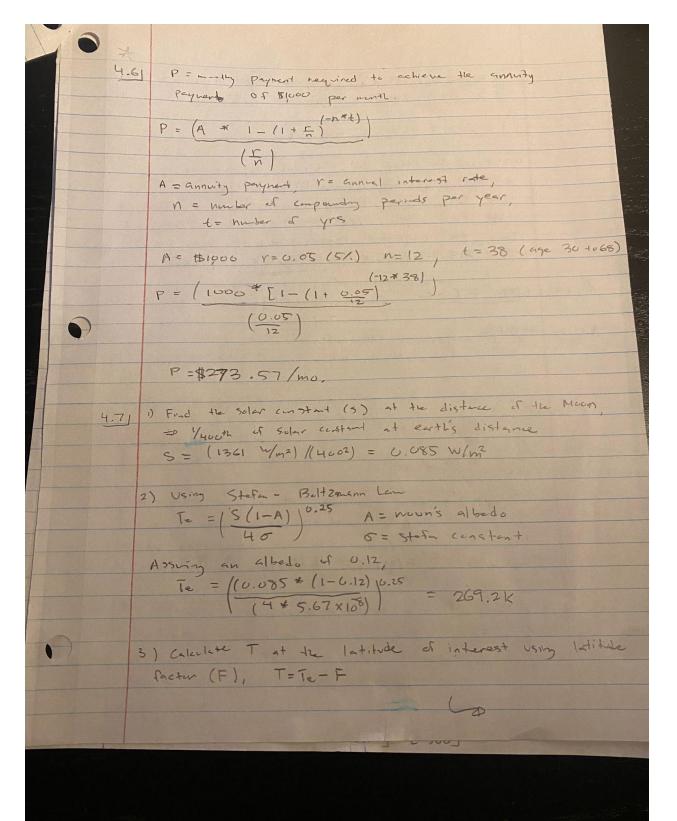
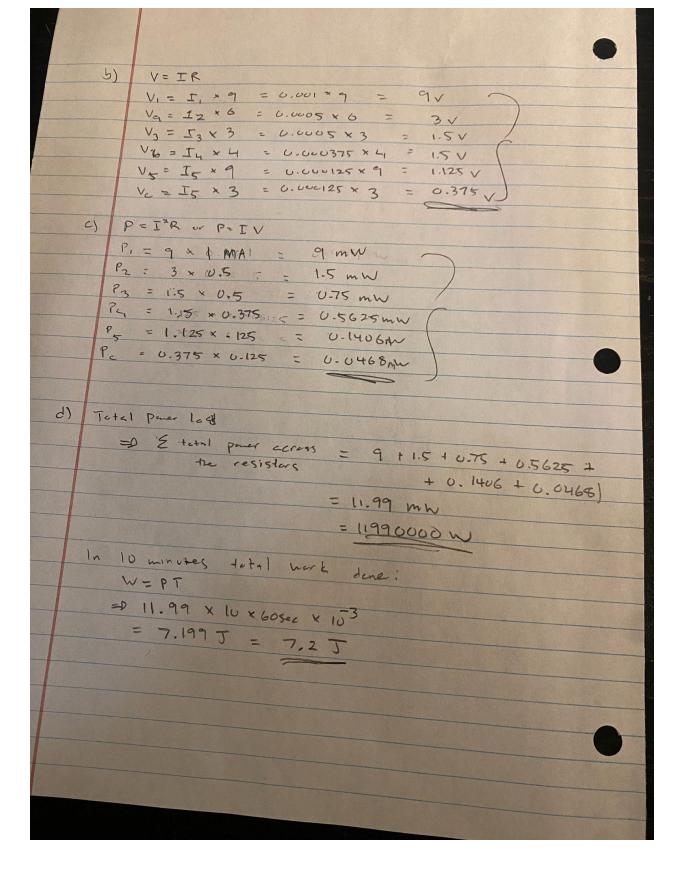
		_
		3.31 4: = 4 + bx; +ei
		The state of the s
		Versionse regression predictor Variable coefficients Variable
		mininize Ssres = Z(y; -q-bxi)2
		dssres = -2 \((Y; -9 -bxi) = 0
		1ssres
		155res2 & (4i - 9 - 6xi)xi = 0
-		a= (24 bexi) b= (n & xi yi - Ex. & Yi)
		1
		b = cov(x, yi)
0)	(Var(XI)
		Geovernance between Xi and y;
		Var(xi) is variance of Xi
	3111	
	2.4)	Code
	4.1)	Description - An MI4 gun is shot vertically upward with
		a muzzle belocky of 853 m/s. The tip of the gun bure is 3 meters from the ground, he want to
		bure is is meters tra the growth. he want to
		predict the naximu height the brillet can reach and
		the time it takes to neturn to the grand.
		Abstraction:
		he can nodel the notion of the bullet using kinematic
		equations, he will neglect air resistance.
		bet hith be height of bulled at time t
		Vo be the muzzle velocity of brillet
		I be the acceleration due to graving (-9.81 M/52
		1) 13-

Equations: Using kinemetre equation for vertical metion, h(+) = Vot - (1/2)gt2 as max height, the velocity of bothet is 0 Max height a timex = Volg Substitute into height equation lmax height -> hmax = Vo /29 Solution: tom= (853 m/s) - 86.95 $h_{msx} = \frac{(853 \text{ m/s})^2}{(2.9.81 \text{ m/s}^2)} = 38,873 \text{ m}$ Interpretation: The neximum height the bullet can reach is 38, 873 m, which is higher than the height of the earths atmosphere. This result is unreg listic Since we neglected air resistante. The time it takes for the bulled to return to the ground is twice the time to neach the maximum height which is approximately 173.8 seconds. Sensitivity Analysis: Since he neglected hir resistances in our model, our predictions for the maximum height and time of flaght are likely to be unrealistic. To obtain accurate predictions, he would need to grown for air resistance. And also consider small variations in the muzzle velocity or initial height.



F = 60 sin (latitude)? + 40 sin (latitude) $F = 60 \sin (30)^2 + 40 \sin (30) = 54$ T = 269.2 -54 = 215.2 k 4.). Adjust the temp for time of day using the divinal temperature range (DTR) factor. The DTR varies topending on the luner phase but for a first approximation, we can assure 0.5 This the estimated temperature 47 3:00 PM 13 T = 215.2 - (0.5 + Ta) = 126.4 K ((ube) 6) EBM + Code = (Made)

5.11 9) Esde 9/50 0 Use Kircheffs Voltage Lon: +12 - I, ×9 -6 × I2 = 0 9 x I, + 6 x I2 = 12 + t2 × 6 - I3 × 3 - I4 × 4 = 0 +6 × I2 + (-3) × I3 + (-4 × I4) = 0 + G I 2 + (-3) I3 + (-4) I4 = 0 + 4 × I4 - 9 × I- - 3 × Iz = 0 4 × I4 - 12 × I5 = 0 44 I4 + (-12) I5 = U $I_1 = I_2 + I_2 \implies I_1 + (-1)I_2 + (-1)I_3 = 0$ $I_3 = I_4 + J_7 \implies I_3 + (-1)I_4 + (-1)I_7 = 0$ 9 x I, + G I2 = 12 91, + 612 + 0 + 0 + 0 = 0.012 0 + 6I2 + (-3) I3 + (-4) I4 + 0 = 0 0 +0 +0 + 4 Iy + (-12) I = 0 I, + (-) I2 + (-) I3 + 0 + 0 = 0 0 + 0 + I3 + 1-) I4 + 6) I+=0 Using pythm = + = 0.001A I2= 0.000 × A 13 = 0.000 A 14 = 0.000 375 A I= = 0.000125A



5.2	2Cg H18(l) + 2502 (g) -> 16 (02(g) + 18 H20 (g)
5.4	

5.4 a) Using the Leantif production under helps to express the final deciend met by what is I he suppose X is the production in each sector X = [a m h]', where a = egricultural, m=menufacturing, he household production. Next, he can create a technology metrix A, where $A = \begin{bmatrix} 0.245 & 0.102 & 0.051 \\ 0.099 & 0.291 & 0.279 \\ 0.433 & 0.372 & 0.011 \end{bmatrix}$ the demand metrix can be denoted, D. where D = [Da Dm Dn] The demend will be the net production in the economy written as D = X - AX = (I-A) X b) So, D = (I-A) X = can also be in dermi of x, where x = (I-A) D, representing the production pregulat to meet reach given demand in each sector (Da, Dm Dn) X - AX represents the net production in the economy as stated in (6). The matrix Ax represents the requirements to produce the arunt in each sector, X. For exaple, he can use 100 units for sgricultural of horsehold. Then we know D = [100 200 300] Then we can show X=(T-A) D, $X = \begin{bmatrix} 1 - 6.245 & 6 - 0.162 & 6 - 6.651 \\ 0 - 6.617 & 1 - 0.241 & 0 - 0.277 \\ 0 - 0.433 & 0 - 0.372 & 1 - 6.611 \end{bmatrix} \begin{bmatrix} 100 \\ 200 \\ 300 \end{bmatrix}$ -0

After dung calculations + netrix williplication ve obtain X = [250.6] 362.8 624.7 Thos, in our given example ne how have values of units for egricultural, manufacturity, + house hall products. (In billions). According to the "Leontier-BLS Partnership" In 1932, leonties arrived at Hervard ad began the unusual project of constructing a 'tableau économique for the U.S. This was the first input - output tables which helped to analyze how changes such as an increase in spending on laxuries, would affect the net product of France and its distribution aring verious French social classes (bls.gov). In 1947, the Bureau's work with beantief had a number of effects on the Agency as the computer inverted 1947 matrix was still being assembled. 5.8 | Code