**Question 1:**

***BMI Categorizing***

The Body Mass Index (BMI) is defined as ratio of the weight of a person (in kilograms) to the square of the height ( in feet). Write a program that receives weight and height, calculates the BMI, and reports the BMI category as per the following table:

|  |  |
| --- | --- |
| **BMI Category** | **BMI** |
|  |  |
| Starvation | < 15 |
| Anorexic | 15.1 to 17.5 |
| Underweight | 17.6 to 18.5 |
| Ideal | 18.6 to 24.9 |
| Overweight | 25 to 25.9 |
| Obese | 30 to 30.9 |
| Morbidly Obese | >= 40 |

Input Format

**Sample Input 1:**

75 5.9

**Sample Output 1:**

BMI = 23.193680

Grade: Ideal

**Sample Input 2:**

Input the weight in kilograms:

79

Input the height in feet:

5.8

**Sample Output 2:**

BMI = 25.280375

Grade: Overweight

**Input Explanation:**

1st line depicts the user to input space separated 2 numbers

First number will represent the weight in kilogram and the second number will represent the height in feet. For example: 5 feet 9 inches ~ 5.9.

**Output Explanation:**

Displays the BMI value in first line

After an escape sequence(end of line) displays the Grade: in the second line.

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | 75  5.0 | 45  6.0 | 55  5.0 | 50  5.8 | 79  5.8 |
| **Output** | BMI = 32.294880  Grade: Obese | BMI = 13.456201  Grade: Starvation | BMI = 23.682913  Grade: Ideal | BMI = 16.000237  Grade: Anorexic | BMI = 25.280375  Grade: Overweight |

**Question 2:**

***Swapping Without Variable***

Write a simple program to swap the numbers of three variables without using the forth variable. Make a C program by taking three variables only of integer type.  The value of a will be swapped to b, and b’s value will be swapped to c and c to a respectively.

Note\* No additional variable or container type can be used, using only these 3 variables.

**Sample Input 1:**

Input 3 numbers to swap:

25 50 75

**Sample Output 1:**

Before Swap: a = 25, b =50 and c = 75

After Swap: a = 75, b = 25 and c = 50

**Sample Input 2:**

Input 3 numbers to swap:

10 49 3

**Sample Output 2:**

Before Swap: a = 10, b = 49 and c = 3

After Swap: a = 3, b = 10 and c = 49

**Input Explanation:**

1st line depicts the user to input 3 numbers

2nd line depicts the input to three variables- a, b, c

**Output Explanation:**

Display the values before swapping occurs in first line

After an escape sequence displays the values after swapping of the variables

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | 10 20 30 | 21 40 37 | 65 74 32 | 52 3 18 | 28 90 190 |
| **Output** | Before Swap: a = 10, b =20 and c = 30  After Swap: a = 30, b = 10 and c = 20 | Before Swap: a = 21, b =40 and c = 37  After Swap: a = 37, b = 21 and c = 40 | Before Swap: a = 65, b =74 and c = 32  After Swap: a = 32, b = 65 and c = 74 | Before Swap: a = 52, b =3 and c = 18  After Swap: a = 18, b = 52 and c = 3 | Before Swap: a = 28, b =90 and c = 190  After Swap: a = 190, b = 28 and c = 90 |

**Question 1:**

***Gift Coupon Check***

Suresh had completed his monthly purchase and paid the bill. At customer desk there was an offer board which mentioned that if the bill numbers addition is divisible by 5, then they will get a Gift Coupon worth Rs. 500. Write a program and Help Suresh to decide whether his bill number is eligible for Gift Coupon or not.

**Sample Input 1:**

Input a number

12345

**Sample Output 1:**

Bill Number 12345 is Eligible For Gift Coupon

**Sample Input 2:**

Input a number

12344

**Sample Output 2:**

Bill Number 12344 is Not Eligible For Gift Coupon

**Input Explanation:**

**1 <= Input number(n) < 100000**

1st line depicts the user to input a number

2nd line depicts the input to a number

**Output Explanation:**

Displays whether the sum of numbers is divisible by 5 or not.

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | 96 | 555 | 2869 | 24 | 876 |
| **Output** | Bill Number 96 is Eligible for Gift Coupon | Bill Number 555 is Eligible for Gift Coupon | Bill Number 2869 is Eligible for Gift Coupon | Bill Number 24 is Not Eligible for Gift Coupon | Bill Number 876 is Not Eligible for Gift Coupon |

**Question 2:**

***Subject Grading***

Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer, calculate percentage and grade according to given conditions:

|  |  |
| --- | --- |
| Percentage | Grade |
|  |  |
| If Percentage >= 90% | Grade: A |
| If Percentage >= 80% | Grade: B |
| If Percentage >= 70% | Grade: C |
| If Percentage >= 60% | Grade: D |
| If Percentage >= 40% | Grade: E |
| If Percentage < 40% | Grade: F |

**Sample Input 1:**

Input the marks of 5 subjects:

40 60 29 80 76

**Sample Output 1:**

Percentage = 57.00 %

Grade: E

**Sample Input 2:**

Input the marks of 5 subjects:

100 100 100 100 100

**Sample Output 2:**

Percentage = 100 %

Grade: A

**Input Explanation:**

**0 <= Input number(n) <= 100**

1st line depicts the user to input a number

2nd line depicts the input to a number

**Output Explanation:**

Displays whether the sum of numbers is divisible by 5 or not.

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | 20 38 39 54 39 | 29 45 54 76 69 | 45 56 89 98 91 | 94 46 30 68 98 | 78 90 34 56 21 |
| **Output** | Percentage = 38.00 %  Grade: F | Percentage = 54.60 %  Grade: E | Percentage = 75.80 %  Grade: C | Percentage = 67.20 %  Grade: D | Percentage = 83.60 %  Grade: B |

**Question 1:**

Write a C program to input a character from user and check whether the given character is alphabet or not.

**Sample Input 1:**

Input character: a

**Sample Output 1:**

Character is an ALPHABET.

**Sample Input 2:**

Input character: @

**Sample Output 2:**

Character is NOT ALPHABET.

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | A | B | % | L | # |
| **Output** | Character is an ALPHABET | Character is an ALPHABET | Character is NOT ALPHABET | Character is an ALPHABET | Character is NOT  ALPHABET |

**Question 2:**

Write a C program to input any number from user and check whether the given number is positive, negative or zero

**Sample Input 1:**

Input number: 23

**Sample Output 1:**

Number is POSITIVE

**Sample Input 2:**

Input number: -23

**Sample Output 2:**

Number is NEGATIVE

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | 1 | 0 | -56 | 8 | 101 |
| **Output** | Number is POSITIVE | Number is ZERO | Number is NEGATIVE | Number is POSITIVE | Number is POSITIVE |

**Question 3:**

Write a C program to input character from user and check whether character is uppercase or lowercase alphabet

**Sample Input 1:**

Input character: C

**Sample Output 1:**

‘C’ is uppercase alphabet.

**Sample Input 2:**

Input character: c

**Sample Output 2:**

‘c’ is lowercase alphabet.

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | A | B | K | o | m |
| **Output** | ‘A’ is uppercase alphabet. | ‘B’ is uppercase alphabet. | ‘K’ is uppercase alphabet. | ‘o’ is lowercase alphabet. | ‘m’ is lowercase alphabet. |

**Question 4:**

Write a C program to enter month number between (1-12) and print number of days in month

**Sample Input 1:**

Enter month number: 1

**Sample Output 1:**

31 Days in this Month

**Sample Input 2:**

Enter month number: 9

**Sample Output 2:**

30 Days in this Month.

**Sample Input 3:**

Enter month number: 2

**Sample Output 3:**

Either 28 or 29 Days in this Month.

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test Case 1** | **Test Case 2** | **Test Case 3** | **Test Case 4** | **Test Case 5** |
| **Input** | 1 | 2 | 4 | 3 | 6 |
| **Output** | 31 Days in this Month | Either 28 or 29 Days in this Month. | 30 Days in this Month. | 31 Days in this Month | 30 Days in this Month. |