LIST OF PROGRAMS
GETTING STARTED WITH C++

1. WAP to swap 2 values using 3rd variable.
2. WAP to print the sum of 2 values.
3. WAP to interchange 2 values without using 3rd variable.
4. WAP to find the square of a inputted number.
5. WAP to read temperature in Celsius and display it in Fahrenheit (F = (Ctemp * 9/5) + 32).
6. WAP to read temperature in Fahrenheit and display it in Celsius (C = (Ftemp - 32) * 5/9).
7. WAP to accept radius of a circle and print its area. (area = πr^2).
8. WAP to accept marks in 5 subjects and find its average marks.
9. WAP to calculate Simple Interest.
10. WAP to find the area of a square. (area = side*side).
11. WAP to find the area of a rectangle. (area = L * B).
12. WAP to output the number of notes of each denomination needed for a given amount if the total number of notes is required to be minimum.
13. WAP to check whether a given number is even or odd and print appropriate message
14. WAP to input a number and print the sum of its each digit.

DATA HANDLING

15. WAP to input height in centimeters and then convert it to feet and inches. (1 feet = 12 inches, 1 inch =2.54 cm.)
16. WAP to read a number n and print n^2, n^3, n^4 and n^5.
17. WAP to find area of a triangle.
18. WAP to convert given inches into equivalent yards, feet and inches. (1 yard = 36 inches, 1 feet =12 inches.)
19. WAP to find the volume of a cube. (volume = $side^3$)
20. WAP to find the volume of a cylinder. (Volume = $\pi r^2 h$)
21. WAP to find the volume of a sphere. (volume = $\frac{4}{3}\pi r^3$)
22. WAP to find the volume of a sphere. (volume = $\frac{1}{3}\pi r^2 h$)
23. WAP to find the square root of a inputted number.

OPERATORS & EXPRESSIONS IN C++
(use conditional operator where ever necessary)

24. WAP to raise any number X to the positive power n.
25. WAP to calculate compound interest. (C.I. = P(1+R/100)^N- P).
26. WAP to read two numbers and print their quotient and remainder.
27. WAP to input principal amount an time. If time is more than 10 yrs, calculate simple interest with rate 8%. Otherwise calculate it with rate 12% per annum.
28. WAP to input a number, and if the number is even print its square otherwise print its cube.
29. WAP to input a number. If number is odd and positive, print its square root else print n^5.
30. WAP to input choice(1 or 2). If choice is 1 print the area of circle, else print the perimeter of circle.
31. WAP to input three integers and print the largest of three.

LIST OF PROGRAMS
FLOW OF CONTROL

32. WAP to print numbers from 1 to N. (Program 10.13 from Text book).
33. WAP to print numbers from 1 to N in ascending and descending order.
34. WAP to print even numbers between 1 to N.
35. WAP to print odd number between 1 to N.
36. WAP to print whether the inputted character is Alphabet or not.
37. WAP to print maximum and minimum number out of 3 inputted number.
38. WAP to calculate factorial of an integer number.
39. WAP to check whether a number is prime or not (Program 10.20 from Text book).
40. WAP to print prime numbers between a range. (Obtain range limit from user)
41. WAP for temperature conversion that gives the user the option of converting Fahrenheit to Celsius or Celsius to Fahrenheit and depending upon the users choice carries out the conversion.
42. WAP to create the equivalent of four function calculator (Program 10.3 from text book).
43. WAP to print whether the given character is an uppercase or a lowercase character or a digit or a blank space or any other character. Use ASCII codes for it(Program 10.6 from text book).
44. WAP to input number of week's day (1 to 7) and translate to its equivalent name of the day of the week (Program 10.8 from text book).
45. WAP to calculate area of circle, a rectangle or a triangle depending upon user's choice (Program 10.9 from Text book).
46. WAP to perform arithmetic calculations using switch.
47. WAP to calculate the factorial of inputted number N using while loop.
48. WAP to calculate and print the sums of even and odd integers of the first N natural numbers using WHILE loop.
49. WAP to print whether the inputted number is palindrome or not. (use do … while loop) (Solution 16 from Text book).
50. WAP to print sum of negative numbers, sum of positive even numbers, sum of positive odd numbers from a list of numbers entered by the user. The list terminates when the number entered is zero.
51. WAP to print the value of N (N-R) !
52. WAP to print multiplication table of inputted number.
53. WAP to print whether the inputted year is a leap year or not.
54. WAP to print the Fibonacci series till N term.
55. WAP to check whether the entered number is Armstrong number or not.
    (i.e. $407 = 4^3 + 0^3 + 7^3$)
56. WAP to reverse a given number.
57. WAP to print all the Pythagorean triplets between a given range .
    (i.e. $a^3 + b^3 = c^3$)
58. WAP to find the integer square root of a given number without using inbuilt function.

59. WAP to print the following series till N terms:

```
1
1  2
1  2  3...
```

60. WAP to print the following series till N terms:

```
1
2  3
4  5  6...
```

61. WAP to print the following series till N terms:

```
1
2  3
3  4  5...
```

62. WAP to print the following series till N terms:

```
2
3  4
4  5  6...
```

63. WAP to print the following series till N terms:

```
5
4  5
3  4  5
2  3  4  5
1  2  3  4  5....
```

64. WAP to print the following series till N terms:

```
3  3  3........
2  2
1
```

65. WAP to print the following series till N terms:

```
1
2  2
3  3  3...
```

66. WAP to print the following series till N terms:

```
1  2  3...
1  2
1
```

67. WAP to print the following series till N terms:

```
1  2  3...
2  3
3
```

68. WAP to print the following series till N terms:

```
3  2  1...
2  1
1
```

69. WAP to print the following series till N terms:

```
3  4  5...
2  3
1
```

70. WAP to print the following series till N terms:

```
3   2   1 . . .
3   2
3
```

71. WAP to print the following series till N terms:

```
3   3   3 . . .
2   2
1
```

72. WAP to print the following series till N terms:

```
1
3   5
7   9   11 . . .
```

73. WAP to print the following series till N terms:

```
A
A   B
A   B   C . . .
```

74. WAP to print the following series till N terms:

```
A
B   C
D   E   F . . .
```

75. WAP to print the following series till N terms:

```
A
B   B
C   C   C . . .
```

76. WAP to print the following series till N terms:

```
A   B   C . . .
A   B
A
```

77. WAP to print the following series till N terms:

```
C   B   A . . .
C   B
C
```

78. WAP to print the following series till N terms:

```
C   B   A . . .
B   A
A
```

79. WAP to print the following series till N terms:

```
_ _ _ &
_ _ & _ &
_ & _ _ &
&  &  &  &
```

80. WAP to print the following series till N terms:

```
&&&&&&
 &&&&&
  &&&
    &
```

81. WAP to print the following series till N terms:

```
1
0   1
1   0   1
0   1   0   1 . . . .
```

82. WAP to print the following series till N terms:

```
1
0 0
1 1 1
0 0 0 0 ....
```

83. WAP to print the following series till N terms:

```
        1
    1       2
1       2       3 .
```

84. WAP to print the following series till N terms:

```
        1
    2       2
3       3       3 . . .
```

85. WAP to print the following series till N terms:

```
        1
    1   2   1
1   2   3   2   1
```

86. WAP to print the following series till N terms:

```
1   2   3 . . .
    2   3
        3
```

87. WAP to print the following series till N terms:

```
1   2   3 . . .
    1   2
        1
```

88. WAP to print the following series till N terms:

```
3   2   1 . . .
    2   1
        1
```

89. WAP to print the following series till N terms:

```
3   2   1 . . .
    3   2
        3
```

90. WAP to print the following series till N terms:

```
        1
    2       2
3   3   3
    2       2
        1
```

91. WAP to print the following series till N terms:

```
            1
        1   2   1
    1   2   3   2   1
        1   2   1
            1
```

93. WAP to print the following series till N terms:

```
A
B  B
C  C  C...
```

94. WAP to print the following series till N terms:

```
A  B  C...
A  B
A
```

94. WAP to print the following series till N terms:

```
          A
       A  B  C
    A  B  C  D  E
```

95. WAP to print the following series till N terms:

```
            1
         1  2
      1  2  3 ...
```

96. WAP to print the following series till N terms:

```
   1
2  2
3  3  3 ........
```

97. WAP to print the following series till N terms :

```
         3
      2  3
   1  2  3..........
```

98. WAP to print the following series : $1, -2, 3, -4, 5, -6, \ldots\ldots\ldots N$

99. WAP to print the following series : $1, 2, 4, 7, 11, 16, \ldots\ldots\ldots N$

100. WAP to print the sum of the following series: $1 + 2 + 3 + 4 + \ldots\ldots\ldots\ldots N$

101. WAP to print the sum of the following series: $2 + 4 + 6 + 8 + \ldots\ldots\ldots\ldots N$

102. WAP to print the sum of the following series: $1 + 3 + 5 + 7 + \ldots\ldots\ldots\ldots N$

103. WAP to print the sum of the following series: $1 + 3 + 6 + 10 + \ldots\ldots\ldots\ldots N$

104. WAP to print the sum of the following series: $1^2 + 2^2 + 3^2 + 4^2 + \ldots\ldots\ldots\ldots N$

105. WAP to print the sum of the following series: $1^2 + 4^2 + 7^2 + 10^2 + \ldots\ldots\ldots N$

106. WAP to print the sum of the following series: $1 + (1 * 3) + (1 * 3 * 5) + \ldots\ldots N$

107. WAP to print the sum of the following series: $A + AR + AR^2 + AR^3 + \ldots\ldots N$

USER DEFINED FUNCTIONS

WAP to swap the two values using call by value method.

WAP to swap the two values using call by reference method.

WAP to convert distance in feet or inches using call by reference method.

WAP to sum N natural numbers starting from a given number.

WAP that invokes a function calc() which takes 2 integers and an arithmetic operator as argument and prints corresponding result. (Pg : 312 , Q. 19)

WAP that takes 2 integer arguments and returns reference of the odd number of the two. If both the arguments are odd, then the reference of the smaller number is returned.

WAP that invokes a functions statics() to find whether 4 integers a,b,c,d passed as argument to it satisfy the equation $a^3 + b^3 + c^3 = d^3$ or not. The function returns 0 (zero) if the given equation is satisfied else returns -1. (Pg : 324, Q.2)

127. WAP that uses a function power() to raise a number m to power n. The function takes int values for m and n and returns the result correctly. Use a default value of 2 for n to make the function calculate square when argument n is omitted. (Pg : 3 24, Q.7)

128. WAP to do the following :

   a) Function sqlarge() that is passed 2 integer argument by reference and then sets the large of the 2 numbers to its square.

   b) Function sum() that is passed an integer argument by value and that returns the sum of the individual digits of the passed number.

   c) main() that exercises above 2 functions by getting 2 integers from the user and by printing the sum of the individual digits of the square of the large number.

129. WAP that uses a function called carea() to calculate area of circle. Function receives radius of float type and returns area of double type. The function main() gets a radius value from the user, calls area() , and displays the result. The function carea() is local to main().

130. WAP that invokes a function statis() to find whether four integers a,b,c,d sent to satis() satisfy the equation $a^3 + b^3 + c^3 = d^3$ or not. The function satis() returns 0 if the above equation is satisfied with the given four numbers otherwise it returns -1

130. WAP to input a string and convert upper case to lower case and lower case to upper case.
131. WAP to input 2 strings and compare both are equal or not.
132. WAP to read prices of 10 items in an array and then display sum of all the prices, product of all the prices and average of them. (Program 12.2 from Text Book.)
133. WAP to search for a specific element in a 1- D array. (Program 12.5 from Text Book.)
134. WAP to find the largest element from an array.
135. WAP to find the smallest element from an array.
136. WAP to sort the inputted array in ascending order.
137. WAP to sort the inputted array in descending order.
138. WAP to add 2 matrices.
139. WAP to subtract 2 matrices.
140. WAP to multiply 2 matrices.
141. WAP to find row sum and column sum of a matrix.
142. WAP to find the transpose of matrix.
143. WAP to check equality of two matrices.
144. WAP to check equality of two matrices.
145. WAP which will change all the values which are in multiples of 10 in the array to 10 and rest of the values in the array to 1.
146. WAP to add 1 in all the odd values and 2 in all the even values of the given 1D array.
147. WAP which will divide all those array elements by 7 which are divisible by 7 and multiply other array elements by 3.
148. WAP which will transfer the content from two arrays Array A and array B to array C. The even places of array C should get the content from the array A and odd places of array C should get the content from the array B.
149. WAP to transfer the content from one array A to two different array Odd and Even. The Odd array should contain the values from odd position of A and Even array should contain the values from even position of A.
150. WAP to merge a given array A in descending order and B in descending order into third array C in ascending order.
151. WAP to replace every space in a string with a hyphen.
152. WAP to find number of vowels in a given line of text.
153. WAP to check if a given string is a palindrome or not.
154. WAP to sum the element above and below the main diagonal of matrix.
155. WAP to concatenate two strings.
156. WAP to find a substring of a given string.
157. WAP to calculate length of a string without using a inbuilt function.
158. WAP to reverse a given string.
159. WAP to delete a substring from a given string.
160. WAP to count number of spaces in a given string.
161. WAP to count number of occurrences of a given character in a string.
162. WAP to print upper and lower triangle of a matrix.

LIST OF PROGRAMS(2017-18)

STRUCTURES

163. WAP to read values into a nested structure. (Program 13.1 from Text Book)
164. WAP to store information of 5 employees and to display information of an employee depending upon the employee number given. (Program 13.2 from Text Book)
165. WAP to illustrate the use of passing structure by value. (Program 13.4 from Text Book)
166. WAP to illustrate the use of passing structure by reference. (Program 13.5 from Text Book)
167. WAP to illustrate the use of # define preprocessor directive, typedef and macro.
168. WAP to receive 2 dates and display the new date after adding both the dates.
169. WAP to receive distance in the form of km and meter and add km and meter of 2 objects and display the new distance.
170. WAP to store name of country, country's capital and per capita income of the country using structure and do the following (Program 10 from Text Book of Long Answer Question)
    (a) To read a country's name and display capital and per capita income.
    (b) To read name of the capital city and displays country's name and display country's name and per capital income.
171. An array stores details of 10 students (rollno, name, marks in 5 subjects). Write a program to create such an array and print out a list of students who have failed in more than one subjects. Assume 40% as pass marks.