1. Write a program that takes a four-digit integer as a command line input. The script should give elegant message if the input is not an integer of right width or a float or a string. Convert the four-digit integer to a string based on the following rules for replacement:

Digit	Characters to replace
0	0
1	1
2	A or B or C
3	D or E or F
4	G or H or I
5	J or K or L
6	M or N or O
7	P or Q or R or S
8	T or U or V
9	W or X or Y or Z

Generate all the combinations of four-character words that are possible for the given input. [5 Mark]
Output required: The code, screenshots showing error response, list of words for two different inputs.
Application: One can remember a four-digit PIN using a word or acronym that could mean something for the user.
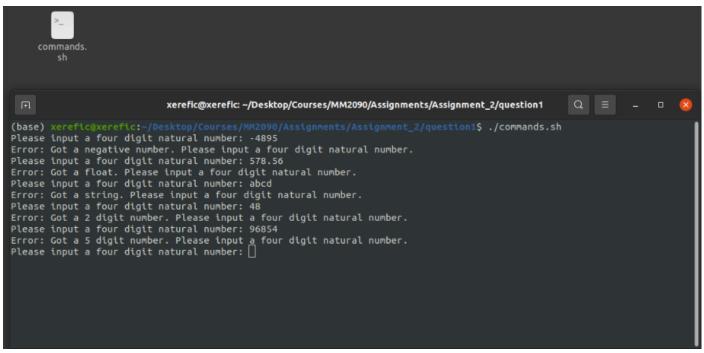
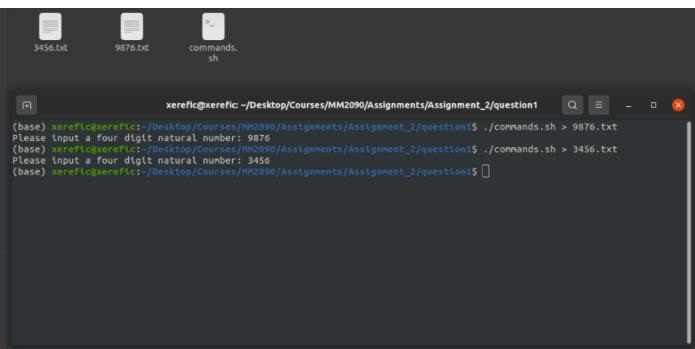Link to the GitHub repository for this question: GitHub

This bash script takes in a 4-digit natural number and encodes according to the given field.

```bash
1.  #!/bin/bash
2.
3.  read -p "Please input a four digit natural number: " input
4.
5.
6.  if [[ $input =~ ^-[0-9]+$ ]]; then
7.    echo "Error: Got a negative number. Please input a four digit natural number."
8.    ./$(basename $0) && exit
9.
10. elif [[ $input =~ ^[0-9]+$ ]]; then
11.   if [[ ${#input} -ne 4 ]]; then
12.         echo "Error: Got a ${#input} digit number. Please input a four digit natural number."
13.         ./$(basename $0) && exit
14.   fi
15.
16. elif [[ $input =~ ^[+-]?[0-9]+\.?[0-9]*$ ]]; then
17.   echo "Error: Got a float. Please input a four digit natural number."
18.   ./$(basename $0) && exit
19.
20. else
21.   echo "Error: Got a string. Please input a four digit natural number."
22.   ./$(basename $0) && exit
23.
24. fi
25.
26.
27. char0=("0")
28. char1=("1")
29. char2=("A" "B" "C")
30. char3=("D" "E" "F")
31. char4=("G" "H" "I")
32. char5=("J" "K" "L")
33. char6=("M" "N" "O")
34. char7=("P" "Q" "R" "S")
35. char8=("T" "U" "V")
36. char9=("W" "X" "Y" "Z")
37.
38. typeset -n digit1=char${input:0:1}
39. typeset -n digit2=char${input:1:1}
40. typeset -n digit3=char${input:2:1}
41. typeset -n digit4=char${input:3:1}
42.
43. for c_1 in ${digit1[@]};
44. do
45.   for c_2 in ${digit2[@]};
46.   do
```

```
47.                for c_3 in ${digit3[@]};
48.                do
49.                        for c_4 in ${digit4[@]};
50.                        do
51.                                echo $c_1$c_2$c_3$c_4
52.                        done;
53.                done;
54.        done;
55. done;
56.
```

TERMINAL:

xerefic@xerefic: ~/Desktop/Courses/MM2090/Assignments/Assignment_2/question1

```
(base) xerefic@xerefic:~/Desktop/Courses/MM2090/Assignments/Assignment_2/question1$ ./commands.sh
Please input a four digit natural number: -4895
Error: Got a negative number. Please input a four digit natural number.
Please input a four digit natural number: 578.56
Error: Got a float. Please input a four digit natural number.
Please input a four digit natural number: abcd
Error: Got a string. Please input a four digit natural number.
Please input a four digit natural number: 48
Error: Got a 2 digit number. Please input a four digit natural number.
Please input a four digit natural number: 96854
Error: Got a 5 digit number. Please input a four digit natural number.
Please input a four digit natural number:
```

xerefic@xerefic: ~/Desktop/Courses/MM2090/Assignments/Assignment_2/question1

```
(base) xerefic@xerefic:~/Desktop/Courses/MM2090/Assignments/Assignment_2/question1$ ./commands.sh > 9876.txt
Please input a four digit natural number: 9876
(base) xerefic@xerefic:~/Desktop/Courses/MM2090/Assignments/Assignment_2/question1$ ./commands.sh > 3456.txt
Please input a four digit natural number: 3456
(base) xerefic@xerefic:~/Desktop/Courses/MM2090/Assignments/Assignment_2/question1$
```

OUTPUT (3456):

DGJM	EHKO
DGJN	EHLM
DGJO	EHLN
DGKM	EHLO
DGKN	EIJM
DGKO	EIJN
DGLM	EIJO
DGLN	EIKM
DGLO	EIKN
DHJM	EIKO
DHJN	EILM
DHJO	EILN
DHKM	EILO
DHKN	FGJM
DHKO	FGJN
DHLM	FGJO
DHLN	FGKM
DHLO	FGKN
DIJM	FGKO
DIJN	FGLM
DIJO	FGLN
DIKM	FGLO
DIKN	FHJM
DIKO	FHJN
DILM	FHJO
DILN	FHKM
DILO	FHKN
EGJM	FHKO
EGJN	FHLM
EGJO	FHLN
EGKM	FHLO
EGKN	FIJM
EGKO	FIJN
EGLM	FIJO
EGLN	FIKM
EGLO	FIKN
EHJM	FIKO
EHJN	FILM
EHJO	FILN
EHKM	FILO
EHKN	

OUTPUT (9876):

WTPM	XUPM	YVPM
WTPN	XUPN	YVPN
WTPO	XUPO	YVPO
WTQM	XUQM	YVQM
WTQN	XUQN	YVQN
WTQO	XUQO	YVQO
WTRM	XURM	YVRM
WTRN	XURN	YVRN
WTRO	XURO	YVRO
WTSM	XUSM	YVSM
WTSN	XUSN	YVSN
WTSO	XUSO	YVSO
WUPM	XVPM	ZTPM
WUPN	XVPN	ZTPN
WUPO	XVPO	ZTPO
WUQM	XVQM	ZTQM
WUQN	XVQN	ZTQN
WUQO	XVQO	ZTQO
WURM	XVRM	ZTRM
WURN	XVRN	ZTRN
WURO	XVRO	ZTRO
WUSM	XVSM	ZTSM
WUSN	XVSN	ZTSN
WUSO	XVSO	ZTSO
WVPM	YTPM	ZUPM
WVPN	YTPN	ZUPN
WVPO	YTPO	ZUPO
WVQM	YTQM	ZUQM
WVQN	YTQN	ZUQN
WVQO	YTQO	ZUQO
WVRM	YTRM	ZURM
WVRN	YTRN	ZURN
WVRO	YTRO	ZURO
WVSM	YTSM	ZUSM
WVSN	YTSN	ZUSN
WVSO	YTSO	ZUSO
XTPM	YUPM	ZVPM
XTPN	YUPN	ZVPN
XTPO	YUPO	ZVPO
XTQM	YUQM	ZVQM
XTQN	YUQN	ZVQN
XTQO	YUQO	ZVQO
XTRM	YURM	ZVRM
XTRN	YURN	ZVRN
XTRO	YURO	ZVRO
XTSM	YUSM	ZVSM
XTSN	YUSN	ZVSN
XTSO	YUSO	ZVSO