

```
# from tkinter import *
```

```
while True:
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```
    print("\nDo you want to proceed? Press Y to 'Yes' or N for 'No'")
```

```
    choice = input("User preference! Y/N : ")
```

```
    print("\n")
```

```
    if choice == "Y" or choice == "y" or choice == "yes" or choice == "Yes" or choice == "YES":
```

```
        aM = len('Mach no. calculation tool')
```

```
        print(f"#{59*'-'}+")
```

```
        print(f"|{int((59-aM)/2)*' '}Mach no. calculation tool{int((59-aM)/2)*' '}|")
```

```
        print(f"#{59*'-'}+")
```

```
        print('')
```

The Mach number is a dimensionless quantity representing the ratio of the actual fluid velocity to its speed of sound.

```
        ''')
```

```
        print("\nUser input data in Numbers or Floating value with decimal point:")
```

```
        V = float(input("Fluid velocity (m/s): "))
```

```
        k = float(input("k-constant (-): "))
```

```
        Z = float(input("Compresibility (-): "))
```

```
        T = float(input("Fluid temperature (degC): "))
```

```
        mw = float(input("Mole weight (kg/kmol): "))
```

```
        # Sonic velocity calculation
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```
        vSonic = (91.1811 * (k*Z*(T+273.15)/mw)**0.5)
```

```
        vSonic = round(vSonic, 6)
```

```
        # Mach No. calculation
```

```
        Mach = V / vSonic
```

```
        Mach = round(Mach, 6)
```

```
        print(f"Sonic velocity: {vSonic}, m/s")
```

```
        print(f"Mach no.: {Mach}, (-)")
```

```

    print("\nMach No. is calculated based on following equation:\n-----
\nMach no. = V(media speed) / C(sound speed) \nV / [91.1811 * sqrt(kZT/MW)] \n-----
----- \nInput parameters: \n*****\nVelocity (m/s): " + str(
    V) + "\nk (-): " + str(k) + "\nZ (-): " + str(Z) + "\nTemperature (degC): " + str(T) + "\nMole Weight (kg/kmole):" +
    str(mw) + "\nSound Speed (m/s):" + str(vSonic) + "\n----- \n\nResult Mach No
(-): " + str(Mach) + "\n\n-----\nCalculation tool developed in Python
coding!\n\n")

```

```

aW = len('Warning message')
bW = len('Information message')

```

```

if Mach > 1.0:
    print(f"{59*'-'}+")
    print(f"|{int((59-aW)/2)*' '}Warning message{int((59-aW)/2)*' '}|")
    print(f"{59*'-'}+")
    print("-=> Mach no. is greater than 1.0; Sonic velocity \n")

```

```

else:
    print(f"{59*'-'}+")
    print(f"|{int((59-aW)/2)*' '}Warning message{int((59-aW)/2)*' '}|")
    print(f"{59*'-'}+")
    print("-=> None \n")

```

```

print(f"{59*'-'}+")
print(f"|{int((59-bW)/2)*' '}Information message{int((59-bW)/2)*' '}|")
print(f"{59*'-'}+")

```

```

for i in range (9, 0, -1):
    i = round(i * 0.1, 1)
    print(f"-=> Mach no. is {i} @ fluid velocity of {round(i*vSonic, 1)}, m/s")

```

```

elif choice == "N" or choice == "n" or choice == "no" or choice == "No" or choice == "NO":
    input('Press ENTER to exit!')
    break

```

```

else:
    print("Select valid option! Y/N")

```