Presidential Initiative for Artificial Intelligence and Computing (PIAIC)

https://www.piaic.org

Internet of Things (IoT) Specialist Program

Rust Programming Assignment Set 1

Quarter I:

IoT-101 Fundamentals of Programming using Rust

Second Quarter 2019 (12 Weeks)

1. **Calculate Area of a Circle**
   Write a Rust program, which accepts the radius of a circle from the user and computes the area.

   Program Console Sample Output 1:
   Input Radius: 0.5
   Area of Circle with radius 0.5 is 0.7853981634

   References:
   https://www.mathsisfun.com/geometry/circle-area.html

2. **Check Number either positive, negative or zero**
   Write a Rust program to check if a number is positive, negative or zero

   Program Console Sample Output 1:
   Enter Number: -1
   Negative Number Entered

   Program Console Sample Output 2:
   Integer: 3
   Positive Number Entered

   Program Console Sample Output 3:
   Integer: 0
   Zero Entered

3. **Divisibility Check of two numbers**
   Write a Rust program to check whether a number is completely divisible by another number. Accept two integer values form the user

   Program Console Sample Output 1:
   Enter numerator: 4
   Enter Denominator: 2
   Number 4 is Completely divisible by 2

   Program Console Sample Output 2:
   Enter numerator: 7

Enter Denominator: 4
Number 7 is not Completely divisible by 4

4. **Calculate Volume of a sphere**
   Write a Rust program to get the volume of a sphere, please take the radius as input from user

   Program Console Output:
   Enter Radius of Sphere: 1
   Volume of the Sphere with Radius 1 is 4.18

   Reference:
   https://keisan.casio.com/exec/system/1223372883

5. **Copy string n times**
   Write a Rust program to get a string which is n (non-negative integer) copies of a given string.

   Program Console Output:
   Enter String: Hi
   How many copies of String you need: 4
   4 Copies of Hi are HiHiHiHi

6. **Check if number is Even or Odd**
   Write a Rust program to find whether a given number (accept from the user) is even or odd, print out an appropriate message to the user

   Program Console Output 1:
   Enter Number: 4
   4 is Even

   Program Console Output 2:
   Enter Number: 9
   9 is Odd

7. **Vowel Tester**
   Write a Rust program to test whether a passed letter is a vowel or not

   Program Console Output 1:
   Enter a character: A
   Letter A is Vowel

   Program Console Output 2:
   Enter a character: e
   Letter e is Vowel

   Program Console Output 2:
   Enter a character: N
   Letter N is not Vowel

8. **Triangle area**
   Write a Rust program that will accept the base and height of a triangle and compute the area

   Program Console Sample 1:
   Enter magnitude of Triangle base: 4
   Enter Magnitude of Triangle Height: 4
   Area of a Triangle with Height 4 and Base 4 is 8

   Reference:

9. **Calculate Interest**
   Write a Rust program to compute the future value of a specified principal amount, rate of interest, and a number of years

   Program Console Sample 1:
   Please enter principal amount: 10000
   Please Enter Rate of interest in %: 0.1
   Enter number of years for investment: 5
   After 5 years your principal amount 10000 over an interest rate of 0.1 % will be 16105.1

10. **Euclidean distance**
    Write a Rust program to compute the distance between the points (x1, y1) and (x2, y2).

    Program Console Sample 1:
    Enter Co-ordinate for x1: 2
    Enter Co-ordinate for x2: 4
    Enter Co-ordinate for y1: 4
    Enter Co-ordinate for y2: 4
    Distance between points (2, 4) and (4, 4) is 2

    Reference:
    https://en.wikipedia.org/wiki/Euclidean_distance

11. **Feet to Centimeter Converter**

    Write a Rust program to convert height in feet to centimetres.

    Program Console Sample 1:
    Enter Height in Feet: 5
    There are 152.4 Cm in 5 ft

    Reference:

    https://www.rapidtables.com/convert/length/feet-to-cm.html

12. **BMI Calculator**
    Write a Rust program to calculate body mass index

    Program Console Sample 1:
    Enter Height in Cm: 180
    Enter Weight in Kg: 75
    Your BMI is 23.15

    Reference:

    https://www.thecalculatorsite.com/articles/health/bmi-formula-for-bmi-calculations.php

13. **Sum of n Positive Integers**
    Write a Rust program to sum of the first n positive integers

    Program Console Sample 1:
    Enter value of n: 5

Sum of n Positive integers till 5 is 15

14. **Digits Sum of a Number**
    Write a Rust program to calculate the sum of the digits in an integer

    Program Console Sample 1:
    Enter a number: 15
    Sum of 1 + 5 is 6

    Program Console Sample 2:
    Enter a number: 1234
    Sum of 1 + 2 + 3 + 4 is 10

15. **Decimal to Binary Converter**
    Write a Rust program to convert an decimal integer to binary

    Program Console Sample 1:
    Enter a decimal number: 5
    Binary Representation of 5 is 101

    Program Console Sample 2:
    Enter a decimal number: 32
    Binary Representation of 32 is 100000

    Reference:

    https://www.rapidtables.com/convert/number/decimal-to-binary.html

16. **Binary to Decimal Converter**
    Write a program to convert binary number to Decimal number

    Program Console Sample 1:
    Enter a Binary number: 1101
    Decimal Representation of 1101 is 13

    Program Console Sample 2:
    Enter a Binary number: 1001
    Decimal Representation of 1001 is 9

    Reference:

    https://www.rapidtables.com/convert/number/binary-to-decimal.html

17. **Vowel and Consonants Counter**
    Input a text and count the occurrences of vowels and consonant

    Program Console Sample 1:
    Enter text: QuickBrownFoxJumpsovertheDog

    Vowels: 9
    Consonants: 19

18. **Palindrome tester**
    Write a program to check whether given input is palindrome or not

    Program Console Sample 1:
    Enter text: AHA
    Text AHA is Palindrome

Enter text: Hello
Text Hello is not a Palindrome

19. **Count Alphabets, Numbers and Special Characters**
    Write a Rust program that accepts a string and calculate the number of digits and letters

    Program Console Sample 1:
    Enter text: Rust 3.2
    Numbers = 2
    Alphabets = 6
    Special Characters = 1
    Spaces = 1

20. **Write a Rust program to construct the following pattern**

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```


21. **Write a Rust program to construct the following pattern**

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


22. **Write a Rust program to construct the following pattern**

```
1
22
333
4444
55555
666666
7777777
88888888
999999999
```

23. **Days Calculator**
    Write a Rust program to calculate number of days between two dates

    Program Console Output:
    Enter a date in (dd/mm/yy) format: 12/12/2018
    Enter a date in (dd/mm/yy) format: 16/12/2018
    There are 4 days in between 12/12/2018 and 16/12/18

    Reference:
    https://crates.io/crates/chrono