

BCA Optimized Notes by Yash

Semester IV - Dart Programs

Table of Contents

Unit 1 - Chapter 2	3
1) Basics	3
2) Arithmetic Operations	3
3) Map	3
4) Fixed Length List	4
5) Growable List	5
6) Sets	5
7) Records	6
8) Map	6
9) Class	7
10) Function (Return)	7
11) Types of Parameters	8
12) Recursive Function	8
13) Lambda Function	9
14) If, Else-If, Else	9
15) Switch Case	9
16) For Loop	10
17) Table	10
18) For In Loop	11
19) For Each Loop	11
20) While Loop	11
21) Do While Loop	12
22) Class Again	12
23) Constructor	13
24) Getter and Setter	14
25) Single Inheritance	14
26) Multilevel Inheritance	15
27) Method Overriding	16
28) Constructors w/ Inheritance	17
29) Parameterized Constructors w/ Inheritance	17
30) Individual Parameterized Constructors w/ Inheritance	18
31) Passing Parameterized Constructors w/ Inheritance	18

Unit 1 - Chapter 2

1) Basics

Code

```
void main() {  
    int var1 = 10;  
    double var2 = 0.2;  
    bool var3 = false;  
    string var4 = "0", var5 = "SYBCA - Dart";  
    print(var1);  
    print(var2);  
    print(var3);  
    print(var4);  
    print(var5);  
}
```

Output



The screenshot shows the Dart IDE interface with the file 'program1.dart' open. The output window displays the results of the program execution: 10, 0.2, false, 0, and SYBCA - Dart.

```
Yash Dart dart program1.dart  
10  
0.2  
false  
0  
SYBCA - Dart
```

2) Arithmetic Operations

Code

```
void main() {  
    int var1 = 20;  
    int var2 = 10;  
    print(var1 + var2);  
    print(var1 - var2);  
    print(var1 * var2);  
    print(var1 / var2);  
    print(var1 % var2);  
}
```

Output



The screenshot shows the Dart IDE interface with the file 'program2.dart' open. The output window displays the results of the arithmetic operations: 30, 10, 200, 2.0, and 0.

```
Yash Dart dart program2.dart  
30  
10  
200  
2.0  
0
```

3) Map

First Method

```
void main() {  
    var data = {"class": "SYBCA", "stream": "CS", "college": "SK  
Somaiya College"};
```

```

    print(data);
    print(data["college"]);
    print(data["class"]);
    data["location"] = "Vidyavihar";
    print(data);
    print(data["location"]);
}

```

Output

```

Yash > Dart > ✓ dart program3-1.dart
{class: SYBCA, stream: CS, college: SK Somaiya College}
SK Somaiya College
SYBCA
{class: SYBCA, stream: CS, college: SK Somaiya College, location: Vidyavihar}
Vidyavihar

```

Second Method

```

void main() {
    var data = new Map();
    data["college"] = "SK Somaiya College";
    data["class"] = "SYBCA";
    data["stream"] = "CS";
    print(data);
    print(data["class"]);
}

```

Output

```

Yash > Dart > ✓ dart program3-2.dart
{college: SK Somaiya College, class: SYBCA, stream: CS}
SYBCA

```

4) Fixed Length List

Code

```

void main() {
    List? data = List.filled(5, null, growable:false);
    data[0] = "SK";
    data[1] = "Somaiya";
    data[2] = "College";
    data[3] = "Vidyavihar";
    print(data);
    print(data[2]);
}

```

Output

```

Yash > Dart > ✓ dart program4.dart
[SK, Somaiya, College, Vidyavihar, null]
College

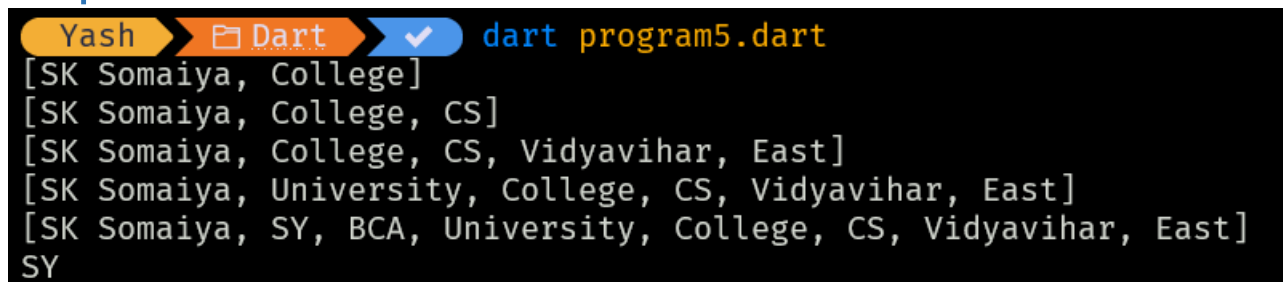
```

5) Growable List

Code

```
void main() {  
    var college = ["SK Somaiya", "College"];  
    print(college);  
    college.add("CS");  
    print(college);  
    college.addAll(["Vidyavihar", "East"]);  
    print(college);  
    college.insert(1, "University");  
    print(college);  
    college.insertAll(1, ["SY", "BCA"]);  
    print(college);  
    print(college[1]);  
}
```

Output



The screenshot shows the Dart IDE interface with a file named 'dart program5.dart'. The output of the program is displayed in a terminal window, showing the state of the 'college' list at various points: [SK Somaiya, College], [SK Somaiya, College, CS], [SK Somaiya, College, CS, Vidyavihar, East], [SK Somaiya, University, College, CS, Vidyavihar, East], and [SK Somaiya, SY, BCA, University, College, CS, Vidyavihar, East]. The final output is 'SY'.

6) Sets

Code

```
void main() {  
    var college = <String>{"Hello students"};  
    print("Value in set is: $college");  
    college.add("Welcome to SK Somaiya College");  
    print("Value in set is: $college");  
    var stream_name = {"CS", "IT", "BMS"};  
    college.addAll(stream_name);  
    print("Value in set is: $college");  
    var college1 = college.elementAt(0);  
    print("Element at index 0 is: $college1");  
    int l = college.length;  
    print("The length is: $l");  
    bool check = college.contains("CS");  
    print("$check");  
    college.remove("Hello students");  
    print("$college");  
    print("Using forEach");  
    college.forEach((element) {  
        if(element == "IT") {  
            print("Found");  
        }  
        else {  

```

```

        print("Not Found");
    }
});
college.clear();
print("$college");
}

```

Output

```

Yash > Dart > dart program6.dart
Value in set is: {Hello students}
Value in set is: {Hello students, Welcome to SK Somaiya College}
Value in set is: {Hello students, Welcome to SK Somaiya College, CS, IT, BMS}
Element at index 0 is: Hello students
The length is: 5
true
{Welcome to SK Somaiya College, CS, IT, BMS}
Using forEach
Not Found
Not Found
Found
Not Found
{}

```

7) Records

Code

```

void main() {
    var record = ("first", a:2, b:true, "last");
    print(record.$1);
    print(record.a);
    print(record.b);
    print(record.$2);
}

```

Output

```

Yash > Dart > dart program7.dart
first
2
true
last

```

8) Map

Code

```

void main() {
    var college = {"stream":"CS", "degree":"BCA", "college":"SK Somaiya"};
    print(college);
    print(college["stream"]);
    print(college[0]);
    college["address"] = "Welcome to";
    print(college);
    var college2 = {"location": "Vidyavihar " "East"};
}

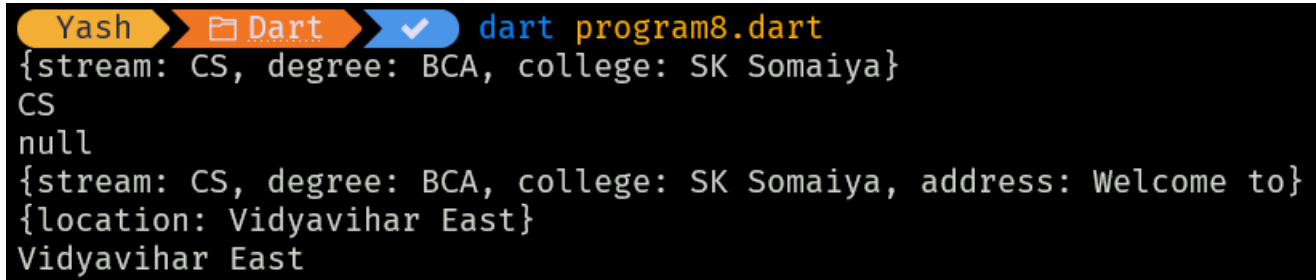
```

```

    print(college2);
    print(college2["location"]);
}

```

Output



```

Yash Dart dart program8.dart
{stream: CS, degree: BCA, college: SK Somaiya}
CS
null
{stream: CS, degree: BCA, college: SK Somaiya, address: Welcome to}
{location: Vidyavihar East}
Vidyavihar East

```

9) Class

Code

```

class College {
    var a;
    var b;
    void set(x, y) {
        this.a = x;
        this.b = y;
    }
    void add() {
        var c = this.a + this.b;
        print(c);
    }
}

void main() {
    College c1 = new College();
    College c2 = new College();
    c1.set(1, 2);
    c1.add();
    c2..set(3, 4)..add();
}

```

Output



```

Yash Dart dart program9.dart
3
7

```

10) Function (Return)

Code

```

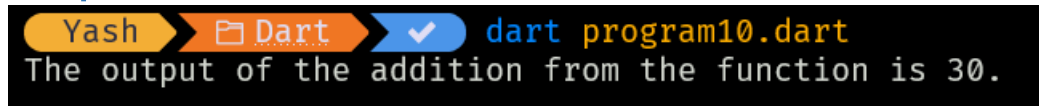
int add(int a, int b) {
    int result = a + b;
    return result;
}

void main() {
    var output = add(10, 20);
}

```

```
    print("The output of the addition from the function is  
$output.");  
}
```

Output



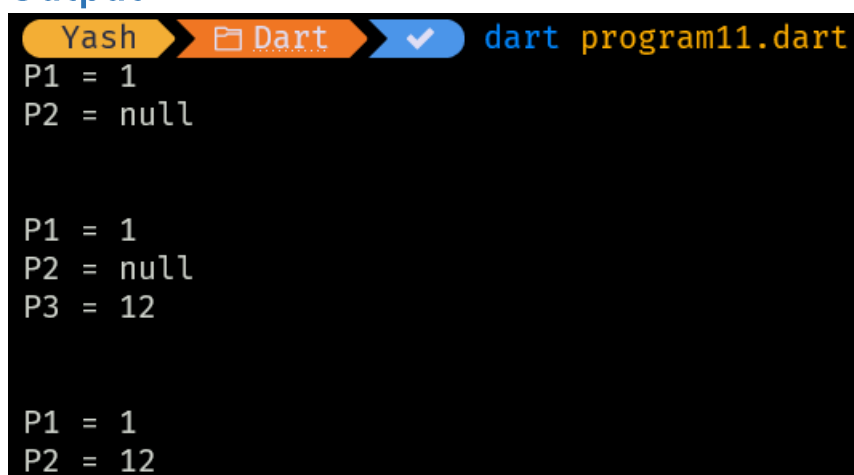
A terminal window with a dark background. At the top, there are three colored buttons: an orange button with 'Yash', an orange button with a folder icon and 'Dart', and a blue button with a checkmark icon. To the right of these buttons is the text 'dart program10.dart'. Below the buttons, the text 'The output of the addition from the function is 30.' is displayed in a monospaced font.

11) Types of Parameters

Code

```
void college1(int p1, [var p2]) {  
    print("P1 = $p1");  
    print("P2 = $p2");  
    print("\n");  
}  
void college2(int p1, {var p2, var p3}) {  
    print("P1 = $p1");  
    print("P2 = $p2");  
    print("P3 = $p3");  
    print("\n");  
}  
void college3(int p1, {int p2 = 12}) {  
    print("P1 = $p1");  
    print("P2 = $p2");  
}  
void main() {  
    college1(1);  
    college2(1, p3:12);  
    college3(1);  
}
```

Output



A terminal window with a dark background. At the top, there are three colored buttons: an orange button with 'Yash', an orange button with a folder icon and 'Dart', and a blue button with a checkmark icon. To the right of these buttons is the text 'dart program11.dart'. Below the buttons, the output of the program is displayed in a monospaced font, showing three separate function calls and their results.

12) Recursive Function

Code

```
int factorial(int n) {  
    return n < 2 ? n : (factorial(n - 1) + factorial(n - 2));  
}
```

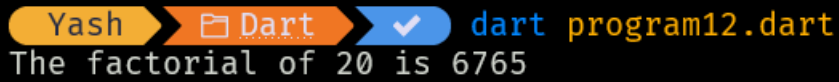


```

}
void main() {
    int i = 20;
    print("The factorial of $i is ${factorial(i)}");
}

```

Output



```

Yash > Dart > ✓ dart program12.dart
The factorial of 20 is 6765

```

13) Lambda Function

Code

```

void college() => print("Hello there!");
void main() {
    college();
}

```

Output



```

Yash > Dart > ✓ dart program13.dart
Hello there!

```

14) If, Else-If, Else

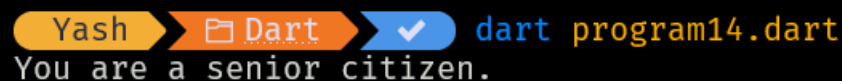
Code

```

void main() {
    int age = 65;
    if (age > 0 && age < 18) {
        print("You are a child.");
    }
    else if (age >= 18 && age < 60) {
        print("You are an adult.");
    }
    else {
        print("You are a senior citizen.");
    }
}

```

Output



```

Yash > Dart > ✓ dart program14.dart
You are a senior citizen.

```

15) Switch Case

Code

```

void main() {
    String stream = "CS";
    String clas = "BCA";
    switch(stream) {
        case "CS": {
            switch(clas) {

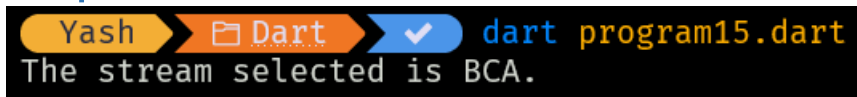
```

```

        case "BCA": {
            print("The stream selected is BCA.");
        }break;
    }
    }break;
    case "IT": {
        print("You have selected the IT department.");
    }break;
    default: {
        print("Please select a proper stream.");
    }
}
}

```

Output



```

Yash > Dart > dart program15.dart
The stream selected is BCA.

```

16) For Loop

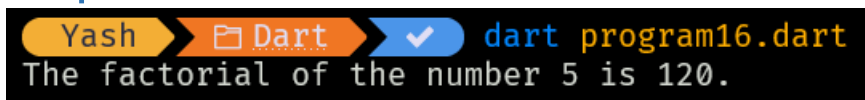
Code

```

void main() {
    int num = 5, fact = 1;
    for (int i = 2; i <= num; i++) {
        fact = fact * i;
    }
    print("The factorial of the number $num is $fact.");
}

```

Output



```

Yash > Dart > dart program16.dart
The factorial of the number 5 is 120.

```

17) Table

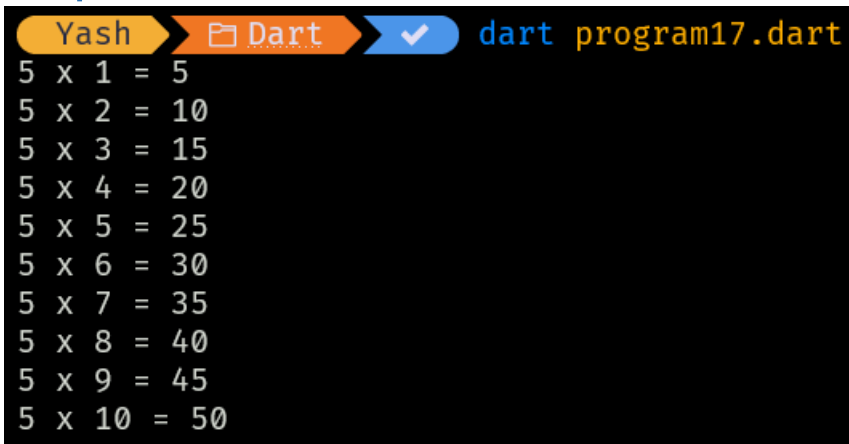
Code

```

void main() {
    int num = 5, result;
    for (int i = 1; i <= 10; i++) {
        result = num * i;
        print("$num x $i = $result");
    }
}

```

Output



```
Yash > Dart > ✓ dart program17.dart
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

18) For In Loop

Code

```
void main() {
    var data = [1, 2, 3, 4, 5];
    for (int i in data) {
        print(i);
    }
}
```

Output



```
Yash > Dart > ✓ dart program18.dart
1
2
3
4
5
```

19) For Each Loop

Code

```
void main() {
    var data = [1, 2, 3, 4, 5];
    data.forEach((var num) => print(num));
}
```

Output



```
Yash > Dart > ✓ dart program19.dart
1
2
3
4
5
```

20) While Loop

Code

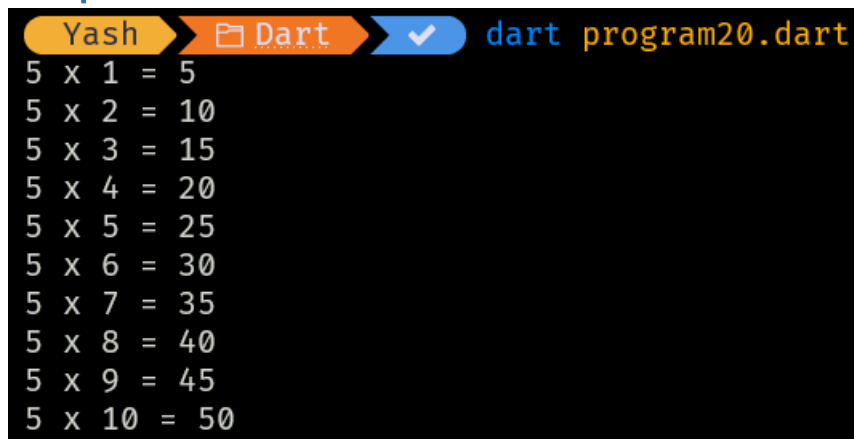
```
void main() {
```

```

int num = 5, i = 1, result;
while (i <= 10) {
    result = num * i;
    print("$num x $i = $result");
    i++;
}
}

```

Output



```

Yash Dart dart program20.dart
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50

```

21) Do While Loop

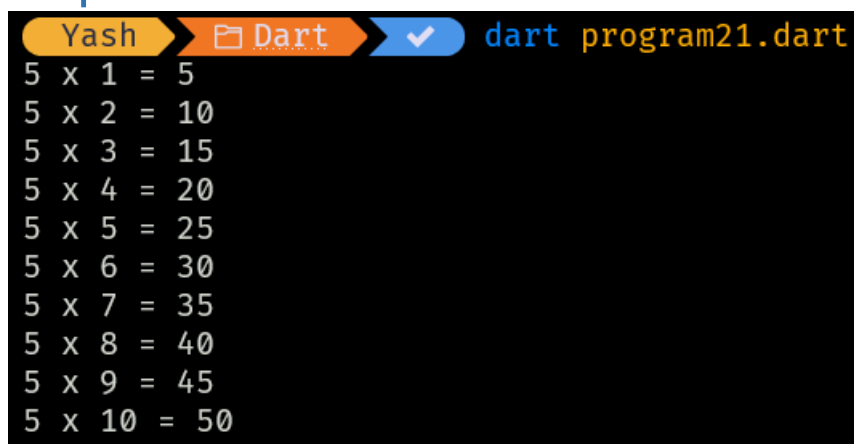
Code

```

void main() {
    int num = 5, i = 1, result;
    do {
        result = num * i;
        print("$num x $i = $result");
        i++;
    }
    while (i <= 10);
}

```

Output



```

Yash Dart dart program21.dart
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50

```

22) Class Again

Code

```

class Table {

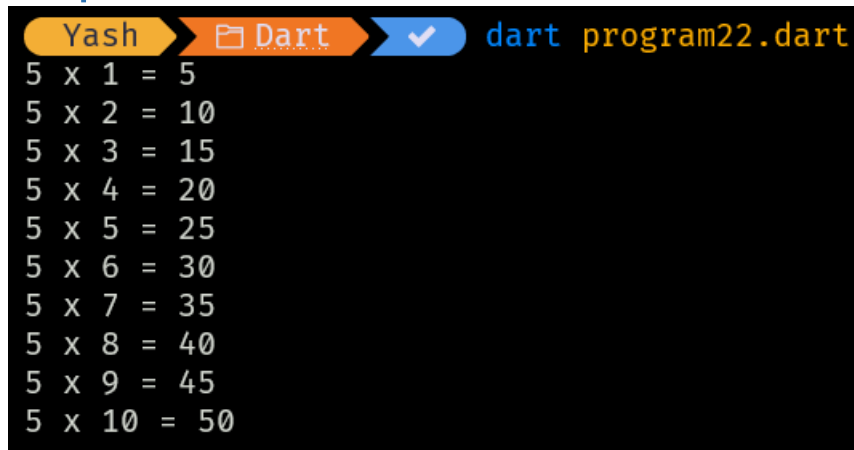
```

```

var i;
var result;
void multTable(int num) {
    for (i = 1; i <= 10; i++) {
        result = num * i;
        print("$num x $i = $result");
    }
}
}
void main() {
    Table tab = new Table();
    tab.multTable(5);
}

```

Output



```

Yash Dart dart program22.dart
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50

```

23) Constructor

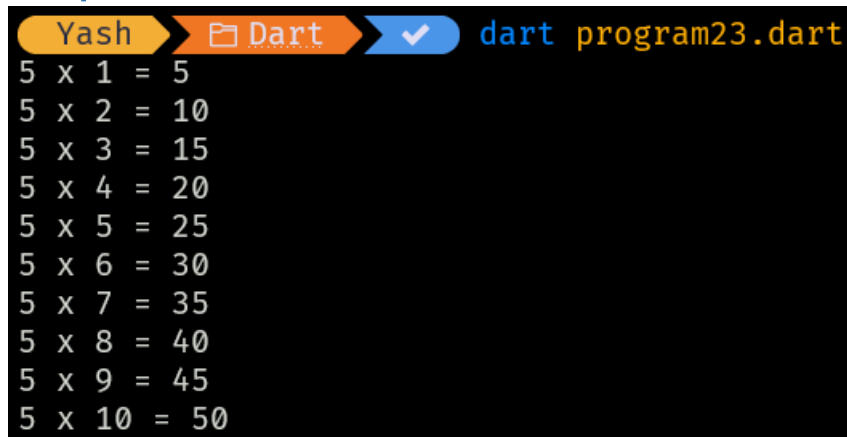
Code

```

class Table {
    Table(int num) {
        int i, result;
        for (i = 1; i <= 10; i++) {
            result = num * i;
            print("$num x $i = $result");
        }
    }
}
void main() {
    Table tab = new Table(5);
}

```

Output

A screenshot of a Dart IDE window showing the output of a program. The window title is 'Yash Dart dart program23.dart'. The output displays a multiplication table for the number 5, with rows from 5 x 1 to 5 x 10. The results are: 5, 10, 15, 20, 25, 30, 35, 40, 45, and 50.

```
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

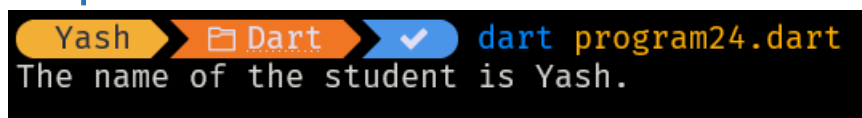
24) Getter and Setter

Code

```
class Student {
    String sname = "";
    set setName(String name) {
        sname = name;
    }
    String get getName {
        return sname;
    }
}

void main() {
    Student s = new Student();
    s.setName = "Yash";
    print("The name of the student is ${s.getName}.");
}
```

Output

A screenshot of a Dart IDE window showing the output of a program. The window title is 'Yash Dart dart program24.dart'. The output displays the text 'The name of the student is Yash.'.

```
The name of the student is Yash.
```

25) Single Inheritance

Code

```
class Student {
    String sname = "";
    String sroll = "";
    void setDetails(String name, String roll) {
        sname = name;
        sroll = roll;
    }
}

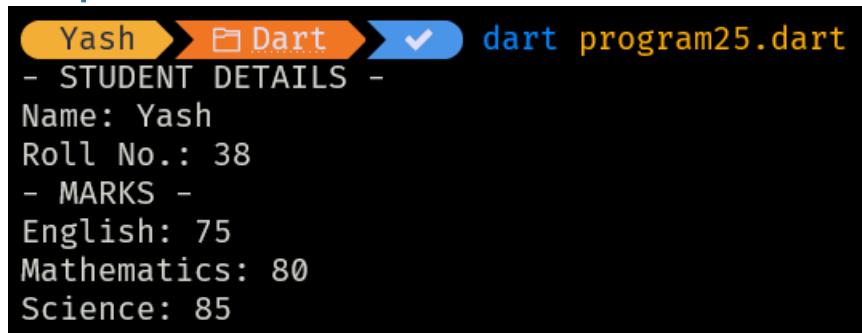
class Marks extends Student {
    void displayMarks() {
        int m1 = 75, m2 = 80, m3 = 85;
        print("- STUDENT DETAILS -");
    }
}
```

```

        print("Name: $sname");
        print("Roll No.: $sroll");
        print("- MARKS -");
        print("English: $m1");
        print("Mathematics: $m2");
        print("Science: $m3");
    }
}
void main() {
    Marks m = new Marks();
    m.setDetails("Yash", "38");
    m.displayMarks();
}

```

Output



```

Yash Dart ✓ dart program25.dart
- STUDENT DETAILS -
Name: Yash
Roll No.: 38
- MARKS -
English: 75
Mathematics: 80
Science: 85

```

26) Multilevel Inheritance

Code

```

class Student {
    String sname = "";
    String sroll = "";
    void setDetails(String name, String roll) {
        sname = name;
        sroll = roll;
    }
}

class Marks extends Student {
    int s1 = 0, s2 = 0, s3 = 0, s4 = 0, s5 = 0;
    void setMarks(int m1, int m2, int m3, int m4, int m5) {
        s1 = m1;
        s2 = m2;
        s3 = m3;
        s4 = m4;
        s5 = m5;
    }
}

class Report extends Marks {
    int total = 0;
    double avg = 0;
    void calculateMarks() {
        total = s1 + s2 + s3 + s4 + s5;
    }
}

```

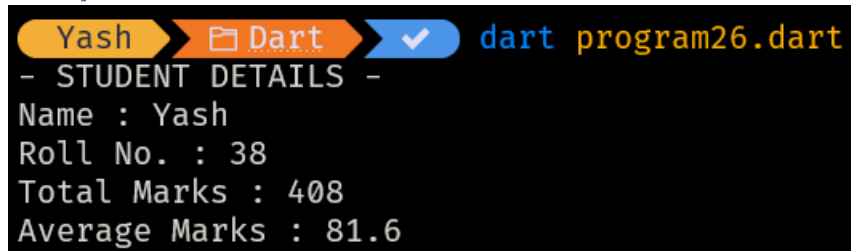
```

        avg = total / 5;
    }
    void displayReport() {
        print("- STUDENT DETAILS -");
        print("Name : $sname");
        print("Roll No. : $sroll");
        print("Total Marks : $total");
        print("Average Marks : $avg");
    }
}

void main() {
    Report r = new Report();
    r.setDetails("Yash", "38");
    r.setMarks(78, 80, 85, 75, 90);
    r.calculateMarks();
    r.displayReport();
}

```

Output



```

Yash Dart dart program26.dart
- STUDENT DETAILS -
Name : Yash
Roll No. : 38
Total Marks : 408
Average Marks : 81.6

```

27) Method Overriding

Code

```

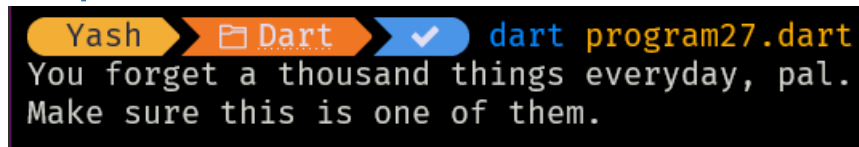
class Class1 {
    void method() {
        print("You forget a thousand things everyday, pal.");
    }
}

class Class2 extends Class1 {
    void method() {
        print("Make sure this is one of them.");
    }
}

void main() {
    Class1 c1 = new Class1();
    Class2 c2 = new Class2();
    c1.method();
    c2.method();
}

```


Output

A terminal window showing the output of a Dart program. The window has a dark background with light-colored text. At the top, there are three colored buttons: a yellow one with 'Yash', an orange one with 'Dart', and a blue one with a checkmark. To the right of these buttons is the text 'dart program27.dart'. Below this, the program's output is displayed: 'You forget a thousand things everyday, pal.' followed by 'Make sure this is one of them.' on the next line.

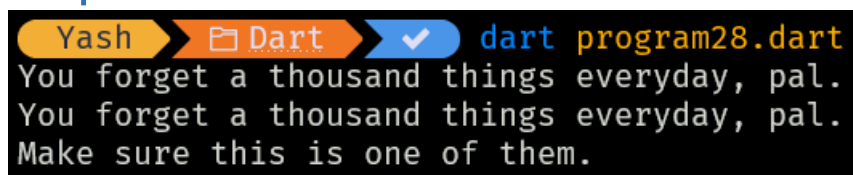
```
Yash Dart dart program27.dart
You forget a thousand things everyday, pal.
Make sure this is one of them.
```

28) Constructors w/ Inheritance

Code

```
class Class1 {
    Class1() {
        print("You forget a thousand things everyday, pal.");
    }
}
class Class2 extends Class1 {
    Class2() {
        print("Make sure this is one of them.");
    }
}
void main() {
    Class1 c1 = new Class1();
    Class2 c2 = new Class2();
}
```

Output

A terminal window showing the output of a Dart program. The window has a dark background with light-colored text. At the top, there are three colored buttons: a yellow one with 'Yash', an orange one with 'Dart', and a blue one with a checkmark. To the right of these buttons is the text 'dart program28.dart'. Below this, the program's output is displayed: 'You forget a thousand things everyday, pal.' followed by 'You forget a thousand things everyday, pal.' on the next line, and 'Make sure this is one of them.' on the third line.

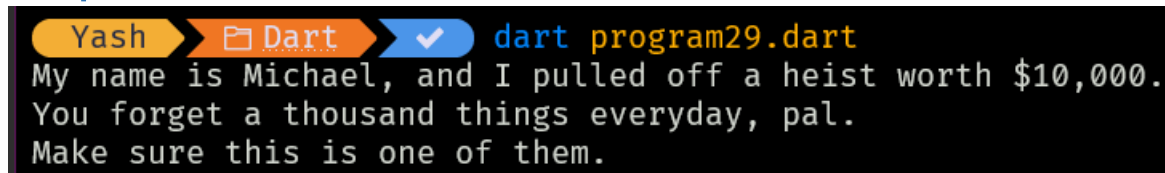
```
Yash Dart dart program28.dart
You forget a thousand things everyday, pal.
You forget a thousand things everyday, pal.
Make sure this is one of them.
```

29) Parameterized Constructors w/ Inheritance

Code

```
class Class1 {
    Class1(String name, String score) {
        print("My name is $name, and I pulled off a heist worth $score.");
        print("You forget a thousand things everyday, pal.");
    }
}
class Class2 extends Class1 {
    Class2(String name, String score):super(name, score) {
        print("Make sure this is one of them.");
    }
}
void main() {
    Class2 c2 = new Class2("Michael", "\$10,000");
}
```

Output

A terminal window showing the output of a Dart program. The title bar includes 'Yash', 'Dart', and 'dart program29.dart'. The output text is: 'My name is Michael, and I pulled off a heist worth \$10,000. You forget a thousand things everyday, pal. Make sure this is one of them.'

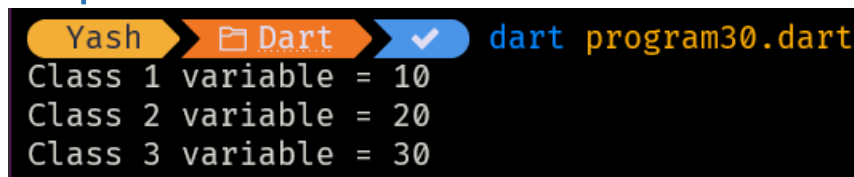
```
Yash Dart dart program29.dart
My name is Michael, and I pulled off a heist worth $10,000.
You forget a thousand things everyday, pal.
Make sure this is one of them.
```

30) Individual Parameterized Constructors w/ Inheritance

Code

```
class Class1 {
    Class1(int num1) {
        print("Class 1 variable = $num1");
    }
}
class Class2 extends Class1 {
    Class2(int num1, int num2):super(num1) {
        print("Class 2 variable = $num2");
    }
}
class Class3 extends Class2 {
    Class3(int num1, int num2, int num3):super(num1, num2) {
        print("Class 3 variable = $num3");
    }
}
void main() {
    Class3 c3 = new Class3(10, 20, 30);
}
```

Output

A terminal window showing the output of a Dart program. The title bar includes 'Yash', 'Dart', and 'dart program30.dart'. The output text is: 'Class 1 variable = 10', 'Class 2 variable = 20', and 'Class 3 variable = 30'.

```
Yash Dart dart program30.dart
Class 1 variable = 10
Class 2 variable = 20
Class 3 variable = 30
```

31) Passing Parameterized Constructors w/ Inheritance

Code

```
class Student {
    String sname = "";
    String sroll = "";
    Student(this.sname, this.sroll);
}
class Marks extends Student {
    int s1 = 0, s2 = 0, s3 = 0, s4 = 0, s5 = 0;
    Marks(String sname, String sroll, this.s1, this.s2, this.s3,
    this.s4, this.s5):super(sname, sroll);
}
class Report extends Marks {
    int total = 0;
    double avg = 0;
```

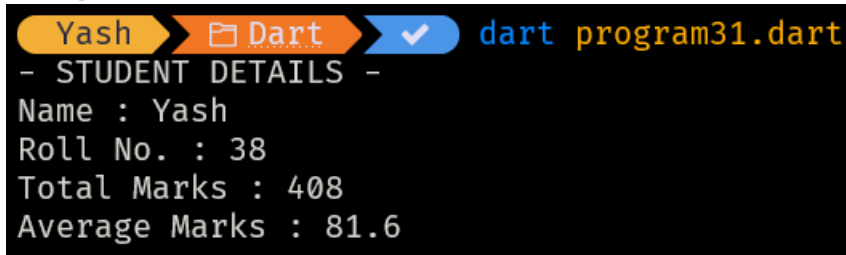
```

    Report(String sname, String sroll, int s1, int s2, int s3, int
s4, int s5):super(sname, sroll, s1, s2, s3, s4, s5);
    void calculateMarks() {
        total = s1 + s2 + s3 + s4 + s5;
        avg = total / 5;
    }
    void displayReport() {
        print("- STUDENT DETAILS -");
        print("Name : $sname");
        print("Roll No. : $sroll");
        print("Total Marks : $total");
        print("Average Marks : $avg");
    }
}

void main() {
    Report r = new Report("Yash", "38", 78, 80, 85, 76, 89);
    r.calculateMarks();
    r.displayReport();
}

```

Output



```

Yash Dart ✓ dart program31.dart
- STUDENT DETAILS -
Name : Yash
Roll No. : 38
Total Marks : 408
Average Marks : 81.6

```