int up, long long res)

{

long long zz;

if (i == 10)

{

if (m > up) return;

zz = f(res, pr[i], m);

if (zz < 0) return;

if (ans < 0) ans = zz;

else if (ans > zz) ans = zz;

}

int j = 2;

while ((j \* j <= m) && (j <= up))

{

if (m % j == 0)

{

zz = f(res, pr[i], j);

if (zz > 0) doit(m / j, i + 1, j, zz);

zz = f(res, pr[i], m / j);

if ((zz > 0) && (m / j <= up)) doit(j, i + 1, m / j, zz);

}

j++;

}

if (m <= up)

{

zz = f(res, pr[i], m);

if (zz < 0) return;

if (ans < 0) ans = zz;

else if (ans > zz) ans = zz;

}

}

int main()

{

cin >> n;

for (i = 2; i <= 100; i++)

{

ok = true;

for (j = 2; j \* j <= i; j++)

{

if (i % j == 0) ok = false;

}

if (ok)

{

k++; pr[k] = i;

}

}

ans = -1;

doit(n, 1, n, 1);

cout << ans;

//cin >> n;

return 0;

}