**1.** Massasi *m* = 100g va balandligi *h* = 10 сm bo‘lgan silindr shaklidagi yupqa stakan ikkinchi bir idishning silliq tubiga ag‘darib qo‘yildi va shundan so‘ng ikkinchi idishga asta sekin *H* = 20 сm balandlikkacha suv quyildi. Stakan suza boshlashi uchun suvni necha gradusgacha qizitish kerak. Stakanning diametri *d*=4 cm. Butun tizimning boshlang‘ich temperaturasi T = 300 K, atmosfera bosimi *po* = 720 mm.sim.ust.ga teng.

**Yechish:**

Stakanga, u suza boshlagan paytdagi, ta‘sir etuvchi kuch

*F1* = [*po* + *ρg* (*H - h*)]*S* (1)

bu yerda , po − atmosfera bosimi, *ρ* − suvning zichligi, *S* − stakan tubining yuzasi, *d* − stakanning diametri; *mg* − stakanga ta‘sir etuvchi og‘irlik kuchi (stakandagi havo massasini hisobga olmasa ham bo‘ladi);

stakandagi havoning bosim kuchi

*F2* = *p1S* (2)

Stakan suzishi uchun quyidagi shart bajarilishi kerak:

*F2 ≥ F1 + mg*.

Vertikal o‘qqa proyeksiyani muvozanatlik sharti:

*F1 − F2* + *mg* =0 (3)

Gaz o‘zgarmas hajmda qizitiladi, shuning uchun 

bu yerda *T1* =*T* + Δ*T* , bundan  (4)

ni olamiz. Bunga kuch va bosimni (1), (2) va (4) lardagi ifodalarini qo‘yib quyidagini olamiz:

. (5)

 ekanigini inobatga olib, (5) dan ∆*T* uchun quyidagi ifodani olamiz:



Bunga son qiymatlarni qo‘yamiz:

**Javob:** ΔT = 5К

from tkinter import \*  
from tkinter.ttk import Separator  
  
  
def solution():  
 *"""Dasturning asosiy funksiyasi. Bunda m, h, H, d va T qiymatlar kiritiladi.  
 Qo'yilgan masala yuzasidan hisob kitoblar amalga oshiriladi."""* def count\_result():  
 *""""Asosiy hisoblash uchun funksiya"""* try:  
 massa = int(m.get()) \* 0.001  
 high = int(h.get()) \* 0.01  
 High = int(H.get()) \* 0.01  
 diameter = int(d.get()) \* 0.01  
 Temp = int(T.get())  
 result\_1 = 1000 \* (High - high) + (4 \* massa) / (3.14 \* (diameter \*\* 2))  
 result\_2 = (Temp \* 9.8) \* (result\_1 / (13600 \* 9.8 \* 0.72))  
 result['text'] = f"Stakanni {'{:.2f}'.format(result\_2)} K ga qizitish kerak."  
  
 except ValueError:  
 result['text'] = f"Qiymatlarni kiritishda hatolik bor."  
  
 root = Tk()  
 root.geometry("820x560")  
 root.title("Program 1.")  
 root.configure(bg="#FFFFCC")  
 label\_1 = Label(root,  
 text="Massasi m (g) va balandligi h (сm) bo‘lgan silindr shaklidagi yupqa stakan \n"  
 "ikkinchi bir idishning silliq tubiga ag‘darib qo‘yildi va shundan so‘ng \n"  
 "ikkinchi idishga asta sekin H (сm) balandlikkacha suv quyildi. Stakan suza \n"  
 "boshlashi uchun suvni necha gradusgacha qizitish kerak. Stakanning diametri \n"  
 "d (cm). Butun tizimning boshlang‘ich temperaturasi T (K), atmosfera bosimi \n"  
 "po = 720 mm.sim.ust.ga teng.")  
  
 label\_1.config(bg="#FFFFCC", font=('Helvetica', 14))  
 label\_1.pack()  
 separator = Separator(root, orient='horizontal')  
 separator.pack(fill='x')  
  
 label\_s1 = Label(root, text="Birinchi stakanning massasi m(g)", font=('Helvetica', 14), bg="#FFFFCC")  
 label\_s1.pack()  
 m = Entry(root, font=("Helvetica", 14))  
 m.pack(padx=7, pady=5)  
  
 label\_s2 = Label(root, text="Birinchi stakanning balandligi h(cm)", font=('Helvetica', 14), bg="#FFFFCC")  
 label\_s2.pack()  
 h = Entry(root, font=("Helvetica", 14))  
 h.pack(padx=7, pady=5)  
  
 label\_s3 = Label(root, text="Ikkinchi stakandagi suv balandligi H(cm)", font=('Helvetica', 14), bg="#FFFFCC")  
 label\_s3.pack()  
 H = Entry(root, font=("Helvetica", 14))  
 H.pack(padx=7, pady=5)  
  
 label\_s4 = Label(root, text="Stakanning diametri d(cm)", font=('Helvetica', 14), bg="#FFFFCC")  
 label\_s4.pack()  
 d = Entry(root, font=("Helvetica", 14))  
 d.pack(padx=7, pady=5)  
  
 label\_s5 = Label(root, text="Tizimning dastlabki temperaturasi T(K)", font=('Helvetica', 14), bg="#FFFFCC")  
 label\_s5.pack()  
 T = Entry(root, font=("Helvetica", 14))  
 T.pack(padx=7, pady=5)  
  
 result = Label(root, text="", font=('Helvetica', 14), bg="#FFFFCC")  
 result.pack()  
  
 button\_3 = Button(root, text="Natijani ko'rish", font=('Helvetica', 14), command=count\_result)  
 button\_3.pack()  
 space\_2 = Label(root, text="", bg="#FFFFCC")  
 space\_2.pack()  
 root.bind("<x>", count\_result)  
  
 root.mainloop()  
  
  
if \_\_name\_\_ == "\_\_main\_\_":  
 solution()

