Comparision Operators

```
- == equal to
- != not equal to
- > gretare then
- < less then
- >= greater then equals to
- <= less then equal to
```

In [3]:
```
age = 18
```

In [4]:
```
age == 18
```

Out[4]: True

In [5]:
```
age != 19
```

Out[5]: True

In [6]:
```
age > 18
```

Out[6]: False

In [7]:
```
age < 18
```

Out[7]: False

if-else statement

syntax:

```
if condition:
    statement
else:
    statement
```

In [8]:
```
age = 20
if age >= 18:
    print("Eligible to vote")
else:
    print("not Eligible to vote")
```

```
Eligible to vote
```

Import the students_data_updated file:

In [9]:
```
import csv
```

In [10]:
```
dataset = list(csv.reader(open('students_data_updated.csv')))
```

In [11]:
```
dataset
```

Out[11]:
```
[['Roll No.',
  'Name',
  'Chemistry',
  'Physics',
  'Maths',
  'Obtain Marks',
  'Percentage'],
 ['101', 'Aliza', '45', '99', '88', '232', '77.33'],
 ['102', 'Soban', '50', '97', '87', '234', '78.0'],
 ['103', 'Noman', '43', '94', '89', '226', '75.33'],
 ['104', 'Bilal', '42', '87', '85', '214', '71.33'],
 ['105', 'Saim', '39', '76', '76', '191', '63.67'],
 ['106', 'Shameer', '38', '58', '75', '171', '57.0'],
 ['107', 'Zainab', '47', '92', '78', '217', '72.33'],
 ['108', 'Umer', '46', '86', '73', '205', '68.33'],
 ['109', 'Umair', '35', '83', '89', '207', '69.0'],
 ['110', 'Fizzah', '36', '81', '97', '214', '71.33'],
 ['111', 'Zahra', '49', '90', '94', '233', '77.67'],
 ['112', 'Fatima', '45', '88', '99', '232', '77.33'],
 ['113', 'Tooba', '43', '80', '93', '216', '72.0'],
 ['114', 'Saad', '42', '90', '77', '209', '69.67'],
 ['115', 'Azher', '41', '93', '98', '232', '77.33'],
 ['116', 'Danial', '34', '82', '87', '203', '67.67'],
 ['117', 'kaiser', '45', '91', '86', '222', '74.0'],
 ['118', 'Jibran', '46', '77', '78', '201', '67.0'],
 ['119', 'Maria', '43', '69', '94', '206', '68.67'],
 ['120', 'Amna', '38', '89', '91', '218', '72.67'],
 ['121', 'Noreen', '37', '98', '90', '225', '75.0']]
```

In [12]:
```
header = dataset[0]
data = dataset[1:]
```

Skill Test

- append satisfy if per > 70
- append unsatisfactory if per < 70

In [13]:
```
dataset[0].append("Remarks")
```

In [14]:
```
dataset[0]
```

Out[14]:
```
['Roll No.',
 'Name',
 'Chemistry',
 'Physics',
 'Maths',
 'Obtain Marks',
 'Percentage',
 'Remarks']
```

In [15]:
```
for i in data:
    if float(i[-1]) > 70:
        i.append('satisfactory')
    else:
        i.append('unsatisfactory')
```

In [16]:
```
data
```

Out[16]:
```
[['101', 'Aliza', '45', '99', '88', '232', '77.33', 'satisfactory'],
 ['102', 'Soban', '50', '97', '87', '234', '78.0', 'satisfactory'],
 ['103', 'Noman', '43', '94', '89', '226', '75.33', 'satisfactory'],
 ['104', 'Bilal', '42', '87', '85', '214', '71.33', 'satisfactory'],
 ['105', 'Saim', '39', '76', '76', '191', '63.67', 'unsatisfactory'],
 ['106', 'Shameer', '38', '58', '75', '171', '57.0', 'unsatisfactory'],
 ['107', 'Zainab', '47', '92', '78', '217', '72.33', 'satisfactory'],
 ['108', 'Umer', '46', '86', '73', '205', '68.33', 'unsatisfactory'],
 ['109', 'Umair', '35', '83', '89', '207', '69.0', 'unsatisfactory'],
 ['110', 'Fizzah', '36', '81', '97', '214', '71.33', 'satisfactory'],
 ['111', 'Zahra', '49', '90', '94', '233', '77.67', 'satisfactory'],
 ['112', 'Fatima', '45', '88', '99', '232', '77.33', 'satisfactory'],
 ['113', 'Tooba', '43', '80', '93', '216', '72.0', 'satisfactory'],
 ['114', 'Saad', '42', '90', '77', '209', '69.67', 'unsatisfactory'],
 ['115', 'Azher', '41', '93', '98', '232', '77.33', 'satisfactory'],
 ['116', 'Danial', '34', '82', '87', '203', '67.67', 'unsatisfactory'],
 ['117', 'kaiser', '45', '91', '86', '222', '74.0', 'satisfactory'],
 ['118', 'Jibran', '46', '77', '78', '201', '67.0', 'unsatisfactory'],
 ['119', 'Maria', '43', '69', '94', '206', '68.67', 'unsatisfactory'],
 ['120', 'Amna', '38', '89', '91', '218', '72.67', 'satisfactory'],
 ['121', 'Noreen', '37', '98', '90', '225', '75.0', 'satisfactory']]
```

if_elif statement

```
syntax:
    if condition:
        statement
    elif condition:
        statement
    elif condition:
        statement
    else: #(optional)
        statement
```

In [68]:
```
age = int(input('enter any number: '))
if 0 < age < 13:
    print('child')
elif 13 <= age < 18:
    print('teenager')
elif 18 <= age < 50:
    print('adult')
else:
    print('senior citizen')
```

```
enter any number: 2
child
```

Skill Test

Grades

- per >= 90 -> A+
- per >= 80 -> A
- per >= 70 -> B
- per >= 60 -> C
- per >= 50 -> D
- per < 50 -> F

In [17]:
```
header.insert(7, 'Grades')
```

In [18]:
```
header
```

Out[18]:
```
['Roll No.',
 'Name',
 'Chemistry',
 'Physics',
 'Maths',
 'Obtain Marks',
 'Percentage',
 'Grades',
 'Remarks']
```

In [19]:
```
for i in data:
    per = float(i[6])
    if 90 <= per <= 100:
        i.insert(7, 'A+')
    elif 80 <= per < 90:
        i.insert(7, 'A')
    elif 70 <= per < 80:
        i.insert(7, 'B')
    elif 60 <= per < 70:
        i.insert(7, 'C')
    elif 50 <= per < 60:
        i.insert(7, 'D')
    else:
        i.insert(7, 'Fail')
```

In [20]:
```
1 data
```

Out[20]:
```
[['101', 'Aliza', '45', '99', '88', '232', '77.33', 'B', 'satisfactory'],
 ['102', 'Soban', '50', '97', '87', '234', '78.0', 'B', 'satisfactory'],
 ['103', 'Noman', '43', '94', '89', '226', '75.33', 'B', 'satisfactory'],
 ['104', 'Bilal', '42', '87', '85', '214', '71.33', 'B', 'satisfactory'],
 ['105', 'Saim', '39', '76', '76', '191', '63.67', 'C', 'unsatisfactory'],
 ['106', 'Shameer', '38', '58', '75', '171', '57.0', 'D', 'unsatisfactor
y'],
 ['107', 'Zainab', '47', '92', '78', '217', '72.33', 'B', 'satisfactory'],
 ['108', 'Umer', '46', '86', '73', '205', '68.33', 'C', 'unsatisfactory'],
 ['109', 'Umair', '35', '83', '89', '207', '69.0', 'C', 'unsatisfactory'],
 ['110', 'Fizzah', '36', '81', '97', '214', '71.33', 'B', 'satisfactory'],
 ['111', 'Zahra', '49', '90', '94', '233', '77.67', 'B', 'satisfactory'],
 ['112', 'Fatima', '45', '88', '99', '232', '77.33', 'B', 'satisfactory'],
 ['113', 'Tooba', '43', '80', '93', '216', '72.0', 'B', 'satisfactory'],
 ['114', 'Saad', '42', '90', '77', '209', '69.67', 'C', 'unsatisfactory'],
 ['115', 'Azher', '41', '93', '98', '232', '77.33', 'B', 'satisfactory'],
 ['116', 'Danial', '34', '82', '87', '203', '67.67', 'C', 'unsatisfactor
y'],
 ['117', 'kaiser', '45', '91', '86', '222', '74.0', 'B', 'satisfactory'],
 ['118', 'Jibran', '46', '77', '78', '201', '67.0', 'C', 'unsatisfactor
y'],
 ['119', 'Maria', '43', '69', '94', '206', '68.67', 'C', 'unsatisfactor
y'],
 ['120', 'Amna', '38', '89', '91', '218', '72.67', 'B', 'satisfactory'],
 ['121', 'Noreen', '37', '98', '90', '225', '75.0', 'B', 'satisfactory']]
```

Logical Operators

- or (if single True so True)
- and (if all True so True)
- not

In [24]:
```
1 for i in data:
2     if not i[-1] == 'satisfactory':
3         print(i[1])
```

```
Saim
Shameer
Umer
Umair
Saad
Danial
Jibran
Maria
```

In [22]:
```
for i in data:
    if i[-1] == 'satisfactory' or i[-2] == 'D':
        print(i[1])
```

```
Aliza
Soban
Noman
Bilal
Shameer
Zainab
Fizzah
Zahra
Fatima
Tooba
Azher
kaiser
Amna
Noreen
```

In [26]:
```
for i in data:
    if i[-1] == 'unsatisfactory' and i[-2] == 'D':
        print(i[1])
```

```
Shameer
```

Dictionary

In [27]:
```
emp_name = 'asad'
emp_age = 20
emp_salary = 30000.0
```

In [28]:
```
emp = [emp_name, emp_age, emp_salary]
```

In [29]:
```
emp
```

Out[29]:
```
['asad', 20, 30000.0]
```

In [30]:
```
type(emp)
```

Out[30]:
```
list
```

In [36]:
```
#key:value
emp_dict = {'emp_name':'asad', 'emp_age':22, 'emp_salary':30000.0}
```

In [37]:
```
emp_dict
```

Out[37]:
```
{'emp_name': 'asad', 'emp_age': 22, 'emp_salary': 30000.0}
```

In [38]:
```
type(emp_dict)
```

Out[38]:
```
dict
```

In [39]:
```
1 emp_dict['emp_salary']
```

Out[39]:
```
30000.0
```

In [42]:
```
1 emp_dict.keys()
```

Out[42]:
```
dict_keys(['emp_name', 'emp_age', 'emp_salary'])
```

In [44]:
```
1 emp_dict.values()
```

Out[44]:
```
dict_values(['asad', 22, 30000.0])
```

Membership Operator - in

In [45]:
```
1 'emp_salary' in emp_dict
```

Out[45]:
```
True
```

In [46]:
```
1 'emp_address' in emp_dict
```

Out[46]:
```
False
```

In [47]:
```
1 emp_dict['emp_address'] = 'Gulshan'
```

In [48]:
```
1 emp_dict
```

Out[48]:
```
{'emp_name': 'asad',
 'emp_age': 22,
 'emp_salary': 30000.0,
 'emp_address': 'Gulshan'}
```

In [49]:
```
1 emp_dict['emp_name'] = 'Ali'
```

In [50]:
```
1 emp_dict
```

Out[50]:
```
{'emp_name': 'Ali',
 'emp_age': 22,
 'emp_salary': 30000.0,
 'emp_address': 'Gulshan'}
```

In [51]:
```
1 emp_dict['emp_no'] = ['0321-1234567', '0321-9876543']
```

In [52]:
```
1 emp_dict
```

Out[52]:
```
{'emp_name': 'Ali',
 'emp_age': 22,
 'emp_salary': 30000.0,
 'emp_address': 'Gulshan',
 'emp_no': ['0321-1234567', '0321-9876543']}
```

In [57]:
```
1 emp_dict['emp_no'][1]
```

Out[57]:
```
'0321-9876543'
```