4.Consider S and T as variables and the following relation representing the relationships:
(i) a: ¬(SVT)
(ii) b: (S&T)
(iii) c: TV¬T
(iv) d: ¬(S   S)
(v) e: ¬S ¬T
Analyze the following for PL-TT entailment and show whether
(i). 'a' entails 'b',
(ii). 'a' entails 'c',
(iii). 'a' entails 'd' and
(iv). 'a' entails 'e'

OUTPUT

```
### change s and t accordingly
s=True
t=True
a = not(s or t)
print(a)
b = s and t
print(b)
c = t or(not t)
print(c)
d = not((not s or s) and (not s or s))
print(d)
e = not(not s) and (not t)
print(e)

if a==b:
    print("a entails b")
if a==c:
    print("a entails c")
if a==d:
    print("a entails d")
if a==e:
    print("a entails e")
else:
    print("no entailment")
```

```
False
True
True
False
False
a entails d
a entails e
```

```
## change s and t accordingly
s=True
t=False
a = not(s or t)
print(a)
b = s and t
print(b)
c = t or(not t)
print(c)
d = not((not s or s) and (not s or s))
print(d)
e = not(not s) and (not t)
print(e)

if a==b:
    print("a entails b")
if a==c:
    print("a entails c")
if a==d:
    print("a entails d")
if a==e:
    print("a entails e")
else:
    print("no entailment")
```

```
False
False
True
False
True
a entails b
a entails d
no entailment
```

```
## change s and t accordingly
s=False
t=True
a = not(s or t)
print(a)
b = s and t
print(b)
c = t or(not t)
print(c)
d = not((not s or s) and (not s or s))
print(d)
e = not(not s) and (not t)
print(e)

if a==b:
    print("a entails b")
if a==c:
    print("a entails c")
if a==d:
    print("a entails d")
if a==e:
    print("a entails e")
else:
    print("no entailment")
```

```
False
False
True
False
False
a entails b
a entails d
a entails e
```

```python
## change s and t accordingly
s=False
t=False
a = not(s or t)
print(a)
b = s and t
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c = t or(not t)
print(c)
d = not((not s or s) and (not s or s))
print(d)
e = not(not s) and (not t)
print(e)

if a==b:
    print("a entails b")
if a==c:
    print("a entails c")
if a==d:
    print("a entails d")
if a==e:
    print("a entails e")
else:
    print("no entailment")
```

```
True
False
True
False
False
a entails c
no entailment
```