

FAST, LHR(Mid-term Exam PF 1B_{v2})

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Student Name	Roll No	Section	Q1 Marks	Q2 Marks	Total Marks
			20	20	40

NOTE:

You are not allowed to use Lists/Arrays/Vectors etc

Given Code

factorial functions for Q1

- Use this code for Q1
- 3! can be written as *fac(3)*

```
#include <iostream>
#include <iomanip>
using namespace std;

long long int fac(unsigned int n){
    if (n > 0) return n * fac(n-1);
    else
        return 1;
}

int main(int argc, char *argv[])
{
    // following two lines are only for testing purpose
    // you can use remove them
    int x = fac(3);
    cout << x << endl; // 6

    float result = 0.12345;
    cout << fixed << setprecision(2) << result << endl; // 0.12
    // code your Q1
    return 0;
}
```

Set precision to 5 decimal

let $x = 0.12345$

- if precision is to 2 decimal places, then x will be 0.12
- `cout << fixed << setprecision(2) << number << endl;`

Q1

Estimate $f(0.5)$ (marks: 20)

- $f(x)$ till 5 terms just for pattern purpose
- But you will use 20 terms to estimate $f(0.5)$

$$f(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \dots$$

Replace x with 0.5 and follow the pattern

e.g $f(x)$ till 5 terms

$$f(0.5) = 1 - \frac{0.5^2}{2!} + \frac{0.5^4}{4!} - \frac{0.5^6}{6!} + \frac{0.5^8}{8!} - \dots$$

If you increase the number of terms, e.g, 7,
then $f(0.5)$ will have more accurate result as compared to 5 terms

Print the final value of $f(0.5)$ to 5 decimals

`cout << fixed << setprecision(5) << result << endl;`

Continue

Q2 (sum of first 50 terms)

Namikaza Series (Marks: 20)

- 1st term: 1
- 2nd term: 1
- 3rd term: 1
- nth term: sum of previous all odd terms if n is even
- nth term: sum of previous 2 even terms if n is odd

First 7 Terms and theirs sums

nth Term	term	sum of nth terms
1 st	1	1
2 nd	1	1+1= 2
3 rd	1	1+1+1=3
4 th	4 is even: 1 st + 3 rd = 1 + 1 = 2	1+1+1+2=5
5 th	5 is odd: 2 nd + 4 th = 1 + 2 = 3	1+1+1+2+3=8
6 th	6 is even: 1 st + 3 rd + 5 th = 1 + 1 + 3 = 5	1+1+1+2+3+5=13
7 th	7 is odd : 3 rd + 5 th = 1 + 3 = 4	1+1+1+2+3+5+4=17

Find sum of first 50 terms of Namikaza Series