1.16- Tracing Python Programs

# 1. Tracing the values of all variables in the following program and show the corresponding output.

## Python Code:

**#get input from user**

**num=int(input(“Enter the number of multiplication table: \n”))**

**i=1;**

**step=10;**

**while i ≤ step:**

**print(i,‘x’,num, ‘=’,i\*num)**

**i+=1**

**print(‘End of the Program’)**

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| **Starting of the program** | | |
| Reading the variable ‘num’ from user.  Assume, users enters ‘num’ =10  i=1 (initialization)  step=3 (initialization) | | Enter the number for multiplication table:  10 |
| Iteration 1 | num=10  i=1  step = 3  while condition (i ≤ step)  i.e. while condition (1 ≤ 3): True  print(i,‘x’,num,‘=’,i\*num)  i.e. 1 ‘x’ 10 ‘=’ (1x10) ‘=’ 10  i=i+1  so i=1+1 i.e. i=2 | Output  Enter the number for multiplication table:  10  1 x 10 = 10 |
| Iteration 2 | num=10  i=2  step = 3  while condition (i ≤ step)  i.e. while condition (2 ≤ 3): True  print(i,‘x’,num,‘=’,i\*num)  i.e. 2 ‘x’ 10 ‘=’ (2x10) ‘=’ 20  i=i+1  so i=2+1 i.e. i=3 | Output  Enter the number for multiplication table:  10  1 x 10 = 10  2 x 10 = 20 |
| Iteration 3 | num=10  i=3  step = 3  while condition (i ≤ step)  i.e. while condition (3 ≤ 3): True  print(i,‘x’,num,‘=’,i\*num)  i.e. 3 ‘x’ 10 ‘=’ (3x10) ‘=’ 30  i=i+1  so i=3+1 i.e. i=4 | Output  Enter the number for multiplication table:  10  1 x 10 = 10  2 x 10 = 20  3 x 10 = 30 |
| Iteration 4 | num=10  i=4  step = 3  while condition (i ≤ step)  i.e. while condition (4 ≤ 3):False  ~~print(i,‘x’,num,‘=’,i\*num)~~  ~~i.e. 4 ‘x’ 10 ‘=’ (3x10) ‘=’ 30~~  ~~i=i+1~~  ~~so i=4+1 i.e. i=5~~ | Output  Enter the number for multiplication table:  10  1 x 10 = 10  2 x 10 = 10  3 x 10 = 30 |
| **End of the program** | | Output  Enter the number for multiplication table:  10  1 x 10 = 10  2 x 10 = 10  3 x 10 = 30  End of the Program |

# 2. Trace the values of all variables in the following program and show the corresponding output.

## Python Code:

**i = 1**

**while i < 6:**

**print(i)**

**if i == 3:**

**a=5**

**break**

**i +=1**

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| **Starting of the program** | | |
| i=1 (initialization)  step=6 (initialization) | |  |
| Iteration 1 | i=1  step=6  while condition (i < step):  i.e. while condition (1 < 6): True  print(i)  i.e. 1  if i == 3:  i.e. 1 == 3: False  ~~a=5~~  ~~break~~  i = i+1  so i=1+1 i.e. i=2 | Output  1 |
| Iteration 2 | i=2  step=6  while condition (i < step):  i.e. while condition (2 < 6): True  print(i)  i.e. 2  if i == 3:  i.e. 2 == 3: False  ~~a=5~~  ~~break~~  i = i+1  so i=2+1 i.e. i=3 | Output  1  2 |
| Iteration 3 | i=3  step=6  while condition (i < step):  i.e. while condition (3 < 6): True  print(i)  i.e. 3  if i == 3:  i.e. 3 == 3: True  a=5  break  ~~i=i+1~~ | Output  1  2  3 |
| **End of the program** | | Output  1  2  3 |

# 3. Trace the values of all variables in the following program and show the corresponding output.

## Python Code:

**i = 0**

**while i < 6:**

**i=i+1**

**if i == 3:**

**a=5**

**continue**

**print(i)**

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| **Starting of the program** | | |
| i = 0 (initialization)  step = 6 (initialization) | |  |
| Iteration 1 | i = 0  step = 6  while condition (i < step)  i.e. while condition (0<6): True  i = i+1  i.e. i = 0+1 = 1  if i==3:  i.e. 1==3: False  ~~a=5~~  ~~continue~~  print(i)  i.e. i=1 | Output  1 |
| Iteration 2 | i = 1  step = 6  while condition (i < step)  i.e. while condition (1<6): True  i = i+1  i.e. i = 1+1 = 2  if i==3:  i.e. 2==3: False  ~~a=5~~  ~~continue~~  print(i)  i.e. i=2 | Output  1  2 |
| Iteration 3 | i = 2  step = 6  while condition (i < step)  i.e. while condition (2<6): True  i = i+1  i.e. i = 2+1 = 3  if i==3:  i.e. 3==3: True  a=5  continue  ~~print(i)~~ | Output  1  2 |
| Iteration 4 | i = 3  step = 6  while condition (i < step)  i.e. while condition (3<6): True  i = i+1  i.e. i = 3+1 = 4  if i==3:  i.e. 4==3: False  ~~a=5~~  ~~continue~~  print(i)  i.e. i=4 | Output  1  2  4 |
| Iteration 5 | i = 4  step = 6  while condition (i < step)  i.e. while condition (4<6): True  i = i+1  i.e. i = 4+1 = 5  if i==3:  i.e. 5==3: False  ~~a=5~~  ~~continue~~  print(i)  i.e. i=5 | Output  1  2  4  5 |
| Iteration 6 | i = 5  step = 6  while condition (i < step)  i.e. while condition (5<6): True  i = i+1  i.e. i = 5+1 = 6  if i==3:  i.e. 6==3: False  ~~a=5~~  ~~continue~~  print(i)  i.e. i=6 | Output  1  2  4  5  6 |
| Iteration 7 | i = 6  step = 6  while condition (i < step)  i.e. while condition (6<6): False  ~~i = i+1~~  ~~if i==3:~~  ~~a=5~~  ~~continue~~  ~~print(i)~~ | Output  1  2  4  5  6 |
| **End of the program** | | |

# 4. Trace the values of all variables in the following program and show the correspoonding output.

## Python Code:

**print(“Program-1”)**

**i=1**

**while i<=3:**

**j=1**

**print(“\n”)**

**while j<=5:**

**print(‘\*’)**

**j=j+1**

**i=i+1**

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| --- | --- | --- |
| **Start of the program** | | |
| Printing (“Program-1”)  i=1(initialization)  j=1 (initilization) | | Output  Program-1 |
| Iteration 1 | Print(“Program-1”)  i = 1  while i ≤ 3:  i.e. while 1 ≤ 3: True  j=1  print(“\n”)  while j ≤ 5:  i.e. while 1 ≤ 5: True  print(‘\*’)  j = j+1  i.e j= 1+1 = 2  i = i+1  i.e. i = 1+1 =2 | Output  Program-1  \*  \* \* \* \* |
| Iteration 2 | Print(“Program-1”)  i = 2  while i ≤ 3:  i.e. while 2 ≤ 3: True  j=2  print(“\n”)  while j ≤ 5:  i.e. while 2 ≤ 5: True  print(‘\*’)  j = j+1  i.e j= 2+1 = 3  i = i+1  i.e. i = 2+1 =3 | Output  Program-1  \*  \* \* \* \*  \* \* \* \* \* |
| Iteration 3 | Print(“Program-1”)  i = 3  while i ≤ 3:  i.e. while 3 ≤ 3: True  j=3  print(“\n”)  while j ≤ 5:  i.e. while 3 ≤ 5: True  print(‘\*’)  j = j+1  i.e j= 3+1 = 4  i = i+1  i.e. i = 3+1 =4 | Output  Program-1  \*  \* \* \* \*  \* \* \* \* \*  \* \* \* \* \* |
| Iteration 4 | Print(“Program-1”)  i = 3  while i ≤ 3:  i.e. while 4 ≤ 3: False    **End of the program** | Output  Program-1  \*  \* \* \* \*  \* \* \* \* \*  \* \* \* \* \* |

# 5. Trace the values of all variables in the following program and show the correspoonding output.

**i=1**

**while i<=3:**

**j=1**

**print(“\n”)**

**while j<=5:**

**print(j,end=“-”)**

**j=j+1**

**i=i+1**

|  |  |  |
| --- | --- | --- |
| i = 1 (initialization)  j =1 (initialisation) | |  |
| Iteration 1 | i = 1  while i ≤ 3:  i.e. 1 ≤ 3: True  j=1  print(“\n”)  while j≤5:  i.e. 1≤5: True  print(j,end=“-”)  j=j+1 #added till j=5  i=i+1  i.e. i=1+1=2 | Output:  1-2-3-4-5- |
| Iteration 2 | i = 2  while i ≤ 3:  i.e. 2 ≤ 3: True  j=1  print(“\n”)  while j≤5:  i.e. 1≤5: True  print(j,end=“-”)  j=j+1 #added till j=5  i=i+1  i.e. i=2+1=3 | Output:  1-2-3-4-5-  1-2-3-4-5- |
| Iteration 3 | i = 3  while i ≤ 3:  i.e. 3 ≤ 3: True  j=1  print(“\n”)  while j ≤ 5:  i.e. 1 ≤ 5: True  print(j,end=“-”)  j=j+1 #added till j=5  i=i+1  i.e. i=2+1=4 | Output:  1-2-3-4-5-  1-2-3-4-5-  1-2-3-4-5- |
| Iteration 4 | i = 4  while i ≤ 6:  i.e. 4 ≤ 6: False  ~~j=1~~  ~~print(“\n”)~~  ~~while j ≤ 5:~~  ~~print(j,end=“-”)~~  ~~j=j+1~~  ~~i=i+1~~  **End of the program** | Output:  1-2-3-4-5-  1-2-3-4-5-  1-2-3-4-5- |

THE END

This Presentation is created by Akshat Kumar [20MIS0183] under guidance of Mr. Shunmuga Perumal Sir.

THANK YOU !!!!!