Supplement Table 1. Hue Garden House (HGH) geometric input dataset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | | | **Parameter Name** | **Type and Range** | **Value** |
| **Geometric spaces** | **Interior spaces** | 0 | Name | String | Bedroom 1 |
| Geometry | BRep | Closed poly surface |
| Windows | List of curves | 2 closed curves |
| Maximum number of people | Integer | 2 |
| 1 | Name |  | Bedroom 2 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 1 |
| 2 | Name |  | Bathroom |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 1 |
| 3 | Name |  | Dining room |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 4 | Name |  | Kitchen |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 5 | Name |  | Living room |
| Geometry |  | Closed poly surface |
| Windows |  | 2 closed curves |
| Maximum number of people |  | 3 |
| 6 | Name |  | Socialising space |
| Geometry |  | Closed poly surface |
| Windows |  | 2 closed curves |
| Maximum number of people |  | 3 |
| 7 | Name |  | Common space |
| Geometry |  | Closed poly surface |
| Windows |  | 2 closed curves |
| Maximum number of people |  | 3 |
| 8 | Name |  | Altar room |
| Geometry |  | Closed poly surface |
| Windows |  |  |
| Maximum number of people |  | 3 |
| 9 | Name |  | Storage 1 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 10 | Name |  | Storage 2 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| **Exterior spaces** | 0 | Name | String | Buffer space 1 |
| Geometry | BRep | Planar surface |
| 1 | Name |  | Buffer space 2 |
| Geometry |  | Planar surface |
| 2 | Name |  | Buffer space 3 |
| Geometry |  | Planar surface |
| 3 | Name |  | Pond garden |
| Geometry |  | Planar surface |
| 4 | Name |  | Front yard |
| Geometry |  | Planar surface |
| 5 | Name |  | Walkway |
| Geometry |  | Planar surface |
| 6 | Name |  | Back garden |
| Geometry |  | Planar surface |
| **Space topology connection** | | 0 | Space Connection | String, String | Bedroom 1, Common space |
| 1 | Space Connection |  | Storage 1, Common space |
| 2 | Space Connection |  | Altar room, Common space |
| 3 | Space Connection |  | Storage 2, Common space |
| 4 | Space Connection |  | Bedroom 2, Common space |
| 5 | Space Connection |  | Dining room, Common space |
| 6 | Space Connection |  | Bathroom, Dining room |
| 7 | Space Connection |  | Kitchen, Dining room |
| 8 | Space Connection |  | Living room, Common space |
| 9 | Space Connection |  | Socialising space, Common space |
| 10 | Space Connection |  | Common space, Buffer space 1 |
| 11 | Space Connection |  | Buffer space 1, Buffer space 2 |
| 12 | Space Connection |  | Buffer space 1, Buffer space 3 |
| 13 | Space Connection |  | Kitchen, Buffer space 3 |
| 14 | Space Connection |  | Buffer space 1, Pond garden |
| 15 | Space Connection |  | Pond garden, Front yard |
| 16 | Space Connection |  | Front yard, Walkway |
| 17 | Space Connection |  | Walkway, Pond garden |
| 18 | Space Connection |  | Walkway, Back garden |
| 19 | Space Connection |  | Buffer space 2, Walkway |
| 20 | Space Connection |  | Buffer space 1, Walkway |
| 21 | Space Connection |  | Walkway, Common space |

Supplement Table 2. House for Trees (H4T) geometric input dataset

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | | | **Parameter Name** | **Type and Range** | **Value** |
| **Geometric spaces** | **Interior spaces** | 0 | Name | String | Library |
| Geometry | BRep | Closed poly surface |
| Windows | List of curves | 2 closed curves |
| Maximum number of people | Integer | 3 |
| 1 | Name |  | Altar room |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 2 | Name |  | Kitchen |
| Geometry |  | Closed poly surface |
| Windows |  |  |
| Maximum number of people |  | 3 |
| 3 | Name |  | Dining room |
| Geometry |  | Closed poly surface |
| Windows |  |  |
| Maximum number of people |  | 3 |
| 4 | Name |  | Stair 1 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 5 | Name |  | Bathroom 1 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 1 |
| 6 | Name |  | Corridor 1 |
| Geometry |  | Closed poly surface |
| Windows |  |  |
| Maximum number of people |  | 3 |
| 7 | Name |  | Bedroom 1 |
| Geometry |  | Closed poly surface |
| Windows |  | 3 closed curves |
| Maximum number of people |  | 3 |
| 8 | Name |  | Storage |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 9 | Name |  | Bedroom 2 |
| Geometry |  | Closed poly surface |
| Windows |  | 2 closed curves |
| Maximum number of people |  | 1 |
| 10 | Name |  | Stair 2 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 3 |
| 11 | Name |  | Bathroom 2 |
| Geometry |  | Closed poly surface |
| Windows |  | 1 closed curves |
| Maximum number of people |  | 1 |
| 12 | Name |  | Corridor 2 |
| Geometry |  | Closed poly surface |
| Windows |  |  |
| Maximum number of people |  | 3 |
| **Exterior spaces** | 0 | Name | String | C1 (Connecting space 1) |
| Geometry | BRep | Planar surface |
| 1 | Name |  | C2 |
| Geometry |  | Planar surface |
| 2 | Name |  | C3 |
| Geometry |  | Planar surface |
| 3 | Name |  | Front yard |
| Geometry |  | Planar surface |
| 4 | Name |  | Central yard |
| Geometry |  | Planar surface |
| **Space topology connection** | | 0 | Space Connection | String, String | Central yard, Library |
| 1 | Space Connection |  | Library, C1 |
| 2 | Space Connection |  | C1, Corridor 1 |
| 3 | Space Connection |  | Corridor 1, Bathroom 1 |
| 4 | Space Connection |  | Corridor 1, Stair 1 |
| 5 | Space Connection |  | Corridor 1, C2 |
| 6 | Space Connection |  | C2, Dining room |
| 7 | Space Connection |  | Dining room, Central yard |
| 8 | Space Connection |  | Dining room, C3 |
| 9 | Space Connection |  | C3, Kitchen |
| 10 | Space Connection |  | Kitchen, Central yard |
| 11 | Space Connection |  | Central yard, Altar room |
| 12 | Space Connection |  | Front yard, Central yard |
| 13 | Space Connection |  | Bedroom 2, Library |
| 14 | Space Connection |  | Bathroom 2, Corridor 2 |
| 15 | Space Connection |  | Stair 2, Corridor 2 |
| 16 | Space Connection |  | Dining room, Bedroom 1 |
| 17 | Space Connection |  | Kitchen, Storage |
| 18 | Space Connection |  | Stair 1, Stair 2 |

Supplement Table 3. Agent construction of ‘Mother’ for House for Trees (H4T) and Hue Garden House (HGH)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Category** | | | **Parameter Name** | **Type and Range** | **Value** | |
| **H4T** | **HGH** |
| **Physical Data** | | | Age | Float (1-100) | 30 | 30 |
| Gender | Boolean | False (Female) | False (Female) |
| Mobility | Float % (0-100) | 100% | 100% |
| **Psychological Data** | | | Carefulness Value (Cp) | Float (0-1) | 0.4 | 0.4 |
| Sociable Value (Sp) | Float (0-1) | 0.5 | 0.5 |
| Life Enjoyment (Ep) | Float (0-1) | 1.0 | 1.0 |
| Self-Perception (SP) | Float (0-1) | 0.7 | 0.7 |
| EQ | Float (0-1) | 0.6 | 0.6 |
| **Behaviour data** | **Scheduled behaviours** | 0 | Name | String | Cook | Cook |
| Location | String | Kitchen | Kitchen |
| Begin | Time (0:00 – 24:00) | 16:00 | 16:00 |
| End | Time (0:00 – 24:00) | 17:00 | 17:00 |
| 1 | Name |  | Dinner | Dinner |
| Location |  | Dining room | Dining room |
| Begin |  | 18:00 | 18:00 |
| End |  | 19:00 | 19:00 |
| 2 | Name |  | Sleeping | Sleeping |
| Location |  | Bedroom 1 | Bedroom 1 |
| Begin – End |  | 22:00 | 22:00 |
| End |  | 6:00 | 6:00 |
| **Unscheduled behaviours** | 0 | Name | String | Going out | Going out |
| Location | Choosing from list | Front yard | Front yard |
| Time | Float hour (0-24) | 4 hour | 4 hour |
| Motive | Choosing from list | Sociable value | Sociable value |
| DimensionRequirement | Float % (0-100) | 100% | 100% |
| OpennessRequirement | Float % (0-100) | 100% | 100% |
| 1 | Name |  | Inviting friends | Inviting friends |
| Location |  | Dining room | Socialising space |
| Time |  | 2 hours | 2 hours |
| Motive |  | Sociable value | Sociable value |
| DimensionRequirement |  | 90% | 90% |
| OpennessRequirement |  | 80% | 80% |
| 2 | Name |  | Washing clothes | Washing clothes |
| Location |  | Kitchen | Kitchen |
| Time |  | 2 hours | 2 hours |
| Motive |  | Carefulness value | Carefulness value |
| DimensionRequirement |  | 60% | 60% |
| OpennessRequirement |  | 60% | 60% |
| 3 | Name |  | Shower / Toilet | Shower / Toilet |
| Location |  | Bathroom 1 or 2 | Bathroom |
| Time |  | 0.5 hour | 0.5 hour |
| Motive |  | Physical State | Physical State |
| DimensionRequirement |  | 30% | 30% |
| OpennessRequirement |  | 30% | 30% |
| 4 | Name |  | Watching TV | Watching TV |
| Location |  | Bedroom 1 | Common space |
| Time |  | 2 hours | 2 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 70% | 70% |
| OpennessRequirement |  | 50% | 50% |
| 5 | Name |  | Reading book | Reading book |
| Location |  | Library | Bedroom 1 |
| Time |  | 2 hours | 2 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 20% | 20% |
| OpennessRequirement |  | 90% | 90% |
| 6 | Name |  | Praying | Praying |
| Location |  | Altar room | Altar room |
| Time |  | 2 hours | 2 hours |
| Motive |  | Carefulness value | Carefulness value |
| DimensionRequirement |  | 40% | 40% |
| OpennessRequirement |  | 10% | 10% |
| 7 | Name |  | Having tea | Having tea |
| Location |  | Central yard | Pond garden |
| Time |  | 2 hours | 2 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 40% | 40% |
| OpennessRequirement |  | 90% | 90% |

Supplement Table 4. Agent construction of ‘Son’ House for Trees (H4T) and Hue Garden House (HGH)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Category** | | | **Parameter Name** | **Type and Range** | **Value** | |
| **H4T** | **HGH** |
| **Physical Data** | | | Age | Float (1-100) | 17 | 17 |
| Gender | Boolean | True (Male) | True (Male) |
| Mobility | Float % (0-100) | 100% | 100% |
| **Psychological Data** | | | Carefulness Value (Cp) | Float (0-1) | 0.2 | 0.2 |
| Sociable Value (Sp) | Float (0-1) | 0.9 | 0.9 |
| Life Enjoyment (Ep) | Float (0-1) | 1.0 | 1.0 |
| Self-Perception (SP) | Float (0-1) | 0.6 | 0.6 |
| EQ | Float (0-1) | 0.6 | 0.6 |
| **Behaviour data** | **Scheduled behaviours** | 0 | Name | String | Go to school | Go to school |
| Location | String | Front yard | Front yard |
| Begin | Time (0:00 – 24:00) | 8:00 | 8:00 |
| End | Time (0:00 – 24:00) | 13:00 | 13:00 |
| 1 | Name |  | Dinner | Dinner |
| Location |  | Dining room | Dining room |
| Begin |  | 18:00 | 18:00 |
| End |  | 19:00 | 19:00 |
| 2 | Name |  | Sleeping | Sleeping |
| Location |  | Bedroom 2 | Bedroom 2 |
| Begin – End |  | 22:00 | 22:00 |
| End |  | 6:00 | 6:00 |
| **Unscheduled behaviours** | 0 | Name | String | Going out | Going out |
| Location | Choosing from list | Front yard | Front yard |
| Time | Float hour (0-24) | 4 hour | 4 hour |
| Motive | Choosing from list | Sociable value | Sociable value |
| DimensionRequirement | Float % (0-100) | 100% | 100% |
| OpennessRequirement | Float % (0-100) | 100% | 100% |
| 1 | Name |  | Inviting friends | Inviting friends |
| Location |  | Dining room | Socialising space |
| Time |  | 2 hours | 2 hours |
| Motive |  | Sociable value | Sociable value |
| DimensionRequirement |  | 90% | 90% |
| OpennessRequirement |  | 80% | 80% |
| 2 | Name |  | Studying | Studying |
| Location |  | Library | Common space |
| Time |  | 2 hours | 2 hours |
| Motive |  | Carefulness value | Carefulness value |
| DimensionRequirement |  | 80% | 80% |
| OpennessRequirement |  | 80% | 80% |
| 3 | Name |  | Shower / Toilet | Shower / Toilet |
| Location |  | Bathroom 1 or 2 | Bathroom |
| Time |  | 0.5 hour | 0.5 hour |
| Motive |  | Physical State | Physical State |
| DimensionRequirement |  | 30% | 30% |
| OpennessRequirement |  | 30% | 30% |
| 4 | Name |  | Watching TV | Watching TV |
| Location |  | Library | Common space |
| Time |  | 2 hours | 2 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 80% | 80% |
| OpennessRequirement |  | 30% | 30% |
| 5 | Name |  | Reading book | Reading book |
| Location |  | Library | Bedroom 2 |
| Time |  | 1 hours | 1 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 20% | 20% |
| OpennessRequirement |  | 90% | 90% |
| 6 | Name |  | Music | Music |
| Location |  | Bedroom 2 | Bedroom 2 |
| Time |  | 2 hours | 2 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 60% | 60% |
| OpennessRequirement |  | 30% | 30% |
| 7 | Name |  | Computer | Computer |
| Location |  | Bedroom 2 | Bedroom 2 |
| Time |  | 2 hours | 2 hours |
| Motive |  | Life Enjoyment | Life Enjoyment |
| DimensionRequirement |  | 80% | 80% |
| OpennessRequirement |  | 60% | 60% |