

16) (20 pts) Amino acids are organic compounds that contain amine and carboxyl functional groups, along with a side chain specific to each amino acid. The Table below shows the types of amino acids with their three and one letter codes.

Amino acid	Three letter code	One letter code	
alanine	ala	A ✓	1
arginine	arg	R ✓	2
asparagine	asn	N ✓	3
aspartic acid	asp	D ✓	4
asparagine or aspartic acid	asx	B	5
cysteine	cys	C ✓	6
glutamic acid	glu	E ✓	7
glutamine	gln	Q ✓	8
glutamine or glutamic acid	glx	Z	9
glycine	gly	G ✓	10
histidine	his	H ✓	11
isoleucine	ile	I ✓	12
leucine	leu	L ✓	13
lysine	lys	K ✓	14
methionine	met	M ✓	15
phenylalanine	phe	F ✓	16
proline	pro	P ✓	17
serine	ser	S ✓	18
threonine	thr	T ✓	19
tryptophan	trp	W ✓	20
tyrosine	tyr	Y ✓	21
valine	val	V ✓	22

Find on Blackboard, a data file named 'AAsequenceData.txt' of amino acids one letter codes. The first line has an integer which represents the total number of amino acids that follow, one per line.

Your task is to write a FORTRAN program that reads the file and counts the different number of amino acids present. Write your output to a file and present your results in a **table** and also make a **well labeled histogram plot** representing the amino acid types (The three letter code) on the horizontal axis and the amino acids counts on the vertical axis. Finally, write a short report and upload your code and report on blackboard.

This program took a long time. Fortunately, I think the program works right. I also think that more amino acids could be easily added and the program would still run great. I did my best to read in the function pretending like I didn't know how many acids were present. The material is written on a .xlsx and .pdf.