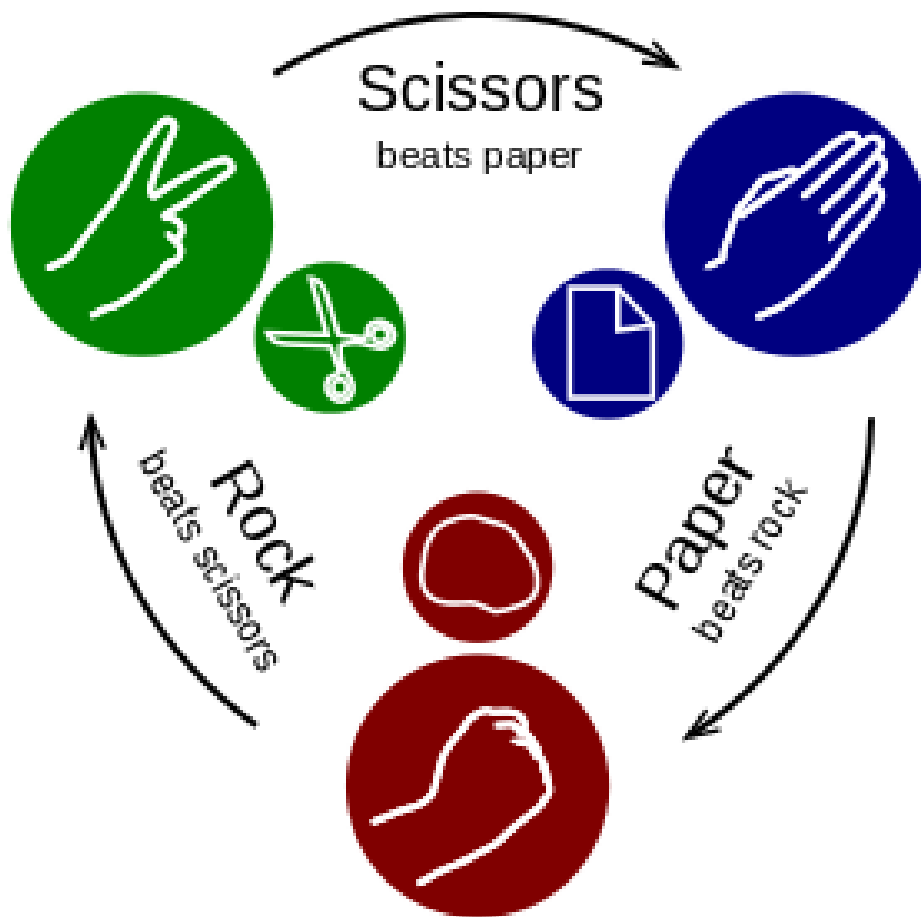


Rock, Paper Scissors

- Do you know how to play rock, paper scissors?



Who am I?

- Tim Hood
- Software Engineer, Computer Programmer, Coder, Developer
- BAE Systems in Yeovil, ~350 people
- Coding aircraft, ship, communications, website and mobile phone software for 30 years

You versus the computer

- I'll give you the code at the end
- We'll do it now bit by bit with hints
- So how will the code work - 3 bits of code
 - Computer needs to make choice
 - You need to make a choice
 - Then we need to compare them to see who has won

Computer's choice

- We'll give the computer a list of choices
- A list in Python is like this for our choices

```
choices = [ 'rock' , 'paper' , 'scissors' ]
```

- So choices is the list, a variable with a list of values, not just one value
- How do we pick one of the values?
- What does this do?

```
print ( choices [ 1 ] )
```

Computer's choice code

```
choices = ['rock', 'paper', 'scissors']  
print(choices[1])
```

Computer's choice

- It prints 'paper' !! Why not 'rock'?
- Because computers count from zero
- choices[0] is 'rock'
- So what does this do?

```
print(choices[3])
```

- Get "IndexError: list index out of range"
- Valid range of indexes is 0, 1, 2

Computer's choice code

```
choices = ['rock', 'paper', 'scissors']  
  
print(choices[1])  
  
print(choices[3])
```

Computer's choice

- How do we get computer to choose?
- Use random numbers
- Need a random 'integer' (whole) number in range 0 to 2
- Use the randint(a, b) function from the random module
- Lots of useful documentation online

<https://docs.python.org/2/library/random.html>

Computer's choice

```
import random
```

```
...
```

```
...
```

```
index = random.randint(0, 2)
```

```
computers_choice = choices[index]
```

- Use nice variable name which means something
- So that's finished now your choice

Computer's choice Code

```
import random
```

```
choices = ['rock', 'paper', 'scissors']
```

```
index = random.randint(0, 2)
```

```
computers_choice = choices[index]
```

Your choice

- How do we get your choice?
- You type it, computer reads it, stores it

```
your_choice = input('enter your choice ' )  
print(your_choice)
```

- Okay so far but it must be a valid choice
- Must reject 'Tim' or 'Tuesday' etc
- We can use the list of choices we created

Your choice Code

```
import random

choices = ['rock', 'paper', 'scissors']

index = random.randint(0, 2)

computers_choice = choices[index]

your_choice = input('enter your choice ')

print(your_choice)
```

Your choice

- Check that `your_choice` is in the list

```
if your_choice in choices:
    print(your_choice + ' is good')
else:
    print(your_choice + ' is not valid')
```

- Okay but we'd like to force you to enter values until get a valid one
- Use a loop, loop until `your_choice` is good

Your choice Code

```
...  
computers_choice = choices[index]  
  
your_choice = input('enter your choice ' )  
print(your_choice)  
  
if your_choice in choices:  
    print(your_choice + ' is good' )  
else:  
    print(your_choice + ' is not valid' )
```

Your choice

- Loop forever and then 'break' out of loop when your_choice is good

```
while True:
    your_choice = input(...
    if your_choice in choices:
        break
    else:
        print(...
```

- Break quits out of the loop

Your choice Code

```
...  
computers_choice = choices[index]  
  
your_choice = input('enter your choice ' )  
print(your_choice)  
  
while True:  
    if your_choice in choices:  
        print(your_choice + ' is good' )  
        break  
    else:  
        print(your_choice + ' is bad' )
```


Deciding who has won

- Possible outcomes are
 - A draw
 - You win
 - You lose
- If the two choices are the same it's a draw
- Easy to code

```
if your_choice == computers_choice:  
    print( 'It's a draw' )
```

Deciding who has won Code

...

```
while True:
    if your_choice in choices:
        print(your_choice + ' is good')
        break
    else:
        print(your_choice + ' is bad')

if your_choice == computers_choice:
    print('It's a draw')
```

Deciding who has won

- There are 3 ways to win
- I'll give you the first, code continues...

```
elif your_choice == 'rock' and
    computers_choice == 'scissors':
    print('You win')
elif your_choice ...
    print(...)
elif your_choice ...
```

Deciding who has won Code

```
...
    else:
        print(your_choice + ' is bad')

if your_choice == computers_choice:
    print('It's a draw')
elif your_choice == 'rock' and
        computers_choice == 'scissors':
    print('You win')
elif your_choice == 'paper' and
        computers_choice == 'rock':
    print('You win')
```

Deciding who has won

- Else you lose, code continues...

```
else:
```

```
    print( 'You lose' )
```

- That's it ...
- Complete code is on handout
- Text based very simple

Deciding who has won Code

```
...  
if your_choice == computers_choice:  
    print('It's a draw')  
elif your_choice == 'rock' and  
     computers_choice == 'scissors':  
    print('You win')  
elif your_choice == 'paper' and  
     computers_choice == 'rock':  
    print('You win')  
elif your_choice == 'scissors' and  
     computers_choice == 'paper':  
    print('You win')  
else:  
    print('You lose')
```