Software Test Cases

Insert Command

1.1

Description: The user will attempt to insert a valid string to the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “i” to execute the run command menu, and then enter “aaabbb” for a new input string.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: i

Input string for the Turing Machine: aaabbb

aaabbb successfully entered into the input string list

1.2

Description: The user will attempt to insert an invalid string to the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “i” to execute the run command menu, and then enter “aaabbc” for a new input string.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: i

Input string for the Turing Machine: aaabbc

Input string aaabbc is not a valid string this machine can operate on.

Ignoring string aaabbc

1.3

Description: The user will attempt to insert a duplicate valid string to the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “i” to execute the run command menu, and then enter “aabb” for a new input string.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: i

Input string for the Turing Machine: aabb

Input string “aabb” is already in the input string list.

Ignoring string aabb

**Delete Command**

2.1

Description: The user will attempt to delete a valid string selection from the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “d” to execute the run command menu, and then enter “1” for string selection.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: d

Select number of input string to remove: 1

Removed aabb from the input string list

2.2.1

Description: The user will attempt to delete an invalid string selection from the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “d” to execute the run command menu, and then enter “0” for string selection.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: d

Select number of input string to remove: 0

Error: Integer needs to be between 1 and 2

2.2.2

Description: The user will attempt to delete an invalid string selection from the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “d” to execute the run command menu, and then enter “-1” for string selection.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: d

Select number of input string to remove: -1

Error: Requires an integer value.

Input list unchanged

2.2.3

Description: The user will attempt to delete an invalid string selection from the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “d” to execute the run command menu, and then enter “3” for string selection.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: d

Select number of input string to remove: 3

Error: Integer needs to be between 1 and 2

2.2.4

Description: The user will attempt to delete an invalid string selection from the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “d” to execute the run command menu, and then enter “a” for string selection.

Input state or configuration: Input string list contains “aabb” and “abab” only.

Expected result: Console displays in order:

Command: d

Select number of input string to remove: a

Error: Requires an integer value.

Input list unchanged

**Set Command**

3.1

Description: The user will attempt to change the transition setting to a valid setting other than the current value

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “e” to execute the run command menu, and then enter “32” for a new setting.

Input state or configuration: Turing machine’s transition setting set to “1”.

Expected result: Console displays in order:

Command: e

Select max number of transitions for each “Run” command <Current: 1>: 32

Number of transitions to run in a single operation set to 32

3.2

Description: The user will attempt to change the transition setting to the current value

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “e” to execute the run command menu, and then enter “1”for a new setting.

Input state or configuration: Turing machine’s transition setting set to “1”.

Expected result: Console displays in order:

Command: e

Select max number of transitions for each “Run” command <Current: 1>: 1

Number of transitions to run in a single operation set to 1

3.3.1

Description: The user will attempt to change the transition setting to an invalid setting

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “e” to execute the run command menu, and then enter “0” for a new setting.

Input state or configuration: Turing machine’s transition setting set to “1”.

Expected result: Console displays in order:

Command: e

Select max number of transitions for each “Run” command <Current: 1>: 0

Error: requires an integer value greater than 0

Setting unchanged

3.3.2

Description: The user will attempt to change the transition setting to an invalid setting

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “e” to execute the run command menu, and then enter “-1” for a new setting.

Input state or configuration: Turing machine’s transition setting set to “1”.

Expected result: Console displays in order:

Command: e

Select max number of transitions for each “Run” command <Current: 1>: -1

Error: requires an integer value greater than 0

Setting unchanged

3.3.3

Description: The user will attempt to change the transition setting to an invalid setting

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “e” to execute the run command menu, and then enter “a” for a new setting.

Input state or configuration: Turing machine’s transition setting set to “1”.

Expected result: Console displays in order:

Command: e

Select max number of transitions for each “Run” command <Current: 1>: 0

Error: requires an integer value greater than 0

Setting unchanged

**Truncate Command**

4.1

Description: The user will attempt to change the truncate setting to a valid setting other than the current value

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “t” to execute the run command menu, and then enter “32” for a new setting.

Input state or configuration: Turing machine’s truncate setting set to “1”.

Expected result: Console displays in order:

Command: t

Select max number of cells to show on the instantaneous description <Current: 1>: 32

Number of cells to show in the instantaneous description 32

4.2

Description: The user will attempt to change the truncate setting to the current value

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “t” to execute the run command menu, and then enter “1”for a new setting.

Input state or configuration: Turing machine’s truncate setting set to “1”.

Expected result: Console displays in order:

Command: t

Select max number of cells to show on the instantaneous description <Current: 1>: 1

Number of cells to show in the instantaneous description 1

4.3.1

Description: The user will attempt to change the truncate setting to an invalid setting

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “t” to execute the run command menu, and then enter “0” for a new setting.

Input state or configuration: Turing machine’s truncate setting set to “1”.

Expected result: Console displays in order:

Command: t

Select max number of transitions for each “Run” command <Current: 1>: 0

Error: requires an integer value greater than 0

Setting unchanged

4.3.2

Description: The user will attempt to change the truncate setting to an invalid setting

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “t” to execute the run command menu, and then enter “-1” for a new setting.

Input state or configuration: Turing machine’s truncate setting set to “1”.

Expected result: Console displays in order:

Command: t

Select max number of transitions for each “Run” command <Current: 1>: -1

Error: requires an integer value greater than 0

Setting unchanged

4.3.3

Description: The user will attempt to change the truncate setting to an invalid setting

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “t” to execute the run command menu, and then enter “a” for a new setting.

Input state or configuration: Turing machine’s truncate setting set to “1”.

Expected result: Console displays in order:

Command: t

Select max number of transitions for each “Run” command <Current: 1>: a

Error: requires an integer value

Setting unchanged

Run Command

5.1.1

Description: The user will attempt to run the Turing Machine on a valid string to be accepted by the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “1” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

0) [s0]aabb

13) XXYY-[s4]

Input string "aabb" was accepted in 13 transitions

5.1.2

Description: The user will attempt to run the Turing Machine on a valid string to be rejected by the Turing Machine

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “2” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

0) [s0]abab

Undefined transition from s3 reading a.

4) XY[s3]ab

Input string "abab" was rejected in 4 transitions

5.2.1

Description: The user will attempt to run the Turing Machine on an invalid string selection, greater than the number of strings in the list

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “3” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

Enter input string number: 3

Error: Integer needs to be between 1 and 2

5.2.2

Description: The user will attempt to run the Turing Machine on an invalid string selection, user input of 0

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “0” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

Enter input string number: 0

Error: Integer needs to be between 1 and 2

5.2.3

Description: The user will attempt to run the Turing Machine on an invalid string selection, user input of -1

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “-1” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

Enter input string number: -1

Error: Integer needs to be between 1 and 2

5.2.4

Description: The user will attempt to run the Turing Machine on an invalid string selection, user input of “a”

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “a” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

Enter input string number: a

Error: Requires an integer value.

Returning to top level

5.2.5

Description: The user will attempt to run the Turing Machine on an invalid string selection, user input of “aabb”

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu, and then select “aabb” to select the first input string on the input string list.

Input state or configuration: Turing Machine set to run 1,000,000 transitions on an individual run command, input string list contains “aabb” and “abab” only. Turing machine not currently running on a string. Truncate set to 32.

Expected result: Console displays in order:

Enter input string number: aabb

Error: Requires an integer value.

Returning to top level

5.3.1

Description: The user will use the run command after the Turing Machine was already running. String still has to be accepted or rejected following command

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu.

Input state or configuration: Turing Machine set to run 1 transition on an individual run command, input string list contains “aabb” and “abab” only. Turing machine ran once on the string “aabb”. Truncate set to 32.

Expected result: Console displays in order:

Command: r

1) X[s1]abb

2) Xa[s1]bb

5.3.2

Description: The user will use the run command after the Turing Machine was already running. String still has to be accepted or rejected following command

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu.

Input state or configuration: Turing Machine set to run 1 transition on an individual run command, input string list contains “aabb” and “abab” only. Turing machine ran 13 times on the string “aabb”. Truncate set to 32.

Expected result: Console displays in order:

Command: r

13) XXYY-[s4]

13) XXYY-[s4]

Input string "aabb" was accepted in 13 transitions

5.3.3

Description: The user will use the run command after the Turing Machine was already running. String still has to be accepted or rejected following command

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “r” to execute the run command menu..

Input state or configuration: Turing Machine set to run 1 transition on an individual run command, input string list contains “aabb” and “abab” only. Turing machine ran 4 times on the string “abab”. Truncate set to 32.

Expected result: Console displays in order:

Command: r

4) XY[s3]ab

Undefined transition from s3 reading a.

4) XY[s3]ab

Input string "abab" was rejected in 4 transitions

**Quit Command**

6.1

Description: The user will use the quit command before the Turing Machine has ever run on a string

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “q” to execute the run command menu..

Input state or configuration: Turing Machine utilizing the default settings

Expected result: Console displays in order:

Command: q

Error: Machine not actively running, no action taken

6.2

Description: The user will use the quit command after the Turing Machine has run once on a string

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “q” to execute the run command menu..

Input state or configuration: Turing Machine set to run 1 transition on an individual run command, input string list contains “aabb” and “abab” only. Turing machine ran once on the string “aabb”. Truncate set to 32.

Expected result: Console displays in order:

Command: q

Input string"aabb" was neither accepted nor rejected within 1 transitions

6.3

Description: The user will use the quit command after the Turing Machine has accepted a string.

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “q” to execute the run command menu..

Input state or configuration: Turing Machine set to run 1 transition on an individual run command, input string list contains “aabb” and “abab” only. Turing machine ran to completion on the string “aabb”. Truncate set to 32.

Expected result: Console displays in order:

Command: q

Error: Machine not actively running, no action taken

6.4

Description: The user will use the quit command after the Turing Machine has rejected a string.

Component:

1. Type: function
2. Name: main()
3. int main(int argc, char\*\* argv)

Input condition: User will enter “q” to execute the run command menu..

Input state or configuration: Turing Machine set to run 1 transition on an individual run command, input string list contains “aabb” and “abab” only. Turing machine ran to completion on the string “abab”. Truncate set to 32.

Expected result: Console displays in order:

Command: q

Error: Machine not actively running, no action taken