Name: Shreeshail Mahajan
PRN: 2020BTECS00055
Batch: B4

Prime Factorisation

Code:

```cpp
#include <bits/stdc++.h>
using namespace std;
typedef long long ll;

ll gcd(ll a, ll b) {
    if (b == 0) return a;
    return gcd(b, a % b);
}

ll pollard_rho(ll n) {
    ll x = 2, y = 2, d = 1;
    while (d == 1) {
        x = (x * x + 1) % n;
        y = (y * y + 1) % n;
        y = (y * y + 1) % n;
        d = gcd(abs(x - y), n);
    }
    return d;
}

void factorize(ll n) {
    if (n <= 1) return;

    if (n % 2 == 0) {
        cout << 2 << " ";
        while (n % 2 == 0) n /= 2;
    }

    while (n > 1) {
        ll factor = pollard_rho(n);
        cout << factor << " ";
        while (n % factor == 0) n /= factor;
    }
}

int main() {
    ll n;
    cin >> n;
    factorize(n);
    return 0;
}
```

Screenshot:

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```
g++ prime_factors.cpp -o prime_factors } ; if ($?) { .\prime_factors }
777777777778888888888888888888899999999999999944444444444555555555566666666666666111111111122222
21
7 73 127 337 92737 649657
PS F:\D drive\0Walchand_Sem7\CNS lab\LA2>
```