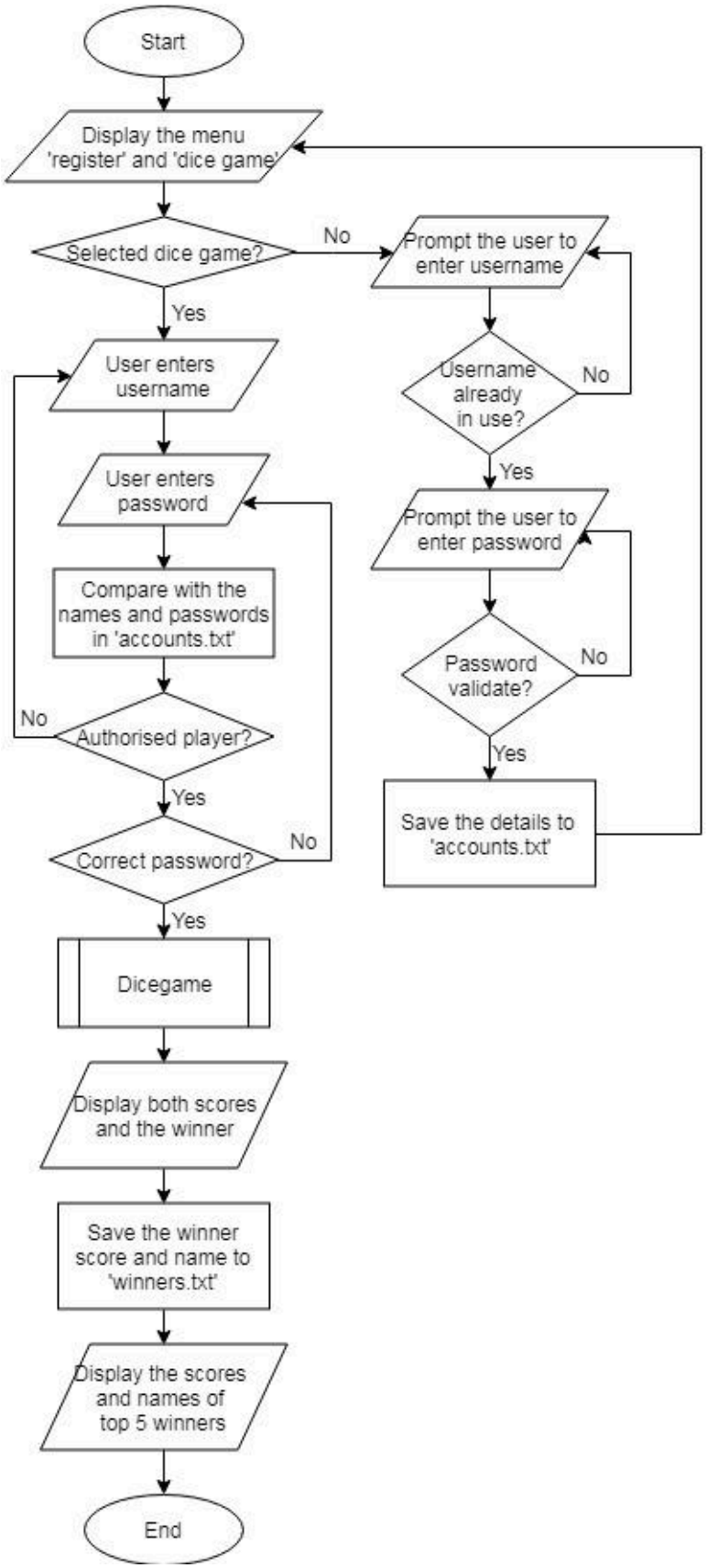
GCSE Computer Science
Not Examined Assessment
Task 2 — Two-player dicegame

Programming Project Report
Yejin Moon
Date started: 09/10/18
Date completed:

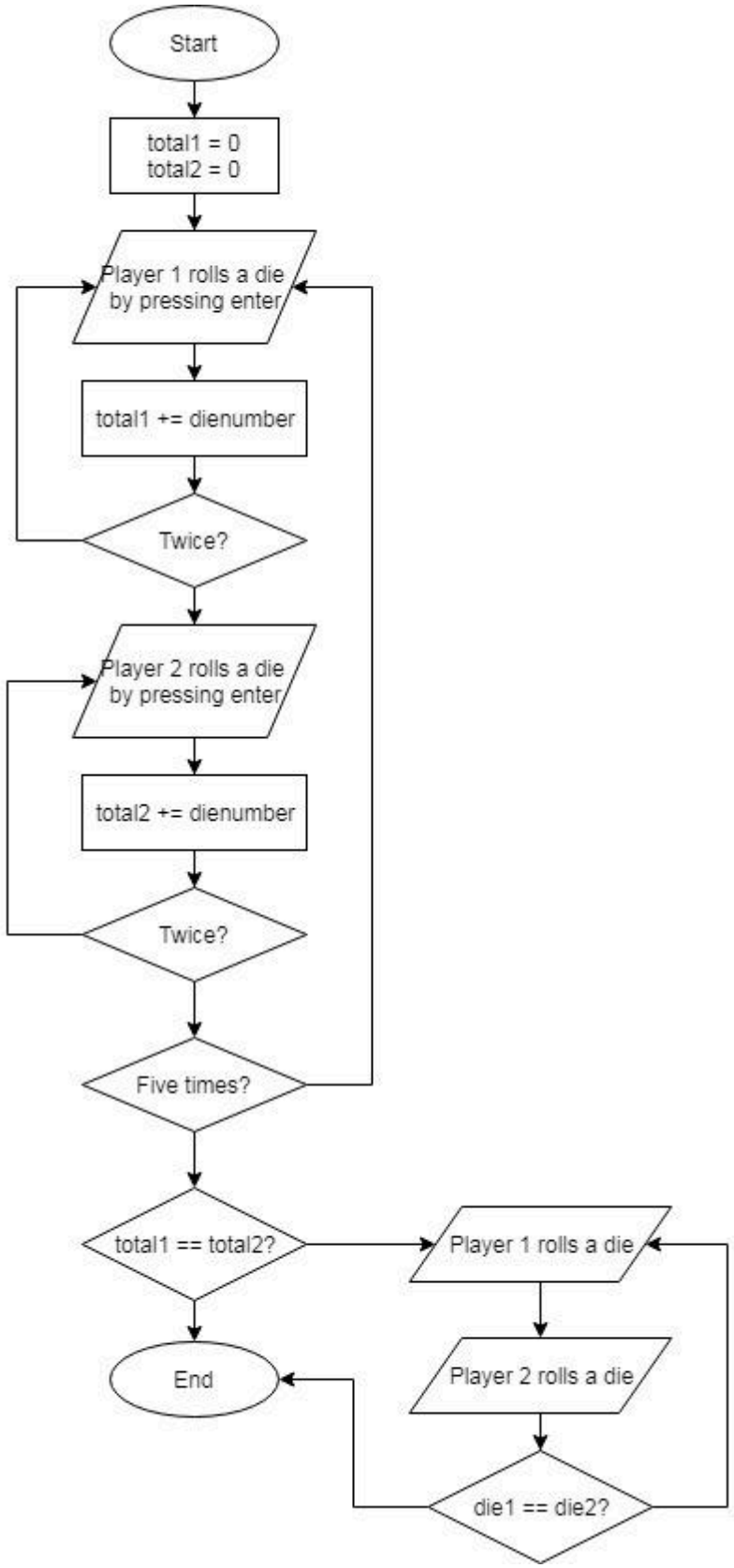
Algorithm

1) Display the menu with ‘register’ and ‘play dice game’
2) If the user selects register:
    a) Let the user enter username and password
    b) See if the username is already in use
    c) Display the menu again
3) Ask the first user to enter their username and password
4) See if they are authorised, and see if the password is correct
5) Ask the second user to enter their username and password
6) See if they are authorised, and see if the password is correct
7) Allow player 1 to roll a die and then another
8) Display their score
9) Allow player 2 to roll a die and then another
10) Display their score
11) Compare and display their total scores so far
12) Repeat from 5) to 9) 5 times
13) If their total scores are the same:
    a) allow player 1 to roll a die and then player 2, until someone rolls higher
    b) If not, compare the scores and display the winner
14) Store the score and username of the winner in a text file
15) Display the score and username of top 5 winning scores from the text file

Flowchart


Start
Display the menu 'register' and 'dice game'
Selected dice game?
No
Prompt the user to enter username
Yes
User enters username
Username already in use?
No
Yes
User enters password
Prompt the user to enter password
Compare with the names and passwords in 'accounts.txt'
Password validate?
No
No
Authorised player?
Yes
Yes
Correct password?
No
Save the details to 'accounts.txt'
Yes
Dicegame
Display both scores and the winner
Save the winner score and name to 'winners.txt'
Display the scores and names of top 5 winners
End

Flowchart - subprogram



1. Menu

Success criteria

1) The program displays a menu to the user
2) The menu includes 'Register' and 'Two-player dice game'
3) If the user enters a number the corresponding sub-program begins to run

Design (Pseudocode)

PRINT menu

IF user enters 1

    RUN Register

ELSEIF user enters 2

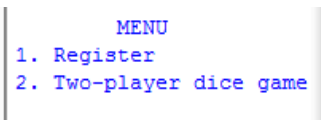
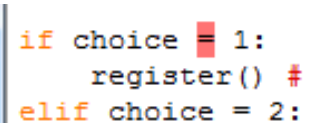
    RUN Two-player dice game

ENDIF

Design (Python code)

```
'''a program to display a menu and give a choice to the user'''

print('''      MENU
1. Register
2. Two-player dice game
''') #it displays the menu for the user

choice = int(input("Enter your choice: ")) #a dynamic variable to take user's choice

if choice = 1:     #a selection to call the subprogram the user wants
    register() #function to allow the user to sign up
elif choice = 2:
    dicegame() #function that runs a two-player dice game
```

Test

Test	What happened	Evidence	Development	Outcome
It displays the menu in three lines	It worked. It printed the content inside the quotation marks			
It runs the subprogram 'register' when the user enters 1	Syntax error		I added another equal sign 	

It runs the subprogram 'dicegame' when the user enters 2	'dicegame' began to run			
It asks for another input for 'choice' when it is not 1 or 2				

3. Register

Success criteria

1) The user enters their details
2) If the username or password is already in use, the user enters another one
3) The details are saved to an external file
4) It displays the menu at the end and takes the choice

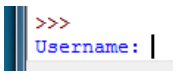
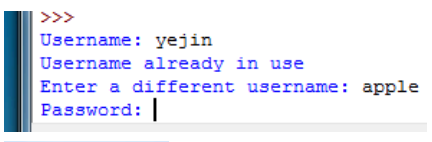
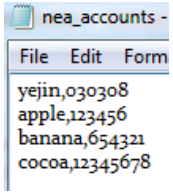
Design (Pseudocode)

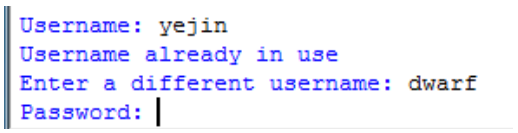
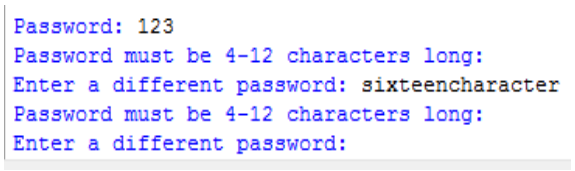
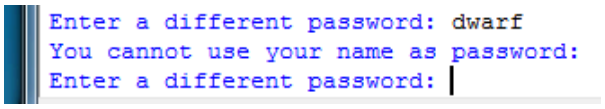
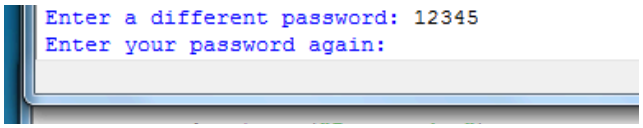
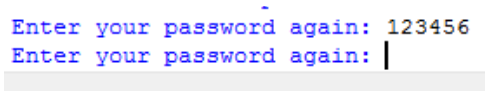
```
FUNCTION register
        OPEN file 'nea_accounts.txt' in read mode
        SPLIT the data by commas
        ASK for username
        ASK for password
        WHILE username is already in use
                ASK for a new one
        WHILE password is not 4-12 characters long
                ASK for a new one
        WHILE verification for password is unsuccessful
                ASK for a new verification
        CLOSE file
        OPEN file in append mode
        SAVE the username and password to the file
        CLOSE file
```

Design (Python)

```
def register():
    file = open('nea_accounts.txt', 'r') #opens the file in read mode
    line = file.readline()
    data = line.split(',') #splits the data into pieces with commas
    username = input("Username: ")

#linear search
    value = 0 #variable for the position number
    found = False #boolean function (False=data not found)
    while value < len(data) and found is False: #search not finished, data not found
        if data[value] == username: #when there is one
            found = True
        else:
            value += 1 #moves on to the next value
        print("Username already in use")
        username = input("Enter a different username: ")

    password = input("Password: ")
#validation
    while len(password) < 4 or len(password) > 12: #when the password is invalid (too short or long)
        print("Password must be 4-12 characters long: ")
        password = input("Enter a different password: ")
#second validation
    while password == username: #when the password is not strong
        print("You cannot use your name as password: ")
        password = input("Enter a different password: ")
#verification
    verification = 0
    while verification != password: #ensuring the password
        verification = input("Enter your password again: ")

    file.close()

    file = open('accounts.txt', 'a') #opens the file in append mode
    file.write(username+',')
    file.write(password)

    file.close()

()

register()
```

Test

Aim	What happened	Evidence
The program will ask for username	It worked	
When I put an existing username the program will ask for a new one	It only worked once (logic error)	 

When I put a non-existing username the program will ask for a password	It worked	
When I put a pw shorter than 4 or longer than 12 characters it will ask for a new one	It worked	
When I put my username as password it will ask for a new one	It worked	
When I put a valid pw it'll ask to enter again for verification	It worked	
When I put a wrong one it'll ask again	It worked	
(development) I adapted it so that it asks for the pw and then verification		

3. Authorisation

1) Two users enter their usernames and passwords
2) The program searches the external file containing the accounts
3) If the information is in the file, authorise the users
4) If not, deny access
5) Call the dicegame for the authorised users

4. Dicegame

Success criteria

1) Two users press 'enter' alternatively
2) Program generates a random dice number from 1 to 6 each time

3) Dice numbers for each player are accumulated and compared
4) Winner scores are saved to an accessible external file in ascending order
5) Top 5 scores are read from the external file

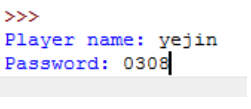
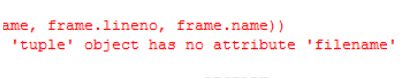
Design (Pseudocode)

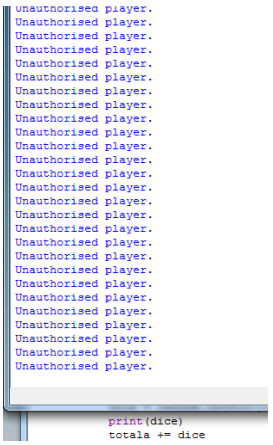
```
IMPORT random

FUNCTION dicegame
        OPEN 'nea_accounts.txt'
        SPLIT the data by commas
ASK first player for username
ASK for password
IF the user is unauthorised
        ASK if they want to try again, register or quit
ENDIF

ASK second player for username
ASK for password
IF the user is unauthorised
        ASK if they want to try again, register or quit

FOR 5 times
        GENERATE two random numbers for player 1
        ADD them to their score
        GENERATE two random numbers for player 2
        ADD them to their score
ENDFOR

IF score1 == score2
        GENERATE a random number for each player UNTIL one wins

IF score1 > score2
        OUTPUT player1 as the winner
        SAVE their username and score to 'winners.txt'
ELSEIF score2 > score1
        OUTPUT player2 as the winner
        SAVE their username and score to 'winners.txt'
```

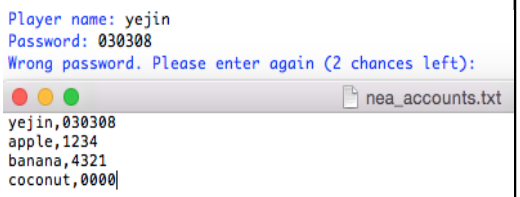
Design (Python)

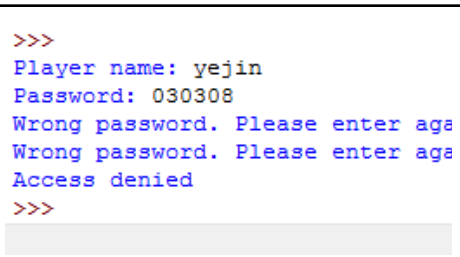
```
import random

def dicegame():
    file = open('nea_accounts.txt', 'r')
    line = file.readline()
    data = line.split(',')

    playera = input("Player name: ")
    passworda = input("Password: ")

    while data[0] != playera:
        line = file.readline()
        data = line.split(',')
        if found is False:
            print("Unauthorised player.")
        else:
            while data[1] != passworda:
                passworda = input("Wrong password. Please enter again: ")
    print("Welcome back")

    playera = input("Player name: ")
    passworda = input("Password: ")
    found = False
    while data[0] != playera:
        line = file.readline()
        data = line.split(',')
        if found is False:
            print("Unauthorised player.")
        else:
            while data[1] != passworda:
                passworda = input("Wrong password. Please enter again: ")
    print("Welcome back")

    file.close()
```

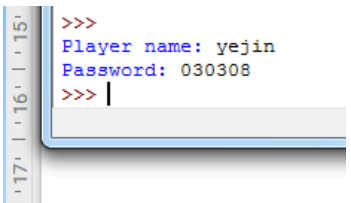
Testing

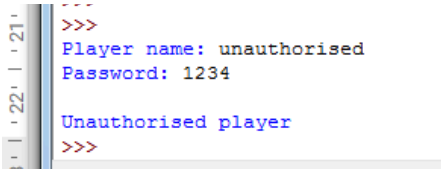
Test purpose	Expected outcome	Actual Outcome
The program will ask for player name and password Test data: 'yejin' for username and '0308' for password	Worked	 It worked
If the username is not found on the list it will print 'unauthorised player'	Syntax error	 Syntax error

(development)
I deleted boolean function and simplified the program
 	
`playera = input("Player nan`
`passworda = input("Password`
`counter = 0 #counter is use`
`access = False`
 	
`if data[0] == playera and d`
`print("Welcome back")`
`access = True`
`elif data[1:`
	Logic error	

(development)
I changed the while loop to selection so that the program is easier to read
 	
`if data[0] == playera:`
`if data[1] == passworda: #if the user is authorised and`
`print("Welcome back")`
`else:`
`for counter in range(2):`
`counter += 1`
`passworda = input("Wrong password. Please enter`
`print("Access denied")`
`else:`
`position = 0`
`found = False`
`while position < len(file.readlines()) and found is Fals`
`if data[position] == playera:`
`found = True`
`position += 1`
`print("Unauthorised player")`
	Logic error - I put in the correct password but it didn't work	

(development)
I added str() to data[0] and data[1] so they are read as strings
 	
`if playera == str(data[0]) and passworda ==`
`print("Welcome back")`
`access = True`
	Logic error- The program does not print 'welcome back'	

(development)
I split the IF statement into two
 	
`if playera == str(data[0]):`
`if passworda == str(data[1]):`
`print("Welcome back")`
`access = True`
	Logic error - The program outputs nothing	

(development) I made a big IF selection for username and a smaller one inside for password.	It worked - the program printed 'unauthorised player' and stopped the program	

<pre>if playera == str(data[0]):
    if passworda == str(data[1]):
        print("Welcome back")
        access = True
    else:
        for counter in range(2):
            counter += 1
            passworda = input("Wrong password. Pl
        print("Access denied")
else:
    while data[0] != playera and counter < len(fi
        line = file.readline()
        data = line.split(',')
        print(data[0])
        if data[0] == playera:
            if data[1] == passworda: #if the use
                print("Welcome back")
                access = True
                break
        print("Unauthorised player")</pre> And I tried an unauthorised username with a random password.		

I tried an authorised username and wrong password	It worked - it printed 'wrong password' and gave me 2 more chances	<pre>>>>
		Player name: yejin
		Password: 1234
		Wrong password. Please enter again (2 chances left):</pre>

I tried an authorised username and wrong password, and then put correct password	Logic error - the program didn't take the correct one	<pre>>>>
		Player name: yejin
		Password: 1234
		Wrong password. Please enter again (2 chances left): 030308
		Wrong password. Please enter again (1 chances left):</pre>

(development)
I changed the order of the loops and selections so that username is first checked on the text file and then compared to the input username.
<pre>while data[0] != playera and counter < len(file.readlines()):
    line = file.readline()
    data = line.split(',')
    print(data[0])
    counter += 1
    if data [0] == playera:
        if passworda == str(data[1]):
        print("Welcome back")
        access = True
        else:
            for counter in range(2):
                counter += 1
                passworda = input("Wrong password. Please enter ag
            print("Access denied")
    else:
        print("Unauthorised player. Access denied")
        break</pre>
	Syntax error - unexpected indent	<pre>if passworda == str(data[1]
		print("Welcome back")
		access = True
		else:</pre>

(development)
I indented the two lines below the IF statement
<pre>if passworda == str(data[1]):
    print("Welcome back")
    access = True
else:</pre> And I put in an authorised username and password
	Logic error - The program did not give access	<pre>Player name: apple
		Password: 1234
		
		Unauthorised player. Access denied</pre>

(development)
I deleted the line 'if data[0] == playera' because it repeats the while loop
	Logic error - The program doesn't take the correct	<pre>Player name: yejin
		Password: 030308
		Wrong password. Plea</pre>

<table>
<tr>
<td>

```
while data[0] != playera and counter < len(file.readlines()):
    line = file.readline()
    data = line.split(',')
    print(data[0])
    counter += 1

    if passworda == str(data[1]):
        print("Welcome back")
        access = True
        break
    else:
        for counter in range(2):
            counter += 1
            passworda = input("Wrong password. Please enter again ('
        print("Access denied")
        break
```

</td>
<td>password</td>
<td></td>
</tr>
<tr>
<td rowspan="2">The program will run the function 'dicegame()' and start with asking for player nickname and password for authorisation</td>
<td>Syntax error</td>
<td>

```
if totala > totalb:
    print("Congratulations!",playera
    winner = playera
elif totalb > totala:
    print("Congratulations!",playerb
    winner = playerb
```

</td>
</tr>
<tr>
<td>Index error: list index out of range</td>
<td>

```
  File "U:\programming\nea_dicegame.py", line 84, in <mo
    dicegame()
  File "U:\programming\nea_dicegame.py", line 19, in dic
    if passworda == data[1]:
IndexError: list index out of range
```

</td>
</tr>
<tr>
<td>I press the enter key 20 times and the program will accumulate the score for each player and display it at the end</td>
<td>Type error</td>
<td>

```
  File "C:\Program Files\Python 3.5\lib\idlelib\run.p
    exec(code, self.locals)
  File "U:\programming\nea_dicegame.py", line 84, in
    dicegame()
  File "U:\programming\nea_dicegame.py", line 53, in
    print(playera+'    '+playerb+'\n'+totala,':',tota
TypeError: Can't convert 'int' object to str implicit
```

</td>
</tr>
<tr>
<td>(development)
I changed the type of the integer variables 'totala' and 'totalb' into string by putting them in 'str()'


```
+str(totala),':',str(totalb))
```

</td>
<td>Name error</td>
<td>

```
  File "U:\programming\nea_dicegame.py", lin
    print(player_a,totala,' : ',totalb,playe
NameError: name 'player_a' is not defined

During handling of the above exception, anot
```

</td>
</tr>
<tr>
<td rowspan="2">(development)
I changed variable names 'player_a' and 'player_b' into 'playera' and 'plalyerb' respectively so that the names are consistent throughout


```
totalb += diceb
print(playera,totala,' : ',totalb,playerb)
```

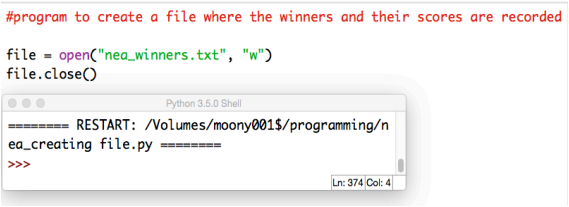
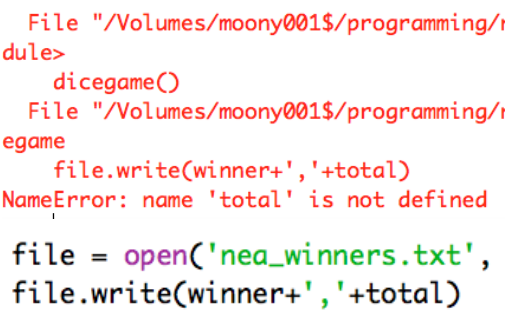
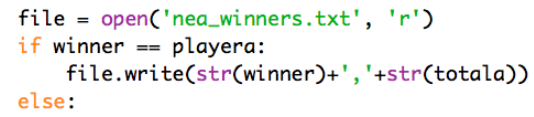
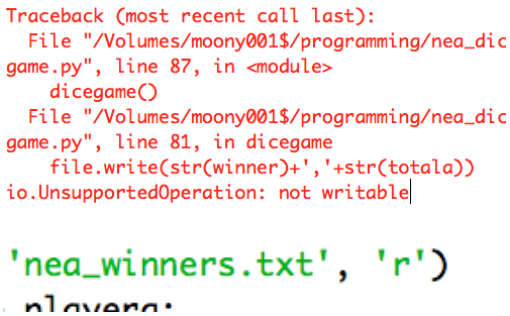
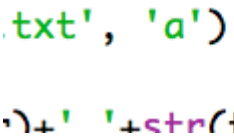
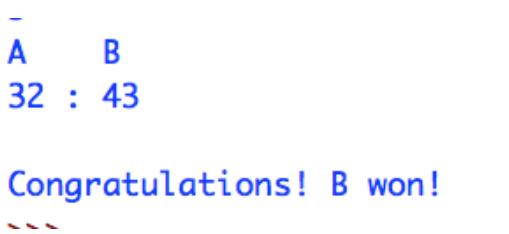
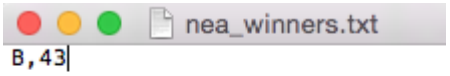
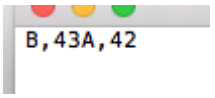
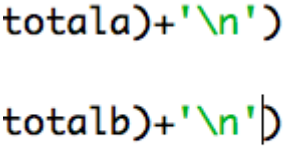
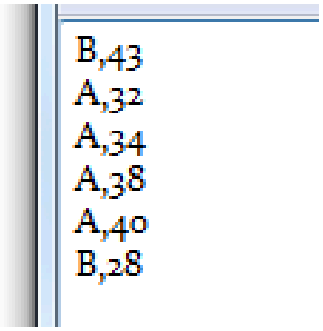
</td>
<td>'File not found' error</td>
<td>

```
    file = open('nea_winners.txt', 'r')
FileNotFoundError: [Errno 2] No such file or di

During handling of the above exception, another
```

</td>
</tr>
<tr>
<td>Outcome is displayed in an unexpected way</td>
<td>

```
A    B
36
 :
35

Congratulations! A

won!
```

</td>
</tr>
</table>

<table>
<tr>
<td>(development)
I created another Python program to make an external file where the winner names and scores are stored.
 
</td>
<td>Name error</td>
<td> 
</td>
</tr>
<tr>
<td>(development)
I added a selection algorithm so that the program takes 'playera' as the winner and stores the score only when it has won
 
</td>
<td>Unsupported operation error</td>
<td> 
</td>
</tr>
<tr>
<td rowspan="2">(development)
I changed the command word 'r' to 'a' because the operation I want is append not write
 
</td>
<td>It worked on the shell</td>
<td> 
</td>
</tr>
<tr>
<td>The program stored the player name and their score on the correct file</td>
<td> 
</td>
</tr>
<tr>
<td>I ran the program once more to ensure it works</td>
<td>Logic error - the information was stored but in the wrong way</td>
<td> 
</td>
</tr>
<tr>
<td>(development)
I added '\n' signs so that the lines are stored separately
 
</td>
<td>The program stored the winner and their score every time but not in order</td>
<td> 
</td>
</tr>
</table>

<table>
<tr><td>I ran the program several times</td><td></td><td></td></tr>
<tr><td>(development)
I added an insertion sort algorithm so that the scores are stored in ascending order in the external file
<pre>
file = open('nea_winners.txt', 'a')
line = file.readline()
score = line.split(",")
if winner == playera:
    while playera < score:
        file.readline()
    file.write(str(winner)+','+str(totala)+'\n')
else:
    file.write(str(winner)+','+str(totalb)+'\n')
    while playera < score:
        file.readline()
    file.write(str(winner)+','+str(totala)+'\n')
</pre></td><td>Unsupported operation : not readable because the command word is 'a' which is append</td><td><pre>
Traceback (most recent call last):
Traceback (most recent call last):
Traceback (most recent call last):
  File "C:\Program Files\Python 3.5\lib\id
    exec(code, self.locals)
  File "U:\programming\nea_dicegame.py", l
    dicegame()
  File "U:\programming\nea_dicegame.py", l
    line = file.readline()
io.UnsupportedOperation: not readable
</pre></td></tr>
<tr><td>(development)
I changed the command word to 'r' which is read,
<pre>
file = open('nea_winners.txt', 'r')
line = file.readline()
</pre>and added separate lines where append mode is required. I also added 'file.close()' where file reading is finished
<pre>
ine = file.readline()
core = line.split(",")
f winner == playera:
    while playera < score:
        file.readline()
    file.close()
    file = open('nea_winners.txt', 'a')
    file.write(str(winner)+','+str(totala)+'\n')
lse:
    file.write(str(winner)+','+str(totalb)+'\n')
    while playera < score:
        file.readline()
    file.close()
    file = open('nea_winners.txt', 'a')
    file.write(str(winner)+','+str(totala)+'\n')
</pre></td><td>Type error because I did not put position numbers after 'score'</td><td><pre>
    while playera < score:
TypeError: unorderable types: str() < list()

During handling of the above exception, anothe
</pre></td></tr>
<tr><td>(development)
I added position number [1] for every 'score' and ran the program several times
<pre>
while playera < score[1]:
    file.readline()
</pre></td><td>Error (not writable)</td><td></td></tr>
<tr><td>(development)
I changed the wrong variable names and put int() to the 'score[1]'
<pre>
        winner = playerb

file = open('nea_winners.txt', 'r')
line = file.readline()
score = line.split(",")
if winner == playera:
    while totala < score[1]:
        file.readline()
    file.close()
    file = open('nea_winners.txt', 'a')
    file.write(str(winner)+','+str(totala)+'\n')
else:
    while totalb < score[1]:
        file.readline()
    file.close()
    file = open('nea_winners.txt', 'a')
    file.write(str(winner)+','+str(totalb)+'\n')
</pre></td><td>Logic error - winner scores are saved but not in ascending order</td><td><pre>
File Edit Form
A,23
A,35
A,41
A,39
B,41
</pre></td></tr>
</table>

(development)
I decided to sort the winner scores at the printing stage, so I deleted all the iteration structure
`file = open('nea_winners.txt', 'a')`
`if winner == playera:`
`  file.write(str(winner)+','+str(totala)+'\n')`
`else:`
`  file.write(str(winner)+','+str(totalb)+'\n')`
	It worked - all the outcomes were saved	File Edit Format View Help
		A,23
		A,35
		A,41
		A,39
		B,41
		A,39
		A,37
		A,41
		A,31
		B,29
		A,32
		A,38

(development)
I added a for loop iteration structure so the program will sort the winners' scores in ascending order (or descending order)
`file = open('nea_winners.txt', 'r') #open in rea`
`line = file.readline()`
`data = line.split(',')`
`scores = data[1]`
`winnerList = []`
`for file in range(len(file)):`
`  winnerList.append(scores)`
`  file.readline()`
	Attribute error	`file.readline()`
		`AttributeError: 'int' object has no attribute 'readline'`

`file = open('nea_winners.txt', 'r') #opline.en in read`
`line = file.readline()`
`data = line.split(',')`
`scores = data[1]`
`winnerList = []`
`count = 0`
`while scores != '':`
`  count += 1`
`for file in range(count):`
`  winnerList.append(scores)`
`  file.readline()`
	Error - there is an error because creating a new list needs 'list()' syntax	

(development)
I made a while loop to count the number of items in the 'winners' list. The program will keep on counting until there is no item left, which is taken as an empty space.
The for loop is to create a list that contains the winners' names and scores. The list is later to be sorted in order. For the number of the items, the items are added to the list.
`winnerList = list()`
`count = 0`
`while scores != ' ':`
`  count += 1`
`  file.readline()`
`for file in range(count):`
`  winnerList.append(scores)`
`  file.readline()`
`print(scores)`
`print(winnerList)`
	Logic error - the program still ran but it did not print out the list created. I think it is because the entire file has already been read beforehand so there is nothing to be read.	A B
		28 : 38
		Congratulations! B won!

(development)
The first part of the 'displaying top 5 scores', which is the while loop, was tested to check if the program really counts the number of items properly. I put 'print(count)' to test this.
`file = open('nea_winners.txt', 'r') #open in read mode`
`line = file.readline()`
`data = line.split(',')`
`scores = data[1]`
 	
`count = 0`
`while scores != ' ':`
`  count += 1`
`  file.readline()`
`file.close()`
`print(count)`
	Logic error - the program ran but it did not print the counter number	A B
		35 : 41
		Congratulations! B won!

(development)		

Pseudocode

Import random // dice number must be randomly generated

FUNCTION register // taking in new user information

OPEN file 'dicegame_accounts.txt' in append mode

Split the data by commas

Prompt for username

Prompt for password

Save the username and password to the file

CLOSE file

FUNCTION dicegame //subprogram or procedure that carries out two-player dice game

total1 = 0

total2 = 0

FOR 5 times

PRINT 'Player 1's turn'

FOR 2 times

Ask the user to press enter

die = random integer between 1 and 6

total1 += die

ENDFOR

PRINT 'Player 2's turn'

FOR 2 times

```
                Ask the user to press enter
                die = random integer between 1 and 6
                total2 += die
        ENDFOR
        PRINT total 1 and total 2
        PRINT the username of winner
ENDFOR
PRINT top 5 winners from ‘winners.txt’
```

Test design

Test	What am I testing?	What data will I use?	Normal/Boundary/Erroneous	Expected Result
1				
2				
3				
4				
5				

```
import random

def dicegame():
    file = open('nea_accounts.txt', 'r')
    line = file.readline()
    data = line.split(',')

    playera = input("Player name: ")
    passworda = input("Password: ")
    found = False
    while data[0] != playera:
        line = file.readline()
        data = line.split(',')
        if found is False:
            choice = int(input("""Unauthorised player.
1. Try agian
2. Register
3. Quit
"""))

        else:
            while data[1] != passworda:
                passworda = input("Wrong password. Please enter again: ")
    print("Welcome back")

    playera = input("Player name: ")
    passworda = input("Password: ")
    found = False
    while data[0] != playera:
        line = file.readline()
        data = line.split(',')
        if found is False:
            choice = int(input("""Unauthorised player.
1. Try agian
2. Register
3. Quit
"""))
```

```
    else:
        while data[1] != passworda:
            passworda = input("Wrong password. Please enter again: ")
print("Welcome back")

file.close()

totala = 0
totalb = 0
for game in range(5):
    for roll in range(2):
        dice = input("Player 1's turn")
        dice = random.randint(1,6)
        totala += dice
        dice = input("Player 2's turn")
        dice = random.randint(1,6)
        totalb += dice
print(totala,':',totalb)

if totala > totalb:
    print("Congratulations!",playera,"won!")
    winner = playera
elif totalb > totala:
    print("Congratulations!",playerb,"won!")
    winner = playerb
else:
    dicea = 0
    diceb = 0
    while dicea == diceb:
        dicea = input("Player 1 rolls a die")
        dicea = random.randint(1,6)
        totala += dicea
        diceb = input("Player 2 rolls a die")
        diceb = random.randint(1,6)
        totalb += diceb
        print(player_a,totala,' : ',totalb,player_b)
    if totala > totalb:
        print("Congratulations!",playera,"won!")
```

```
            globalwinner = playera
        elif totalb > totala:
            print("Congratulations!",playerb,"won!")
            winner = playerb

    file = open('nea_winners.txt', 'r')
    file.write(winner+','+total)

()

dicegame()
```