

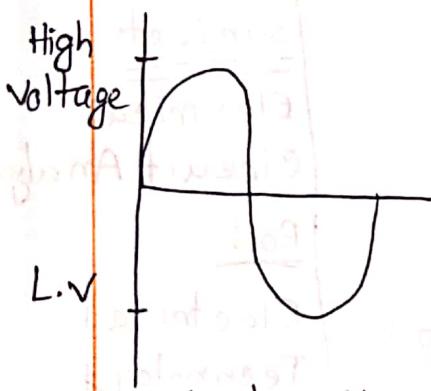
Introduction

2M

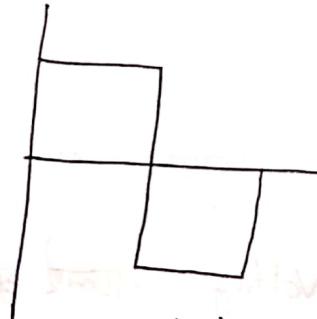
$$\begin{array}{r}
 \text{Divided} \\
 \overline{2 \Big| \begin{array}{r} 2 \\ 2 \\ 1 \end{array}} \quad (2)_{10} = (10)_2 \\
 \begin{array}{r} 2 \\ -2 \\ \hline 1 \end{array} \quad \begin{array}{r} 0 \\ -0 \\ \hline 1 \end{array} \\
 \text{Divisor} \qquad \qquad \qquad \text{Reminder}
 \end{array}$$

(କୋମନ୍ଟ)

```
graph TD; Computer[Computer] --> Base[Base]
```



Analog Signal



Digital signal

2020
(→) 201

$$\begin{array}{r}
 \text{1010} \\
 \text{1's complement} \\
 \downarrow \\
 \text{0101} \\
 (+) \quad \text{101} \\
 \hline
 \text{1010}
 \end{array}$$

↗ 1's complement
 ↗ 1's complement

$(0101)_2$ [Ans]

Scanned with CamScanner

Assembly Language:

B, C (ଜ୍ୟୋତିର)

→ ADD A, B, C

B ଓ C ଯୋଗ

କଣ୍ଟ

A ତେବୁଥିବା

Programming in ANSI (Indian Writer)

Codeblocks

(ଫିଲେଟ୍)

SPL (Structured Programming Language)

2M

Instruction:

Program:

Software: is a collection of programs.

input:

instruction

$$\text{Score} = \underbrace{\text{S.S.C} * 2.8}_{\text{single task}} + \underbrace{\text{H.S.C} * 3.2}_{\text{single task}}$$

print
total score = "Score"

Program

ଏହାକୁ Program
ଏହା collection → software

C Programming:

i) Documentation Section → Software ଓ Basic information section (version, writer)

These are not part of program.
Execute ହେଲ୍ତିଲା। Just information
ଦେଖାଯାଇବା କୁଳାରୀ

ii) Link Section: Library function এখানে মার্গিতে input ও output এর মাঝে Link করা হয়।

include <stdio.h>
standard input output
printf("I am a student");

include <math.h>
mathematical terms
Link section.

iii) Definition Section: Globally কিছি variable

iv) & Global declaration: declare করে রাখতে পারি।

ক্ষেত্র: # define PI 3.1416
global user defined [value নির্দিষ্ট
const. declare]
int add(int a, int b) [Just declare করে
রাখলাম]
predefined by user.

v) main function: ~~void main()~~ ~~int main()~~ ~~float main()~~ ~~double main()~~
parenthesis must

void main ()

int main ()

main is function so {} of parenthesis.

error 1

{

declaration section

execution section

#define

pi 3.1416

define keyword

from file pi.h

circle area

{ pi=3.1416 } → no need,

if it was

predefined

sphere area

$$\{ \pi = 3.1416$$

area } output after entering
; (d2, pi) func

angular area

$$\{ \pi = 3.1416$$

area } output after entering
; (d2, pi) func

very first Program: 2nd input for summation

output

```
#include <stdio.h>
int void main()
{
    return 0; // function end
}
int a, b, c;
```

Diagram illustrating variable types and memory layout:

- The variable `a` is labeled as `integer`.
- The variable `b` is labeled as `integer`.
- The variable `c` is labeled as `integer`.
- The label `seperator` points to the space between the variable declarations.
- The label `function` points to the `main()` function definition.
- The label `return 0` points to the `return 0;` statement at the end of the function.

```
printf("Enter the value of a:");
scanf("%d", &a);
```

scanf("%d")
input from user

input to variable a to store

scanf("%d", &a);

input from user to variable a

printf("Enter the value of b:");

scanf("%d", &b);

b का value निये b को store करो

c = a + b;

a और b को योग करो c को store
करो c को

printf("The sum is: %d", c);

printf("%d" का output
value प्रदर्शन करो

return 0;

}

तोले किछु return करो

Compiler: (जग्याचे source code execute विच)

Program ला प्र० फॉरम रुप → source code

Compiler का कागः

source code → convert to object code
(Machine language)

Interpreter:

One by one line source code execute विच

① Computer Fundamentals - Any written

input device

→ processing

output device

Human readable →

Machine readable form

Machine readable →

Human readable form

~~Z M Sir~~

SPL

Constant & Variable

Character set

i) Letters \rightarrow A-Z, a-z

ii) Digits \rightarrow 0-9, 0-1, 0-7, 0-9 & A-F

iii) Special symbol / character \rightarrow #, \$; & ()

iv) white space

(Non-positional: Roman number)

Positional: Position एवं value वाले

2+3(i) \rightarrow positional number
एवं suffix.

375, -375, +375 \rightarrow Decimal

0375 \rightarrow Octal

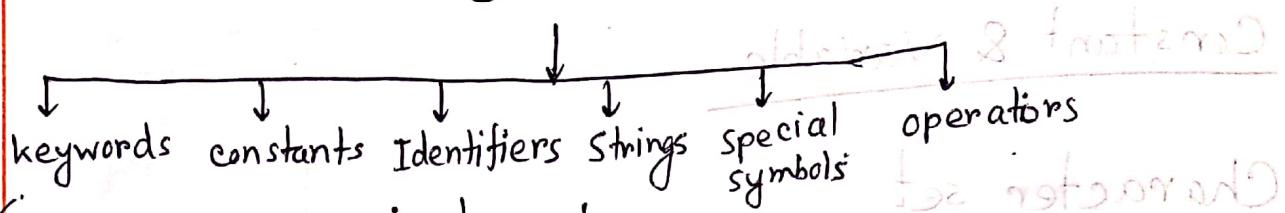
0x375 \rightarrow Hexa-decimal

Programming
एवं संश्लेषण compiler
एवं आलोचना represent

प्रगति अनुकूल

नियन्त्रण के अंतर्गत numbers (A)
एवं एक एक प्रकार के numbers (B)

C Tokens



c ते पूर्व घेलो

set का देखा था।

अन्य किछु हियाए रखाए

रखा याए ना।

Unchanged meaning

Exmp: int, char,
break, do, if,

else, for, return

switch, void.

एशनार्ट वार्ड

नाम हियाए रखाए का

याए ना।

~~कम्पिटर~~ compiler

आर्म de fine का

हाए।

user defined

Exmp: $\pi = 3.14$ → single
@b, c variable

sum()

P[100]

a[100]

a गोटप्रे

प्र० 100 वा

variable.

[Details: array]

function

array -

अन्य गोरुता।

x, y, z

Identifiers एवं अन्य शब्द सर्वांगीकृत हो।

a1 ✓
1 a X

i) Start with alphabet: A-Z, a-z, 0-9, _ → (underscores)

ii) maximum length: 31 character

iii) keyword ते राखाए रखाए का याए ना।

iv) identifier എംബെൻ (single identifier) white space അല്ലെന്ന്

Rahim ✓ R ahim ✗

Constants:

Execution time / running time എംബെൻ value remain unchanged.

Exmp: $c = 5 * a;$

↳ എംബെൻ value

ക്രമം മാറ്റുമ്പോൾ running time എംബെൻ

Constants

Integer
(ഇംഗ്രേസ്റ്റ്)

fractional part അല്ലെന്ന്

0-9 (+, -)

0-7 (0)

0-9, A-F (0x)

Real
75.75

212.37

3×10^9

$3e9$ (programming)

3.1×10^{-7}

$3.1e-7$ (programming)

Exponent

↓

(Never be fractional)

$3.1 \times \sqrt{10}$
 3.1×3.3
 9.132×10^{-2}
 $9.132 e^{-2}$

character
'a' 's'
single character

Mantissa

Strings: Collection of characters

"MD. RAHIM"

for character

space.

double quote "

for !

'97' '97'

character

single quote '

Backslash

\n → new line

\t → tab

\b → back space

\? → question mark

\0 → null

Operators:

i) mathematical: + - × ÷

ii) logical: OR, NOT, AND, a||b, a&&b

iii) conditional: < > ≤ ≥

SPL

Variables:

প্রত্যেক টেক্সট ক্ষণের জন্য user defined ~~বাবা~~ নাম।

variables should be closed with nomenclature.

এতে সুষ্ঠু হচ্ছে।

int a, b, c; নামের int a, b, sum; মিথ।
 (যোগ প্রোগ্রাম)

Latest compiler:

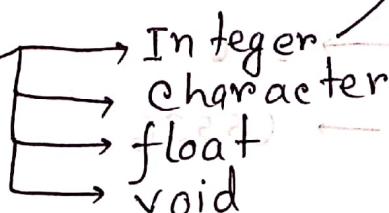
identifier দ্বারা সুস্থিত হতে পারে।

63টি character দ্বারা হতে পারে।

identifier Variables case-sensitive.

Data types:

- i) Primary
- ii) Derived
- iii) User-defined



192

Integer:

i) max 2 bytes / 16 bits

ii) -32,768 to 32,767 { programming }

→ integer

same → unsigned integer → 0 to +65,535 (Range)

→ signed integer

→ Range → (-32,768 to 32,767)

Character:

i) byte / 8 bit

ii) -128 to 127

Byte unsigned 2⁸, 256

Range 0 to 255

0 to +255

1 bit → 2¹ → 0 or 1.

$$2^8 \rightarrow 256$$

$$2^{16} \rightarrow 65536$$

bits

format (a)

যদি এর চেয়ে কোরি range প্রয়োজন হয় তবে,

long int (এর range double হলু যাব)

আগের /maximum long long int.

But character ক্ষমতা

~~Long char~~

হলু না।

Length বাস্তবের ক্ষেত্রে Array প্রয়োজন হাতে।

float (fractional number input নথীর জন্য)

i) 32 bit

ii) Range: [3.4 E -38 to 3.4 E 38]

এই চেয়ে ফিল্ট রেঞ্জ প্রয়োজন হলে,

double → 64 bit

range → [-1.7 E -308 to 1.7 E 308]

এই চেয়ে ফিল্ট প্রয়োজন হলে,

long double → 128 bit

range → [3.4 E -4932 to 3.4 E 4932]

void (to set the return type of function)

int main() → गलियारा return type → true/false

void main()

→ को return type → 1

variable declaration:

int a, b, sum; → नामों must come in a line

separate by comma.

char p, q, r;

float m, n, y;

int s = 12;

int sum = a + b;

int sum = a * b;

i) Global declaration: एकलांगो ग्राहण करते हुए

शाअ Program के बाहर आउने

ii) Local declaration: सॉफ्टवेर के ग्राहण करते हुए

Program के अन्ति विद्युत आवेदन के लिए

ग्राहण करते हुए के अवधारणा के लिए जैसा है।

#include <stdio.h>

int p;

int main()

{ int r; } → (local declaration)



user द्वारा लिये गये input की विवरण

scanf ("%d", &a);

की type
हो data अंतर्गत
integer type

scanf ("%f", &y);

floating type data
input हो

scanf ("%c", &p);

character
type input

scanf ("%s", &h);

string type
data input

long integer

“%ld”

long float

“%.lf”

Long double

“%.ld”

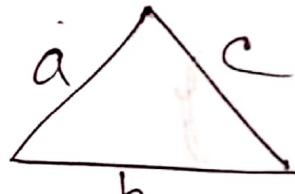
“%.ll”

Area of triangle:

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

$$2s = a+b+c$$

$$s = \frac{a+b+c}{2}$$



Ans:

include <stdio.h>

~~# include <math.h>~~ # include <math.h>

int ~~void~~ main()

{
float a,b,c,s, area;

printf ("Enter the value of a:");

scanf ("%f", &a);

```
printf("Enter the value of b:");
```

```
scanf("%f", &b);
```

```
printf("Enter the value of c:");
```

```
scanf("%f", &c);
```

~~s = a + b + c~~:

```
or, printf("Enter the value of a, b, c:");
```

```
scanf("%f %f %f", &a, &b, &c);
```

$$s = \frac{(a+b+c)}{2}$$

$$\text{area} = \sqrt{s * (s-a) * (s-b) * (s-c)};$$

↳ (math.h) ↳ মাত্রিক

```
printf("Enter Area of the triangle is: %f", area);
```

```
return 0;
```

```
}
```

~~s has s - typecast to double for float~~
~~H.T; i) 2 float input (double, float, float, float)~~
[User ক্ষেত্রে কৃতি এবং if ফলো করুণ]

ii) a, b, c to calculate
$$x = \frac{a}{b-c}$$

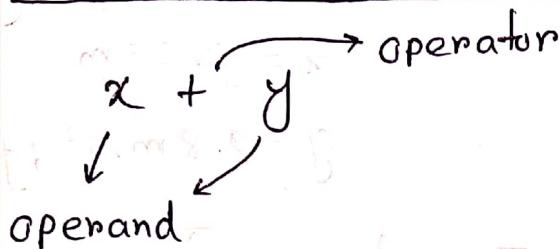
iii) km drive total
many days ~~will~~ will

iv) average
of ~~an~~ numbers.

Can I have a ^{small} sandwich, please?

ZM

Operators and Expressions:



i) Arithmetic operator:

$$50/8 = 6 \quad (\text{int})$$

$$50 \% 8 = 2 \quad (\text{Reminder})$$

ii) Relational operator:

Compare args, final decision \rightarrow output

< → less than

\leq → less than or equal

> → greater than

\geq → greater than or equal

$=$ → equal

$!=$ → not equal

$5 < 3 \rightarrow \text{False} / 0 / \text{No}$

$3 < 5 \rightarrow \text{True} / 1 / \text{Yes}$

$5 < 5 \rightarrow \text{False} \quad 5 \leq 5 \rightarrow \text{True}$

$a == b$

'a' assign to 'b'

$a = 5$

assignment operator

$5 < (2 + 3) \rightarrow$

'a' assign to '5'

iii) Logical operator

$\&\&$ → logical AND

$||$ → logical OR

! → logical NOT

$a == b || c != d$

$\Rightarrow 5 == 10 || 5 != 12$

\Rightarrow False || True

\Rightarrow True

$a < b \&\& c < d$

$\Rightarrow 6 < 10 \&\& 5 < 12$

True && False → False

False True

$a = 6$

$b = 10$

$c = 5$

$d = 12$

$\begin{array}{r} 100111 \\ (-) 11010 \\ \hline \end{array}$

2's com रूपान्तर

program (

logical NOT रूपान्तर

2's com रूपान्तर

program (

abc || c > d
⇒ 6 < 10 || 5 > 12
⇒ True || False
⇒ True

* #include <stdio.h>

int main()

{ int age;

char P;

printf ("Enter age: ");

scanf ("%d", &age);

if (age > 55)

{

printf ("The man is old.");

}

else

printf ("The man is young.");

return 0;

}

$$ax^2 + bx + c = 0 ; \quad d = b^2 - 4ac$$

$d < 0 \rightarrow$ imaginary root

$$d > 0 \rightarrow \left\{ \begin{array}{l} r_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \\ r_2 = \end{array} \right.$$

$$d == 0 \rightarrow \left\{ \begin{array}{l} r_1 = \\ r_2 = \end{array} \right.$$

if ($d < 0$)

else if ($d > 0$)

else

for condition

ZM

Increment-decrement operator:

20/01/2020

$$1 \\ 1 + 1 = 2$$

$$2 + 1 = 3 \\ 3 + 1 = 4$$

$++$ operator \leftarrow $b = b + 1$

increment

operator (এখন এক কাটে রাখো)

$-$ \rightarrow decrement

operator (এক এক কাটে রাখো)

for ($i = 1; i \leq 20; i++$)

i এর starting point

ending point

$m = m + 1$

short form
 ~~$m = m + 1$~~

অথবা,

$i = 1;$

while ($i \leq 20$)

loop এর মেছে

কাখনও semicolon

হচ্ছে না।

{ printf ("Name=%s", name);
i++
}

printf গাঢ়িতে যাবার না এই condition
কর্তৃ হচ্ছে।

$i = 2 \rightarrow \text{start}$

$i = 2$

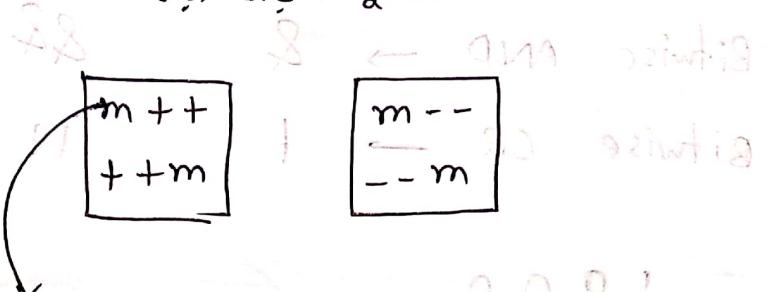
\dots

\dots

$i = 20 \rightarrow \text{end}$

$m++$ एवं $++m$ एकहीलागे रूपमें

रखा याएँ। इन्हें value एकीलागे रूपमें याच।



प्रथम m को value assign, then increment

प्रथम increment, then m को value assign.

$m = 5;$

$y = m++ \rightarrow y = 5 \rightarrow \text{next step } \Rightarrow y = 6$

$y = ++m \rightarrow y = 6$

प्रथम 1 को m में

Conditional operator:

$\text{exp1 ? exp2 : exp3}$

$P=(age < 55) ? "Young" : "Old";$

↓
condition

↓
मज़ शब्द

↓
मिल शब्द

single condition
एक जून
:(D) to :){:z

Result = (Mark ≥ 90) ? 'Pass' : 'Fail';

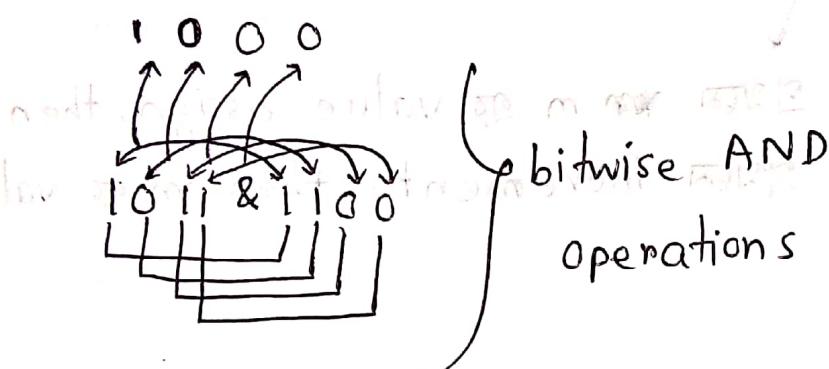
Bitwise Operator

Bitwise AND \rightarrow &

Bitwise OR \rightarrow |

&&

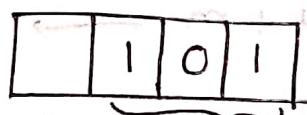
||



a = 10 a = 10 a = 10 ++a = 11

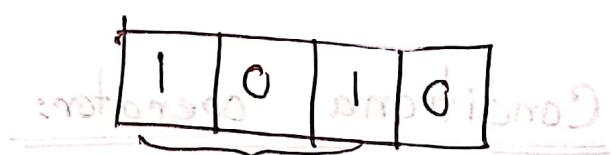
<< \rightarrow left shift

>> \rightarrow right shift



ফল কেন্দ্রে ০

অঙ্গ প্রয়োগ
কর



left shifting

int a;

a = 10 ;

size of(a);

\hookrightarrow a variable in memory

তে তার পরিষ্কার জায়গা বিলুপ্ত।

$$\# p = (a+b) > (c+d)$$

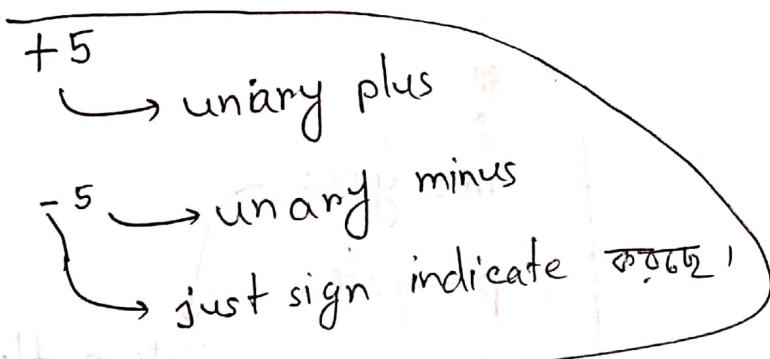
+5

→ unary plus

-5 → unary minus

just sign indicate

$$\# x = p * q + r - z$$



header file <math.h>

floor(a); } fractional nearest integer ↗
ceil(a); } convert ↗

$$a = 5.5$$

$$\text{floor} \rightarrow 5$$

$$\text{ceil} \rightarrow 6$$



Absolute

$|x-y|$ → All time positive value

`fabs(a)` → taking a float & making it positive

10^5

x^y

pow(10,5); pow(x,y);

int x,m;

float y;

float p;

int m;

$m = y/x;$

$p = y/x;$

int 3, float

enum class

float 260, float

float 260 size 4

convert int - double

enum class double

convert 260

int x,y;

float p;

$x=10;$

$y=3;$

$p = \underline{\text{int}} x/y;$

result integer;

or, $p = (\text{float})x/y;$

x,y float \rightarrow convert 260

output \rightarrow float 260

ZM
Power \$250 X

n₁ + n₂
operator

expression

Identifier

Row 1 ✓

Minimum ✓

2nd X

Total_number ✓

Total-number X

(forget)

{(x+tv) $\frac{\pi}{R}$ air - (x-tv) $\frac{\pi}{R}$ air} n

~~((x+tv+x-tv) $\frac{\pi}{R}$ air)~~ $\frac{\pi}{R}$ air? n

$\# a=5$
 $b=3$
 $c=10$
 $d=25$

$a > b \&& c < d$
 $5 > 3 \&& 10 < 25$ ✓
 $1 / \text{True} \&& 1 / \text{True}$
 $1 / \text{True}$

✓ ✓

$a > b \&& c < d$

ଏହା ଲାଗୁ ଯାଏ X

କିମ୍ବା

ଆଜି relational operator

ଏହା ଲାଗୁ ହେବା!

ଫିନାର୍ଟୋ → y, & m, d w, d

ଡାକ୍ତର୍ମାର୍ଗ → 1000, 500, 100,

(*) Problem:

Output:

6 5 3 2 8

6 5 3 2

6 5 3

6 5 3 2 8

6 5 3 2 8



```

while (a>0)
{
    printf ("%d\n", a);
    a=a/10;
}

```

[10 ଦ୍ୱାରା କାରାତି ହାଲ, integer

data type କିମ୍ବା ହାଲନା 0

କାହିଁ]

(*) Problem:

input: 1 2 3 4 5 6 7 8

(12345678)

output: $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8$

variable:

int a, c = 0; ~~for loop~~

c = a % 10;

~~c = 2348 % 10~~

a = a / 10;

c = c % a + 10;

$$\begin{aligned}2 \cdot 1 \cdot 10 &= 2 \\2 / 10 &= 0\end{aligned}$$

Looping until $a = 0$

c = 2348 % 10

= 8

c = 2348 / 10

= 234

c = 234 % 10 = 4

~~add 3~~ \oplus

a = a / 10 = 234 / 10

= 23

c = 12 + 3 = 15

c = 15 + 12 % 10 = 15 + 2

a = 2 / 10 = 0

or while ($a > 0$) $\xrightarrow{\text{condition}}$

```

    {
        c = c + a % 10 c + a % 10;
        a = a / 10;
    }
    printf ("");

```

executable part
depends on condition.

a, b, c কেন্দ্রীয় হয়?

int a, b, c;

scanf (

if ($a > b \&& a > c$)

printf ("a");

else if ($b > a \&& b > c$)

printf ("b");

else

printf ("c");

alternate: (রেস)

5, 3, 8, 9, 17

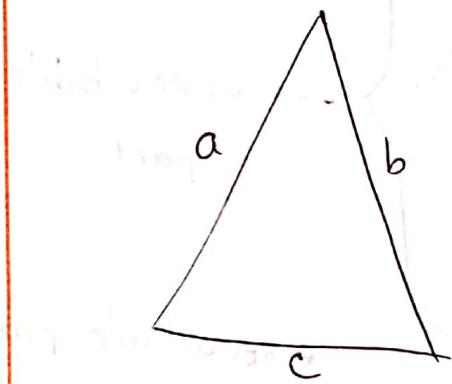
পুরুষ Large এবং স্বত্ত্বাল

মামল আমল পুরুষ Large

change এবং কার্য Large

printf.

প্রুজি মানিশ কি সা



or 11 ফিট

6/

⇒ char a;

header
file
<stro.h>

{ getchar (a); } → single character input
like scanf ("%d")

{ putchar (a); } → single character output
like printf ("%d")

* printf ("a=%d"); a (%d) + A/B/C/a/b/

Rahim X

:(" ") multiple ক্ষেত্র যাবেন।

Q# char a; \rightarrow if character
scanf ("%c", &a); \rightarrow multiple character input

scanf ("%5c", &a); \rightarrow Tamim \rightarrow 5 character input

base case \downarrow single character
store input data
normally range 255

input data or check for character after alphanumeric for alphabet input function

char P;

scanf ("%d%c", &P);

isalpha(P);

\rightarrow right \rightarrow True return

wrong \rightarrow false return

int b

integer \Rightarrow ~~char~~, is digit (b)

uppercase \leftarrow isupper()

lowercase \leftarrow islower()

combination - ③ ~~only one~~ \rightarrow ~~char~~ \rightarrow (char)

char p

~~scanf ("azad", &p);~~

↓
input: AZAD \Rightarrow uppercase \Rightarrow printout

toUpper (p);

printf ("%c", p);

→ output: AZAD

int char p;

getch (p);

printf ("d", &p);

→ respective input \Rightarrow ASCII
~~printout~~

'A'

↳ single quotation ↳

use ~~as~~ ASCII print ~~not~~ |

Soft Lab

অসমি
কুমি
কুমি

রিজার্স
জোড়
জোড়

ৰংগুল
যোগফল

$$\# \quad 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots$$

$\downarrow n$ $\downarrow n$ $\downarrow n$ $\downarrow n$ $\downarrow n$

$$i = 1;$$

$$\text{sum} = 0$$

$$\text{sum} = \text{sum} + \frac{1}{i};$$

$$\# \quad 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$$

$$\# \quad 1 + \frac{1}{2} + \frac{2}{4} + \frac{3}{6} + \frac{4}{8}$$

~~for~~ $i = 2$

~~for~~ $j = 2$

sum = sum + $\frac{i}{j}$

$i = i + 1;$

$j = j + 2;$

ZM Conditional Operator:

$(a < b)$? 0: 1
 ↓
 conditional {
 না ইটল
 যত্থ ইটল

~~1st type~~

```
# if (a % 2 == 0)
    printf ("Even");
else
    printf ("Odd");
```

while ($a < 0$)
~~printf ("")~~

~~2nd type~~

if ($a > b$)

{

মনে হল (কোটি) execute হবে।

}

ফলে { condition }
করা হবে।

মিথ্যা হল কিছুই হচ্ছে না।

~~3rd type~~

General form

if (Condition - 1)

{

statement

}

("block") thing

but
else if (Condition - 2)

{

statement

}

else if (Condition - 3)

{

statement

else

{
 statement

→ [condition match
 না করে]

1. Red

2. Green

3. Blue

4. Yellow

5. Black

```
int c;  
scanf ("%d", &c);
```

```
if (c == 1)  
    printf ("Color: Red");
```

```
else if (c == 2)  
    printf ("Color: Green");
```

```
else if (c == 3)  
    printf ("Color: Blue");  
  
else if (c == 4)  
    printf ("Color: Yellow");
```

Else if ($c == 5$)
printf ("Color: Black");

else
printf ("Wrong input.");

ফল এবং অবশ্যে

→ else printf ("Color: Black"); } এমন (1-9)
গাদে পেতেন
হোয়া input মিল
নি Green দেখতো।

Switch statement

switch (expression) {
 switch (expression) {
 case value:
 statement_1
 break;
 case value:
 statement_2
 break;
 :
 }

($c == 1$) {
 if (c == 1)
 printf ("Red color");
 else if (c == 2)
 printf ("Green color");
 else if (c == 3)
 printf ("Yellow color");
 else if (c == 4)
 printf ("Blue color");
 else if (c == 5)
 printf ("Black color");
 else
 printf ("Wrong input.");
}

default:
statement

}

1. Read sum

2. Write Sub

3. Read & Write Mul

4. Exit DN

#Result calculation

id+obj

char and float

int

↓

printf ("Press 1 to read: /n

Press 2 to write: /n ...

... Press 4 to exit.");

int a, b, c;

scanf ("%d", &a);

switch (a)

printf (

{ case 1:
printf ("

:(b , "b is %d") float

char

int

double

long

short

void

float

double

long double

char

int

double

float

int a, b, ~~c~~; d; ^{for} description fho,
scanf ("%d %d %d", &a, &b, ~~&c~~); ^{for} press 1 for..
switch (c)

{

case 1:

d=a+b;

printf ("Sum = %d", d);

break;

case 2:

d=a-b;

printf ("Sub = %d", d);

break;

case 3:

d= a*b;

printf ("Mul = %d", d);

break;

case 4:

~~d = a/b;~~

printf ("div = %d", d);

break;

default:

printf ("Error Entry.");

break;

}

#

100 — 10
90 — 9
80 — 8
70 — 7
60 — 6
50 — 5
40 — 4

30 []
20 []
10 []

10 stat
JLR stat
case stat

switch (a)

$$3 = \frac{a}{3} + \frac{ab}{15}$$

$$\frac{2}{3} = \frac{a}{9} + \frac{ab}{15}$$

$$\frac{3}{2} = \frac{a}{3} + \frac{ab}{15}$$

$$\frac{a-23}{28} = \frac{ab}{15}$$

ZM Lab

05/02/2020

$$1+2+3+4+\dots+n$$

$$1+3+5+7+\dots+(2n-1)$$

$$1+2+3+4+\dots+2n$$



$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{n}$$

$$1 + \frac{1}{3} + \frac{1}{5} + \dots + \frac{1}{2n-1}$$

$$1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2n}$$

1 extra

1 extra

initial sum = 1

LSD (Least significant value)

Problem:

4 5 6 2 8

D = 5

MSD (Most significant value)

Output:

$$4 + 8 = 12$$

LSD + MSD

ZM

```
# while ()      # while()      # do
:
        {
    do {
        }
    }
}
while()
```

while ও do ... while এর নথন্য়।

⇒ do ... while এ দো অবস্থা যা আছে তা কম্পিউটে
র রাখে execute হবে।

i=5

do {

printf ("%d", i)

i++

→ ১য়ে execute হওয়ার পর

দেখো

while (i < 5)

→ condition মিথ্যা

for Loop:

```
for (initialization; condition; increment/decrement),
```

No
semicolon

```

#sum=0           initialization
if (i=2; i<20 && sum<100; i++) { i=i+1; n=n+1 }
{
    sum=sum+i;
}
}

# for (i=0, m=50; i<m; i=i+1, m=m-1)
{
    p=m/i;
    printf ("%f", p);
}

```

initialization condition increment

$i \text{ go value}$
 $\uparrow \frac{1}{\infty}$

$m \text{ go value}$
 $\uparrow \frac{1}{\infty} \text{ means}$

$i=0 \frac{1}{\infty},$
 $\frac{m}{i} = \infty \text{ (infinity)}$

$(0+5) + 50.0 + 50.0 = 125.0 \text{ means}$

Output: 50. 24.5. 16. 12.7, not assigned.

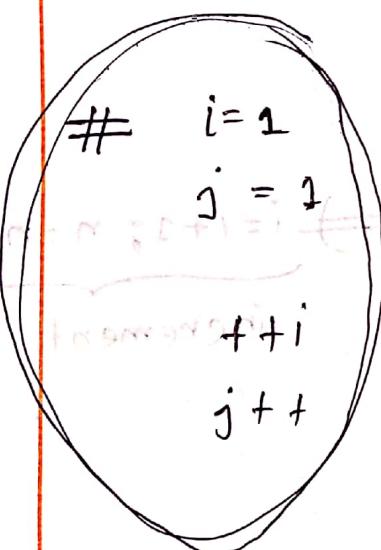
Q. 2

巢狀迴圈

nested loop: (loop 裏面有 loop)

previous problem.

```
printf ("%f", P);
if (P < 20)
    break;
```



Problem:

Pg: 138

Pay-bill

Emp. ID →

Emp. Level → 1 - 9

Basic Salary →

$$\text{House_Rent} = \text{Basic} * .25$$

Total

$$\text{Gross} = \text{House} + \text{Basic} + (\text{C} + \text{E})$$

Net-pay = gross - tax;

if (gross > 2000 && < 9000)

```
{ tax = gross * .03;  
}
```

Absolute Square

sqrt ~~root~~ द्वारा fractional value घटाकर नि

$$\sqrt{26} = 4$$

$$\sqrt{27} = 4$$

double p;

int n;

p = sqrt(n);

→ अमर्गु check द्वारा
(जो p fractional) or शून्य में नहीं

#float p;

int q;

int n;

p = sqrt(n)

q = sqrt(n)

if (p - q == 0)

absolute

else not

(गलत way)

```
# int n;  
float p;  
p=sqrt(n);
```

```
if ((ceil(p)==floor(p))
```

```
{ print
```

```
}
```

```
else
```

```
not
```

Cricket:

input: i) विकेट रान

ii) आमार एवं दूसरे खिलाड़ियों का रन

iii) आमार लड़ रन वाली गांवी जाति

* ब्रॉड?

bowl change या
मार खिलाड़ियों का data
change होता।

output: i) present run rate

(ii) required run rate.

- ① current run rate = current run / current over
- ② current over = current bowl / 6
- ③ required run rate = required run / remaining over;
- ④ remaining over = remaining bowl / 6
- ⑤

~~ZM~~ // ~~Problem~~

Number

0

Power of 2/3

$$2^0 = 1$$

1

$$2^1 = 2$$

2

$$2^2 = 4$$

3

$$2^3 = 8$$

4

$$2^4 = 16$$

5

$$2^5 = 32$$

6

$$2^6 = 64$$

7

$$2^7 = 128$$

~~// Multiplication table~~

continue statement

`break` → ମାତ୍ରିକ୍ଷରଣ କରି
`Loop` ରଖ

temporarily break
unit of code or skip

exit → program to
close अंत

continue යුතු වියේ නෑම execute නෑ

କାରେ ବାହୁର ଧୀର କଲେ ଯାଏ ।

problem. (continue page if necessary)

input: n (leftmost m bits)

Output: $\text{sqrt}(n)$

યદી 10^{th} સાંખ્યાક હોય તો તેના $(-)$ ve અંશ હશે | continue ફોર્મ
skip કરાયો।

```
int main () {
```

int n, count=0, i, p;

double r;

```
printf("Enter 999 to stop:");
```

while (count < 10)

```
{ printf("Enter number: ");
```

scant ("r. d", & n);

hythm

```

if (n == 999)
    break;
if (n < 0)
    printf("Negative input.");
i++;
continue;
}
r = sqrt(n);
printf("Number = %lf", r);
count++;
return 0;
}

```

translate numbers

loop finds repeat

then goes to for

then loops back

if true continue

if false go to loop

skip loop if

starting point in if

if true if

close loop if

Nested loop:

```

for (i=1; i<=n; i++)
    printf("\t");
}

```

by

2 1 1 2 2

(random test) nnnnnn

(as above) trace

for loop for

if testing for

1 1 1 1 2

2 2 2 2 2

3 3 3 3 3

(as true) 11111

n n n n n

$n=5$

Sol^m:

for ($i=1; i \leq n; i++$)

{

 for ($j=1; j \leq n; j++$)

 printf ("\t d", i);

 } printf ("\n");

}

$n=5$ ॥ ॥ ॥ ॥ ॥

loop

$i = 1$

$j = 1, 2, 3, 4, 5,$

= 1

= 1 + 1 = 2

= 1 + 1 + 1 = 3

= 1 + 1 + 1 + 1 = 4

= 1 + 1 + 1 + 1 + 1 = 5

1
1 2
1 2 1
1 2 1 2
1 2 1 2 1

Final output

2
2 2
2 2 2
2 2 2 2
2 2 2 2 2

$i = 2$

$j = 2$

= 2 + 2 = 4

Do print j ॥ ॥ ॥

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

2 2 2 2

2 2 2 2 2

Same problem

```
for (j=1; j <= i; j++)
```

```
{ printf ("%d", j); }
```

same problem

i print

2

1
2
1

2
2
2

3

1
2

3
4

4
5

1

2
2

3
3
3

4
4
4
4

5
5
5
5

Factorial

n = 5

$$n! = n \times (n-1) \times (n-2) \times \dots \times 1$$

6	7	8
7	8	9

Sol

fact = 1;

scanf ("%d", &n)

for (i=1; i<=n; i++)

{ fact = fact * i;

}

$$5! = 5 \times 4 \times 3 \times 2 \times 1$$

Prime Number:

(n)

single एकल

एक

2-50 तक

एक

दो अंकों के शून्यांक वाले

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

{ if (n % i == 0)

printf ("It's not prime.");

break

}

for n एकल

होता है

होता है

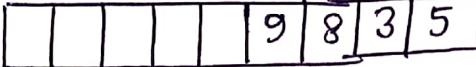
कल की नमूना लिखें

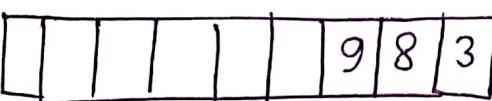
ZM

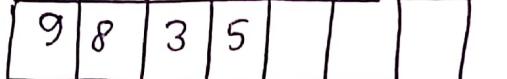
02/2/2020

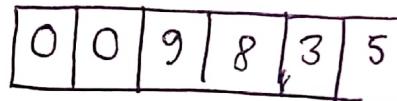
Integer:

$$a = 9835$$

`printf("%d", a);` 

`printf("%3d", a);` 

`printf("%-d", a);` 

`printf("%.06d", a);` 

float point ഫലം യാ ശരേ:

$$\text{pow}(x, y) = x^y$$

`float a = 98.6743`

`printf("%.f", a);`

`printf("%.2f", a);` $a = 98.67$ (ഡാമിൽ ഒരു ട്രൈയർ)

`printf("%.2.2e", a);` $a = 9.8743e1$ (f എൻഡിംഗ്

e ശരേ | e ദിനെ point ഏ അടിസ്ഥാന ശുള്ക നാ ഫേബ് point
എ ആംഗ് ഏ ചുണ്ട് !

floor function $\lfloor \cdot \rfloor$ = immediate छोटे संख्याति हठे।

ceiling function $\lceil \cdot \rceil$ = immediate बड़े संख्याति हठे।

Character:

`scanf ("%c", &a);` → एक छोटे single character।

`scanf ("%5c", &a);` → `scanf ("%s", a);`

→ 5 टो char string, just s दिलें चल,

अंत तक char तक राज करा शाय!

नेहरू मात्र space वाला ता-उ character

हिमरे नम् हठे।

`MDMIC = MD MI = %5c`

NEW DELHI = storing in 'a'

`printf ("%5c", a);` ⇒ NEW D

→ `scanf ("%s", &a);` / `scanf ("%5s", &a);`

$a = 913$

`printf ("%d", a);` → यह दिए गए संख्या है।

→ left align

9	1	3			
---	---	---	--	--	--

`printf ("%d", -a);` → -913 → (-) sign दिये

मुझे हो / प्राप्त हो।

`printf ("%d", -a);` ⇒ -

9	1	3		
---	---	---	--	--

`printf ("%d", a);` ⇒

			9	1	3
--	--	--	---	---	---

sign bit (+) होना show करते ना।

But (-) होना show करते। एवं जब 1 फी extra bit auto
योग हो।

Format Specifier

`printf ("%x", a);` ⇒ Hexadecimal output

`printf ("%o", a);` ⇒ Octal output

17.02.2020

Array

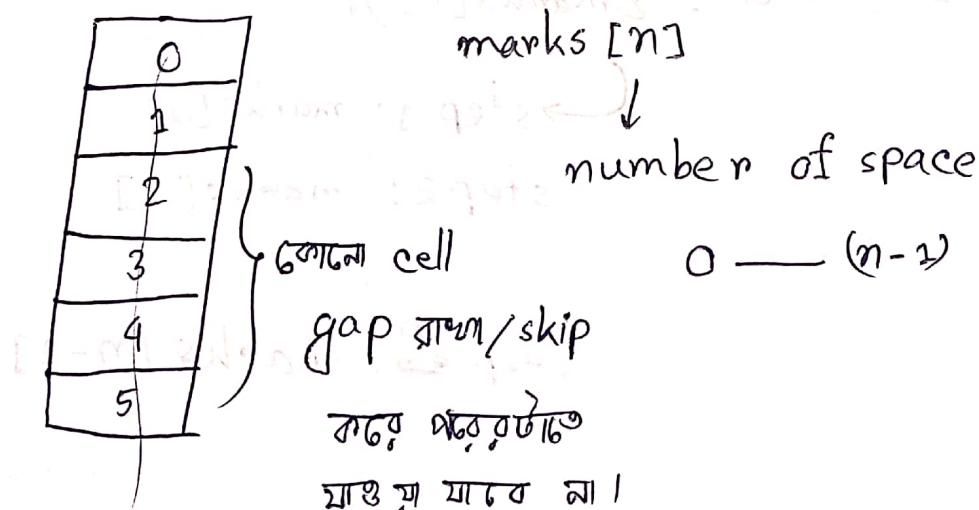
Collections of sequential elements
↳ (not random)

which have same types and same names.

char name;
int marks;
integer विचारणा जो
variable.

int marks2, marks2, marks3;
int marks [3];
index value
रखण्डा variable
(+1) लेण्डा गावा वेधें पाठ्याचीत
याओऱ्या याचे ना।

Array - एड मार्ग्यामध्ये memory ते number of space तेहि इय.



int marks[6];

0	77
1	67
2	23
3	63
4	72
5	69

মন কোর কাঠের space ~~আছে~~ আছে/ gap
আছে তবে ক্ষয়ান আলতে কেন্দ্র

→ free space 'এ' নতুন element add

কাঠের মর্কেজ element এর ফর্ম
লাই যুক্ত হুবো।

Array টে input কোষ্ট ও output

সুপর ফিল্ড কালাতে হবে (চোখের loop)

int marks[10], n; i;

for (i=0; i<n; i++)

or, for (i=1; i<=n; i++)

i=10; i<=n

o scanf ("%d", &marks[i]);

→ step 1: marks[0]

step 2: marks[1]

step ~~n~~: marks[n-1]

~~user define~~ index value from user:

```
int n;
```

```
scanf ("%d", &n);
```

```
int marks [n];
```

compilation

ଅର୍ଥ ଯଦ୍ୟ compiler

program କେ execute

ଅର୍ଥ ଅନ୍ୟ library

function ଏବଂ linked

function ସୁନୋଟି linked

ଅର୍ଥ ମେମୋରୀ Memory space

ଅର୍ଥ ପାଇଁ compile

Array initialization

i) Compile time (free space ବିଲ୍କ +
value assign)

ii) Run time (କୁଟି free space ବିଲ୍କ)
(ଅର୍ଥାତ୍ ପ୍ରାର୍ଥନାତ୍ମକ
assign)

```
int a [5] = {2, 6, 6, 9, 1};
```

Array କୌଣସିଲାଇ କାହିଁ ଅଛନ୍ତି

ଅର୍ଥ ବୁଲା ଫିଲ୍ କିମ୍ବା ।

a	2
1	6
2	6
3	9
4	1

ପୁଠି ପରେଲୁ
ଫିଲ୍ କିମ୍ବା

But run time ଏ ଜୁମ୍ବା କୁଟି କାହିଁ

a	0
1	
2	
3	
4	

int a[5];

for (i=0; i<5; i++)

{

scanf ("%d", &a[i]);

}

run time
initialization

initialization

किसी नंबर की इनपुट। तो नंबर का गठन आएगा अ

तो देखा।

⇒ int a[100], n, count = 0, p;

printf ("Enter the element you want the
frequency:);

scanf ("%d", &p);

for (i=0; i<n; i++)

{

if (a[i] == p)

count ++;

$m = 5$

$n = 5$

$$(v) \frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v = \underbrace{j=1}_{i=1} \dots \underbrace{i=n}_{i=1}$$

i

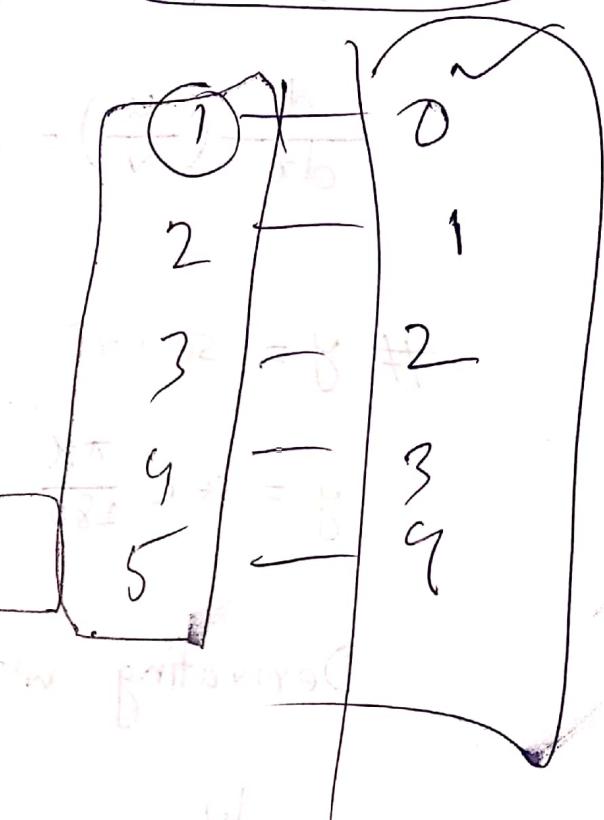
$$\underbrace{j=0}_{i=1} \dots \underbrace{i < n}_{i=1}$$

v

~~2~~
~~3~~
~~4~~
~~5~~
~~6~~
~~7~~
~~8~~
~~9~~

~~9~~

~~5, 6, 7~~

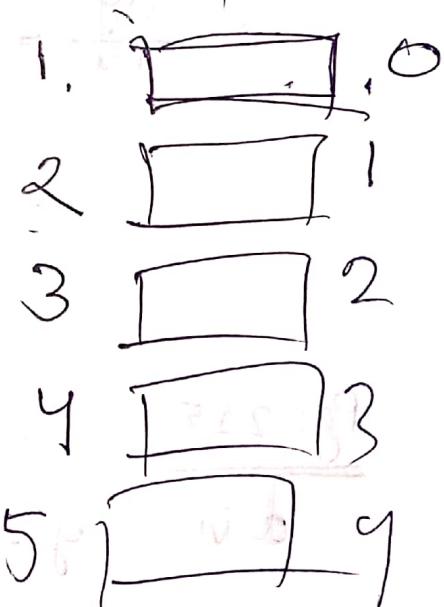


$$5 \frac{m+1}{m+1} \frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v = 1 \frac{m+1}{m+1} \frac{b}{\sqrt{2}} v$$

$$m \rightarrow m+1 \rightarrow m+1$$

$$m+1 \rightarrow m \rightarrow m+1$$

$$m \rightarrow 6$$



$$5 \frac{m+1}{m+1} \frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v = 1 \frac{m+1}{m+1} \frac{b}{\sqrt{2}} v$$

$$5 \frac{m+1}{m+1} \frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v = 1 \frac{m+1}{m+1} \frac{b}{\sqrt{2}} v$$

$$\left(\frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v \right) + \left(\frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v \right)$$

$$\left(\frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v \right) + \left(\frac{b}{\sqrt{2}} v + (v) \frac{b}{\sqrt{2}} v \right)$$

~~Lab(extra) with Group-B~~

int max = a[0]

for (i=1;

 a[0] define ~~value~~ max

 { go ~~value~~ index a[1]

 go max compare ~~value~~

a[5]

int max = a[0];

for (i=1; i<5; i++)

{

 if (a[i] > max)

 max = a[i];

} printf ("%d", max);

ZM

Two dimensional Array

Column

Row

	0	1	2	3
0	00	01	02	03
1	10	11	12	
2	20	21	22	
3	30	31	32	
4	40	41	42	
5	50	51	52	
6				
7				

cell number

cell

int [10]

1st column

1st row

int a[10][3]

number
of row

number
of column

row then column

structure: `int a [row_size][column_size]`

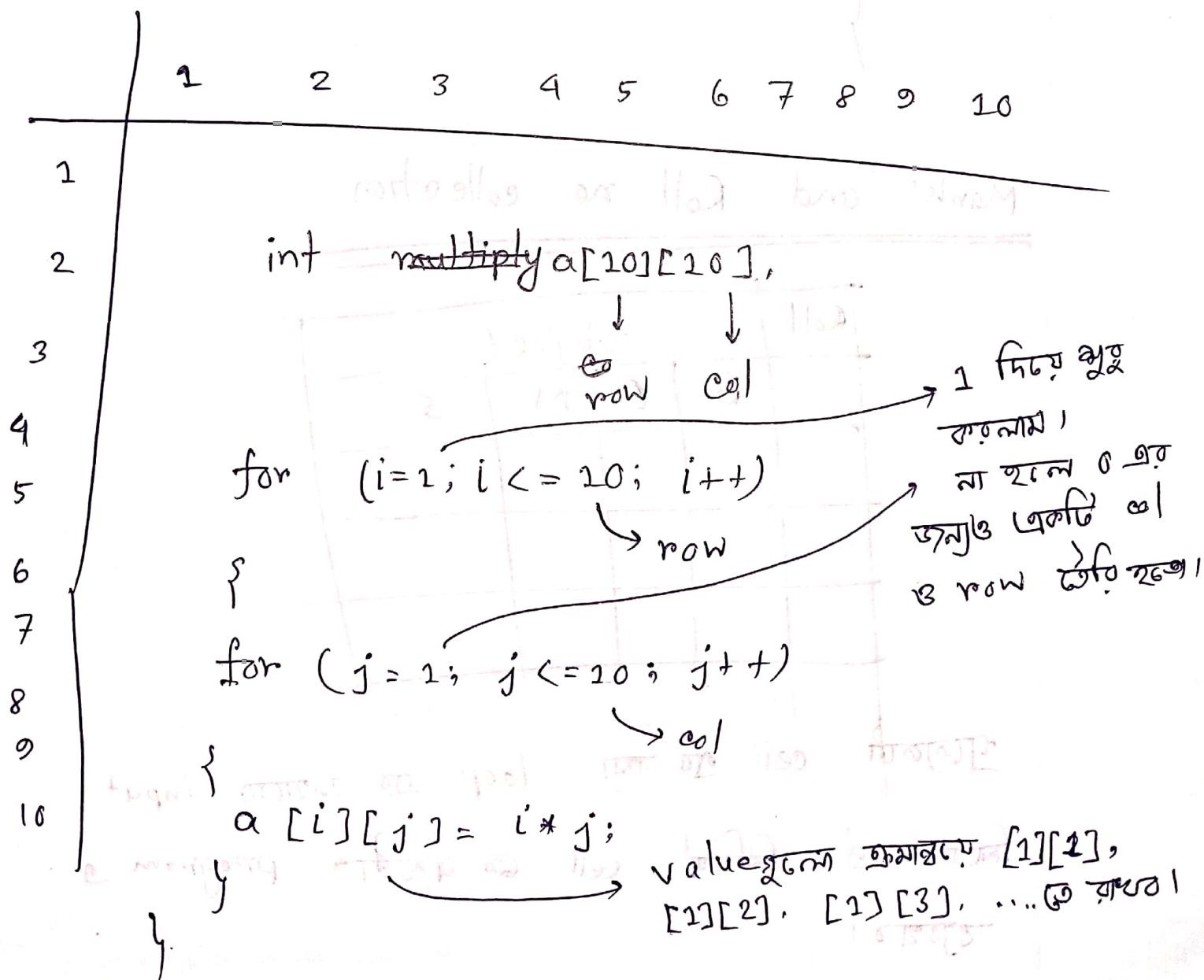
sequence maintenance: 1) now by presentation:

→ 00, 01, 02, 10, 11, 12

2) column by presentation;

00, 20, 20, 30, ..., 50, 01, 01,

multiplication table (with two dimensional array)



final: for ($i=1; i \leq 20; i++$)

{

for ($j=1; j \leq 20; j++$)

{

printf ("%d");

}

printf ("\n");

}

Marks and Roll no collection

Roll	subject			
	B	E	M	S

एकोला cell द्वारा loop द्वारा input

for के फलस्वरूप cell को प्रोग्राम program को बदलता है।

गुणातः [

[20] [5] ५० डेटा।

```
# char text[200];
```

```
printf("Enter a line: ");
```

```
gets(text);
```

↓

sentence

to store

to support

free space

white space.

or, p = size of (text);

```
for (i=0; text[i] != '\0'; i++)
```

i < p

end of line

char
limitation

only one white
space stored

eg. fast input case

Karim

9219

int i, vowel, constant, digit, space, special character;

for (i = 0; text[i] != '\0'; i++)

{

if (text[i] == 'a' || 'u')

text[i] == 'A' || 'U')

vowel++;

↳ vowel count, 2 ~~ways~~ ways

else if (text[i] >= 'a' && text[i] <= 'z')

|| (text[i] >= 'A' &&)

constant++;

digit++;

else if (text[i] >= 0 && text[i] <= 9)

space++;

else if (text[i] == ' ')

sc++;

else

special++;

Last \Rightarrow print \rightarrow for

print f (

char text[200];

int i, r, c, d, g, s, p;

r = c = d = w = s = p = 0;

printf ("Enter a line: ");

gets (&text);

for (i = 0; text[i] != '\0'; i++)

}

if (text[i] == 'o' || text[i] == 'O')

{

w += 1; r += 1;

else if ((text[i] == 'a' && text[i] <='z') ||

{

t += 1; k += 1;

} else

;

else if ($text[i] \geq \text{all} \text{ } text[j] <= \text{a}$)

$i++;$

else if ($text[i] = ' '$)

}

}

else,

{

$sp++;$

}

printf("%c vowel %d\n" $\text{ans} = \text{ans}$)

Digit \Rightarrow digit Space \Rightarrow den

$sp = \text{digit}$, records + sp)

}

2M

Character Array:

Form fillup:

First name: name1

Last name: name2

~~int n = 3~~
~~fb~~

Print

Name:

strcat()

→ ফাংশনটি দুটি string কে জোড় করে।

strcat(name1, name2);

First Name: R A H I M

Last Name: U D D I N

Name: R A H I M U D D I N

strcmp()

string

compare

string হলেও একে কি বলা

just like $a == b$?

$a = b$

→ b এর value, a টে assign করা / copy করা

তবে string copy করা

strcpy()

কোনো string এর ~~কিছি~~ length

কতটুলু আছে

(text) size = ?

length = ?

আসো সফ লেব

(+4, +7) = 11

1. for ($i=0; \text{text}[i] != '\0'$)

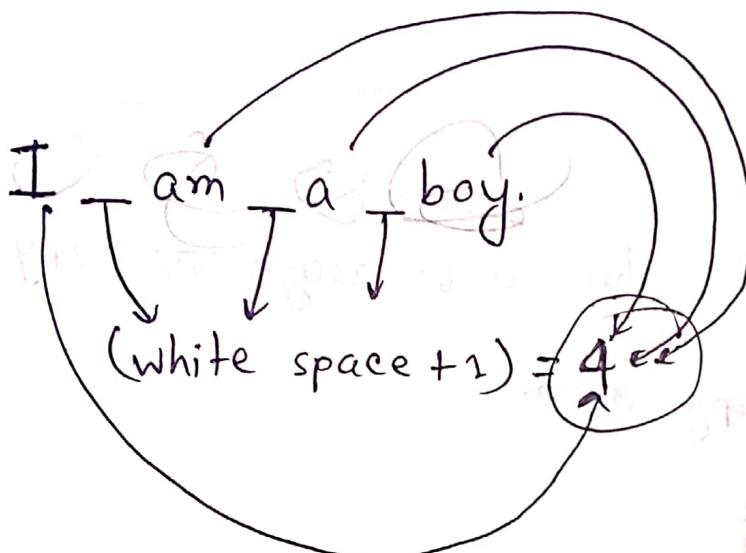
} or, 3. `sizeof(text)`

or, 2. $p = \text{strlen}(\text{text})$

for ($i=0; i < p; i++$)

গেজে sentence র কয়টি word আছে।

⇒ white space রেখা $(+1)$ ।



I am a boy

I | am | a | b o y

[Orginal]

char text [200];

p = strlen(text)

int count = 0;

for(i=0; i<p; i++)

{
if (text == ' ')

count ++

} printf ("%d", count + 1);

string টি void এর,

i < p condition false

loop এ ফুলে না।

integer reverse:

~~26~~ input: 16213
output: 31261

int

while ($a > 0$)

{ printf("%d", $a \% 10$);

$a = a / 10$;

}

character reverse:

text[\square] = SWADHIN

p = strlen(text)

for ($i = p$; $i > 0$; $i--$)

{

printf(text[i]);

}

:((002,"bx")) {base}

Palindrome

palindrome
एक ऐसी शब्द है जिसका अवलोकन से उसका अर्थ बदल जाता है।
उदाहरण: madam, radar, level, racecar, etc.

2 3 2 3 2

reverse करें और एक variable में assign
करें तो then string compare.

Alternate number

input: 5 3 2 1 7 9 10

output: 3 1 9 (1 वाले नंबर 2 वाले

(print वाले)

int a[10], i, n;

for (i=0; i<n; i++)

{
scanf ("%d", &a[i]);

for ($i=0; i < n; i += 2$)

{ printf ("%d", a[i]); }

element no | 0

 | 1 2 3 4 5 6
5 | 3 2 1 7 9 10

$i = 0; i < n$

output: 5 2 7 9

$i = 2; i < n; i += 2$

output: 3 2 9

2M

02/03/2020

Function

User defined function:

easier कार्य करना, modularity करना जैसा।

main function पर गणित user declare करता है।

prime number, sqrt, fibonacci, इत्यर्थों के लिए आवाद
आवाद function. यहाँ प्राप्ति में से एक।

factorial and prime number (function 2)

```
return type → function name  
⇒ int fact (int a) → parameter (परमाणु)  
{ fact = 1; → कोई value fact  
    for (i=2; i<=a; i++) → नहीं प्रदान  
    { fact = fact * i; → नहीं प्रदान  
    } printf ("Factorial = %d", fact); → नहीं प्रदान  
}
```

fact (int a)
परमाणु
कोई value

परमाणु
(परमाणु)
नहीं प्रदान

परमाणु
नहीं प्रदान

50

```
int prime ( int a )
```

```
{ int c = 0
```

```
for ( i = 2; i < a; i++ )
```

```
{ if ( a % i == 0 )
```

```
{ printf ("Not prime."); }
```

```
    c++;
```

```
if ( c == 0 )
```

```
printf ("Prime");
```

④ main function

```
int main()
```

```
{ int a, b, c, i;
```

```
scanf ("%d", &a);
```

```
fact(a) → so  
prime(a) }
```

main function का

निम्नलिखित function का

call करता है।

call करता है। ताकि main

function के

parameter को pass

करता है।

so fact(a) → so
prime(a) } → so

```
#include <stdio.h>
```

```
{
```

```
int a, b, c, i;
```

```
scanf ("%d", &c);
```

```
b = fact(c);
```

```
printf ("%d", b);
```

```
int fact (int a)
```

```
{ int factorial = 1
```

```
for (i=2; i<=a; i++)
```

```
{ factorial = factorial * i;
```

```
}
```

```
return (factorial);
```

→ user function
→ printf

→ all
main function

→ Data
return val,
print val

main function → factorial
→ print proto
→ return value.

~~normal~~ main () ଏ program from main ଏ
return କାହାର ମାତ୍ର କିମ୍ବା ୨୮୦ ଏ । void ~~retu~~ type.
return (0).

int a, b, s;

scanf ("%.d", &s)

switch(s)

CASE 41:

fact() → fact function to call

case 2:

prime ()

prime number to call ~~the word~~

execution time \approx 100 ms

ଫୁକ୍ଶନ୍ କିମ୍ବା ଫଂକ୍ଷନ୍ ହେଉଥିବା ଏକ ପରିପରାଗତି ହେଉଥିବା ଏକ ପରିପରାଗତି

execute $\overline{200}$ | case 1 $\overline{260}$ case 1 $\overline{260}$

Case 2 260 N 1

~~previous
class problem~~

char text [11]

character, digit, special symbol

y | o | u | | w | i | l | l | d | o

Spacing $\pi\Omega$

~~for~~ ~~white space~~ ~~and~~ wrong answer ~~ans~~

Condition after ~~ans~~ ~~ans~~ ~~ans~~

text [i] = ' \nearrow one space

text [i+1] = ' \nearrow two space

text [i+2] = ' \nearrow three space } count $\pi\Omega$

ZM

प्र० अल्पी

09/03/2020

function categorization

1. void prime (void) → return type वा parameter
जैसे void
(body के लिए नहीं आवश्यक है)
run करें।
 2. void prime (int a, int b) →
return type वा parameter आए।
 3. ~~void~~ int factorial (void) →
return type वा parameter नहीं आए।
but parameter आए।
 4. int factorial (int n) →
return type वा parameter नहीं आए।
but parameter वाला है।
- return वा parameter
(जैसे आए।)
- return type वा
integer type का data.

Call करें:

1,3) int main ()
{

 prime ();
}

2. int main.
{

 prime (a, b);
}

vjudge Lab test (solve)

Problem: B

① - 9 → zero, one, two ...

> 9 → even or odd

```
int main ()
```

```
{ int n, i, a; scanf ("%d", &n); }
```

```
printf ("Enter a number: "); for (i = 0; i < n; i++)
```

```
{ scanf ("%d", &a); }
```

```
number_to_text (a); }
```

```
return 0;
```

```
}
```

```
void number_to_text (int a), → no return
```

```
type with
```

```
parametric value
```

```
{ if (a == 0)
```

```
printf ("zero"); }
```

```
else if (a == 1)
    printf ("one");
```

```
else if (a == 9)
```

```
    printf ("nine");
```

```
else if (a % 2 == 0);
```

```
    printf ("Even");
```

```
else
```

```
    printf ("odd");
```

```
}
```

Problem c (Prime number in a range

a → starting value

b → ending value

```
scanf ("%d %d", &a, &b);
```

```
for ("i = a; i <= b; i++)
```

```

for (j=2; j < i; j++) {
    if (i%j == 0)
        printf("count = 0");
    else
        count = 1;
}
printf("%d", count);

```

```

#define p, count = 0;
for (i=2; i<p; i++) {
    if (p%i == 0)
        printf("not prime");
    else
        count++;
}
printf("%d", count);

```

Problem: D

> | Compare
 <
 =

problem D is to read two words and decide if they are equal.

Problem: E

input: 1 7 output: Case 1: 8

9 8 Case 2: 17

(++), d=8, (0=3) not

n

```
for(i=1; i<=n; i++)
    printf("Case %d: %d\n", i);
```

Problem:F

most and least salary out 2601
middle value 2601

(Max. value) & (Min. value)

```
if(b < c && b > a) || (b < a && b > c)
    print (b)
```

```
else if(a < b && a > c) || (a < c && a > b)
    print (a)
```

else

c

(Max. value) & (Min. value)

Problem: I

blank print

$$\# \longrightarrow 4 \longrightarrow 5 - 2 = 4$$

$$\# \# \longrightarrow 3 \longrightarrow 5 - 2 = 3$$

$$\# \# \# \longrightarrow 2 \longrightarrow 5 - 3 = 2$$

$$\# \# \# \# \longrightarrow 1 \longrightarrow 5 - 4 = 1$$

$$\# \# \# \# \# \longrightarrow 0 \longrightarrow 5 - 5 = 0$$

for ($i=1$; $i < n$; $i++$)

{

for ($j=1$; $j < n-i$; $j++$)

↓
row

{ printf (" ");

}

for ($k=1$; $k <= i$; $k++$)

{ printf ("*");

}

`printf("\n");`

$\Delta \text{vol} = \pi r^2 h$

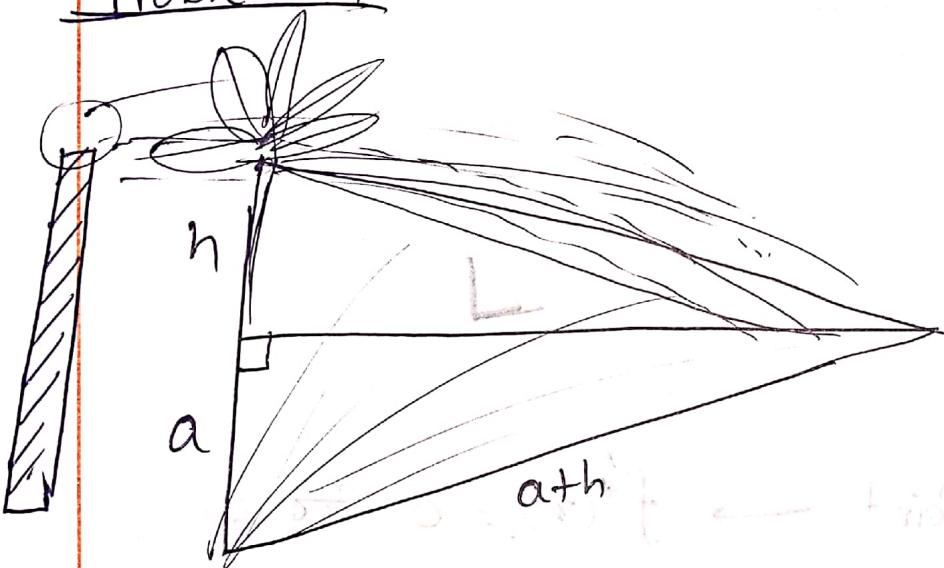
y

$\Delta \text{vol} = \pi r^2 h$

$V_{\text{vol}} = \frac{\pi}{3} r^2 h$

$\Delta \text{vol} = \frac{1}{3} \pi r^2 h$

problem: G]

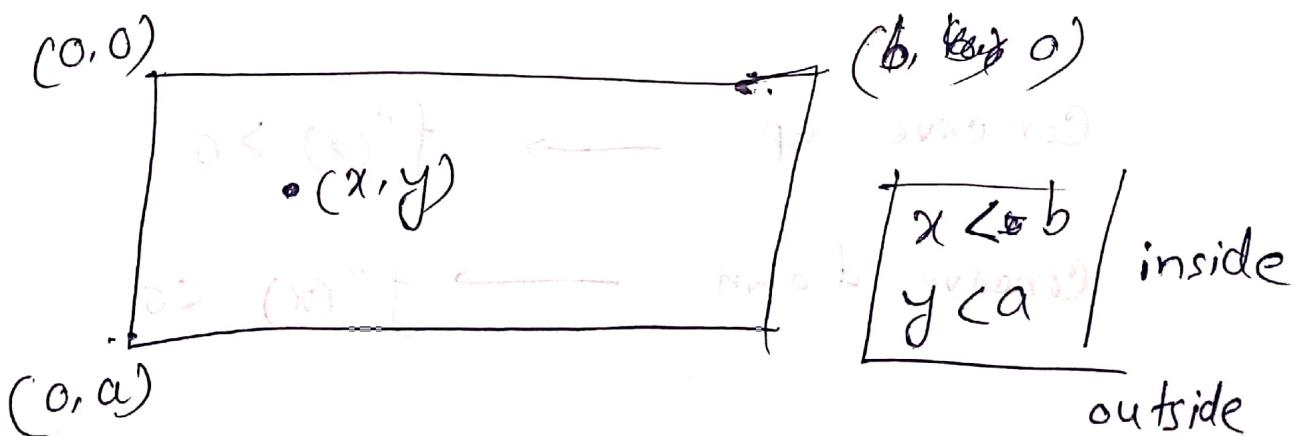


$$(a+h)^2 = a^2 + L^2$$

$$a = \sqrt{\frac{L^2 - h^2}{2h}}$$

Problem: G: (Cow) boundary line ৰে নথি নি।

$x = (x)^T$ —> position to trust



ଏହି function କିମ୍ବା ନିଜତେ ଗଠନ

ରାଖିଲା → Recursive ~~set~~ function

Recursive function ଏହି loop ହାତିଲା

program ବଳତୋ ହାତିଲା ନିଜକୁ ନିଜତାରେ

ରାଖିଲା ରାଖିଲା ଗଠନ, (କାମିଟାରେ pass କରିଲା)

ତାହିଁ loop ଦସ୍ତାନୀ ନାହିଁ ।

Structure in C

struct → keyword

ଏହି ବ୍ୟାକ୍
structure ଏହି name

କିମ୍ବା structure ଏହି variable

କରିଲା ।

ମୁଣ୍ଡଳ କିମ୍ବା କାମିଟାରେ global ଏହି, main function
ଏହି ଉପରେ ।

50 ଜନ୍ମ କରିଲେବେଳେ ଏହି (structure ଏହି
କାମିଟାରେ)

Data କିମ୍ବା sort କରିବାକୁ ନିଷ୍ଠା । (କୋମାର୍କ କାମିଟାରେ କାମିଟାରେ)

Online Class

5/7/2020

```

// include <stdio.h> #include <ctype.h>
int main()
{
    int i;
    char ch[20];
    gets(ch);
    i = 0;
    while (ch[i] != '\0');
    {
        if (islower(ch[i])) {
            printf("%c is lower case \n", ch[i]);
        }
        else if (isupper(ch[i]));
        printf("%c is upper case \n", ch[i]);
    }
    else
        printf("%c is a number", ch[i]);
}

```

5 July, 2020

2019 session

Stopwatch

```
#include <stdio.h> // #include <windows.h>
#include <stdlib.h> // Windows API
int main ()
{
    int hour, minute, second;
    printf ("Enter hour, minute, and second: ");
    scanf ("%d.%d.%d", &hour, &minute, &second);
    printf ("%d:%d:%d\n", hour, minute, second);
    int h=0, m=0, s=0;
    while (1) // goes to next line
    {
        if (h==hour && m==minute && s==second)
            break; // statement go to next line
        printf ("%d:%d:%d", h, m, s);
        h++; // replace \r (carriage return) → \n
        if (h==24)
            h=0;
    }
}
```

```
{ break;
} s++ ; sleep (1000); // parameter (রেজন্ট) wait (৫০)
1000ms = 1sec
```

if ($s == 60$)

{
 $m++;$

$s = 0;$

if ($m == 60$)

{
 $h++;$

$m = 0;$

return 0;

}

Zulfiker Sir

7/7/2020

C union

Structure හේ මෙය

පහත මෙමේදී නොගෙනවා

structure

char x; → ප්‍රාග්ධනය

float y; → ප්‍රාග්ධනය
මුදල්‍ය යුතු

Union

char x;
float y;

x and y

ಸಮಸ್ತ ಮೊದಲು ಗುಣಾಕಾರ
ಮರಡಿಯೇ ಈ ಮೊದಲಿಗೆ
ಖಚಿತವಾಗಿ ಗುಣಾಕಾರ

ಖಚಿತ ಮೊದಲಿಗೆ ಗುಣಾಕಾರ
ಖಚಿತ ಮೊದಲಿಗೆ ಗುಣಾಕಾರ

* ಏಕಮಾತ್ರ ಇಂಟಿ variable ನ ಸ್ಥಾಪಿಸಬೇಕು

* ಎಹುನ ಗೊಂತು variable ನ assign ಕಾನೆ ಆಗಬ್ಯಾಲೆ

replace ಇದ್ದು ಯಾದು | ಮರಡಿಕೊಂಡಿರಿ ಅಂದಿನ
variable ಇದ್ದು ಯಾದು | ಇದ್ದು ಯಾದು |

variable ಇದ್ದು ಯಾದು | ಇದ್ದು ಯಾದು |

Enum:

String ಶ್ರೋತರ ನಂಬರನ್ನು convert ಕಾನೆ

0 ಫೋರ್ಮ್ ನಿಯಮಿಸಿ (by default)

user defined ನಿಯಮಿಸಿ ನಿಯಮಿಸಿ change ಕಾನೆ ಯಾದು |

switch

case 0: statement

Amisha Mam

Passing pointers to function

- * pointer value টাকে pass কৰে, address কৰ নয়

EM

16/8/20

C টে ফাইল সিস্টেম :

'w' mode এ over written হবো। যাখো কেটি

যুক্ত ফিল্ড নতুন কেটি overwrite হবো।

'a' mode এ একই নামে ফাইল থাকলে \Rightarrow ফাইল

overwrite না হব্বে যাখোকি হোলে মেঘ নতুন

কেটি এখ গঠ(যোগে) যুক্ত হবো।

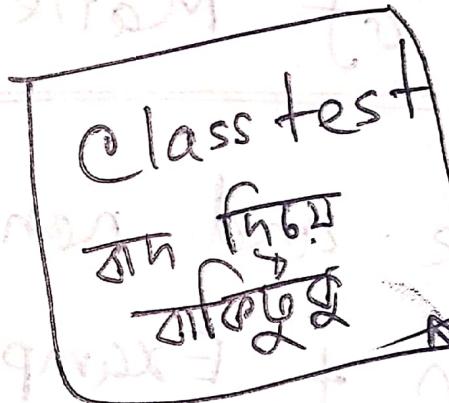
Review Class (1st Sem)

ST C (ZM)

കോണ്ട്രയിഡിഫീസ്, കോണ്ട്രക്വേറ്റ് കേവഴ്സ്. (സെൻ?)

Expression, valid / invalid.

Loop അംഗം basic concepts.



9/6/21

VIVA

21.06.21

Review Class:

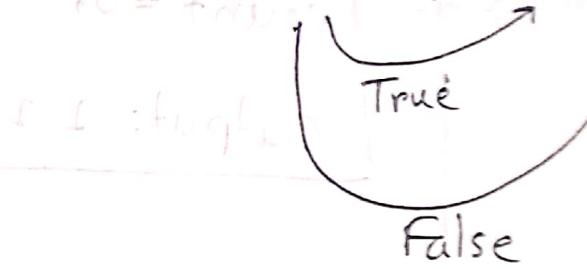
24/6/21

SPL

formfeed \f

Conditional Operator

int s = (a>b) ? a : b;



Bitwise Operator

Bit by bit operation

ASCII निहाय

संख्या निहाय

लाज लाज

a = 5 → 0000101

4 bit निहाय

b = 9 → 00001001

लाज लाज

now tri a & b → 00000001

लाज लाज

5 & 9 → (1)₁₀

(1)

5 or 9 → (00001101)₂ → (13)₁₀

Difference between static int and int:

```
#include <stdio.h>
int fun()
{
    static int count = 0;
    count++;
    return count;
}
```

```
int main()
{
    printf ("%d", fun()); → 0 + 1 = 1
    printf ("%d", fun()); → 1 + 1 = 2
    return 0;
}
```

static int count;
count = 0;
Output: 2 2

static int count = 0;
count = 0;
Output: 2 2

static थाने
कारण मर्मिष value
destroy हुतो।

यदि वृमान int थाने
अठे यात्ता result थामता 1.

कार्य function कोष्ठूप्त होने
value-वृ destroy हुत्या यातो।

constant keyword

(Endekke kira) value

const int i=0; → i का value fixed.

change करने नहीं

(function का फल)

typedef

type/depth, enum

name का int

conversion का conversion

name दूसरों परिक्षण

constant का वर्ताव करना

प्रकार।

typedef int b;

b x,y,z;

→ int f()

प्रयोग करें।

(Template)

int a=5, b=6, c;

c = (a > b);

printf("%d", c);

printf("%d", !(a < b));

output: 1 1

SPL (Review Class)

21/6/21

Call by value | Call by reference

* variable এর

copy pass (not
actual var)

* এর value টি

কোন পরিবর্তন হবে

না।

* variable এর address

pass (means passing the actual variable

* এর value টির পরিবর্তন হবে

address এ এর value assigned

হবে যা আচরণ করে থাকে।

single quotation → character ফর্মেট ' , detect করে
double " → string " " " " detect করে

~~extern~~ keyword

pointer of pointer (pptr)

* pointer ~~for~~ variable ~~to~~ access

ক্ষেত্র (D) Time *ptr; // - ২০১৫ পাঠ্যক্রম

pointer ~~for~~ pointer ~~to~~ access

রিটুন time করুন।

Copy file one from another

Function Prototype

void change (int num) → function prototype

return function name

parameter list

Register type variable

जो Fast वाले रहें (RAM में होंगे)

जो Slow रहें (SS - PS)