Simple Programming

Lesson 5: While Loops
(Part 2)

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Lesson Overview

Objectives

Understand the use of variables in loop.

Understand how the while loop works with different conditions.

Understand how to use to Try and Except to catch errors.

Outcomes

Task 1: Guess my Number
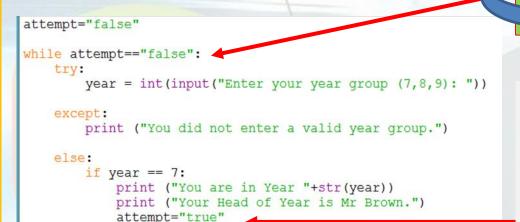
Part 1: ATM Task (Pin)

Part 2: ATM Task (Option Menu)

Part 3: ATM Task (Withdraw Cash)

Part 4: ATM Task (Extension)

Programming

Loops Overview

While Loop

The While Loop is based on conditions. If the condition is True then the while Loop will continue to loop.

If attempt == False

Loop will continue

```
attempt="false"

while attempt=="false":
    try:
        year = int(input("Enter your year group (7,8,9): "))

    except:
        print ("You did not enter a valid year group.")

    else:
        if year == 7:
            print ("You are in Year "+str(year))
            print ("Your Head of Year is Mr Brown.")
            attempt="true"
```

If attempt is not equal to False then the loop will stop

If the correct year is selected then attempt variable will change to True.

Task 1: Guess my Number

1. Create a **script which will allow the user to guess the correct number.**
2. Users will get a **maximum of three attempts** and be given hints (**higher or lower**).

```python
mynumber = 5
numberguesses = 0
maxguesses = 3
breakloop="false"
guess=0

print ("I'm thinking of a number between 1 and 10. Can you guess it in 3 or fewer tries?")

while numberguesses < maxguesses and breakloop=="false":
    try:
        guess = int(input("Guess a number between 1 and 10: "))

        numberguesses= numberguesses + 1

        if guess < mynumber:
            print ("Your guess is too low.")

        elif guess > mynumber:
            print ("Your guess is too high.")

        else:
            print ("Good job! You guessed my number in " +str(numberguesses)+ " tries.")
            breakloop="true"

    except:
        print ("You can only enter a number")

if breakloop=="false":
    print ("I'm afraid you have taken too many guesses! The number I was thinking of was "+str(mynumber)+ ".")
```

Loop is broken when breakloop is true

Part 1: ATM Task (Pin)

1. **You will be creating a script which will mimic the behaviour of an ATM machine.**
2. **Users will be prompted to enter a four digit PIN to log on.**
3. **Users will have three attempts to enter the right PIN or be locked out of the system.**

```
correctpin="false"
pin=5678
pinattempt=0
attempt=0

while correctpin=="false" and attempt<3:
    try:
        pinattempt=int(input("Enter the four digit pin: "))

    except:
        print ("You can only type numbers.")

    if pinattempt !=pin:
        print ("You have entered the incorrect pin.")
        attempt=attempt+1
        print ("This is your "+str(attempt)+" attempt.")

    else:
        print ("you have entered the correct pin.")
        correctpin="true"
```

Declare the following variables

Loop is broken when correctpin is **true**

Programming

```python
if correctpin=="true":
    print("Please select your option")
    print("1. Check Balance.")
    print("2. Withdraw Cash.")
    print("3. Deposit Cash.")
    print("4. Exit.")

    while menuoption=="false":
        try:
            option = int(input("Enter your option: "))

        except:
            print ("You did not enter a valid option.")

        if option == 1:
            print ("You have chosen option "+str(option))
            print ("Check Balance.")
            menuoption="true"

        elif option == 2:
            print ("You have chosen option "+str(option))
            print ("Withdraw Cash")
            menuoption="true"

        elif option == 3:
            print ("You have chosen option "+str(option))
            print ("Deposit Cash")
            menuoption="true"

        elif option == 4:
            print ("You have chosen option "+str(option))
            print ("You have chosen to exit")
            menuoption="true"
            exit()

        else:
            print ("You did not enter a valid option")

else:
    print("You have been blocked")
    exit()
```

```python
menuoption="false"
option=0
```

Declare the following variables

1. If the **correctpin** is equal to **true** then create a menu.

2. The menu should have at least four options including:
    1. Check Balance
    2. Withdraw Cash
    3. Deposit Cash
    4. Exit

3. Menu should loop until the correct option has been entered.

4. If the **correctpin** is **not equal** to **true** then print "**you have been blocked**" and exit the program.

Part 3: ATM Task (Withdraw Cash)

```
balance=1000
woption="false"
w=0
```

1. **Declare the variables on the left:**

    1. **Balance (You can set as any value)**

    2. **woption = false --- to break the loop**

    3. **W – withdraw amount**

```python
elif option == 2:
    print ("You have chosen option "+str(option))
    print ("Withdraw Cash")
    menuoption="true"
    while woption=="false":
        try:
            w=int(input("Enter the amount you wish to withdraw: "))

            if w<balance:
                print ("You have selected £"+str(w)+" amount to withdraw")
                balance = balance - w
                print ("Your new balance is £"+str(balance))
                woption="true"
                exit()

            else:
                print ("You have insufficent funds. Please select a lesser amount:")
                woption="false"

        except:
            print("You can only enter numbers")
```

2. Create a loop which will withdraw money if the balance is sufficient.

3. Include an else statement to include an insufficient funds message.

Part 4: ATM Task (Extension)

1. Complete the script including allowing the user to deposit cash to increase the balance.

2. The maximum deposit value should be set to £500

3. Create an option for the user to take a loan out.

4. The maximum amount is the current balance plus 20%.

5. Create an option for the user to change their PIN.

Plenary – Refer to the Lesson Objectives

Objectives

Understand the use of variables in loop.

Understand how the while loop works with different conditions.

Understand how to use to Try and Except to catch errors.

Plenary Task (Q&A)

Peer assess each other scripts.
Discuss the levels pupils have achieved for this task.
Question: What is the purpose of If and Nested Statements?