[붙임2] 한이음 ICT멘토링 프로젝트 중간보고서 서식



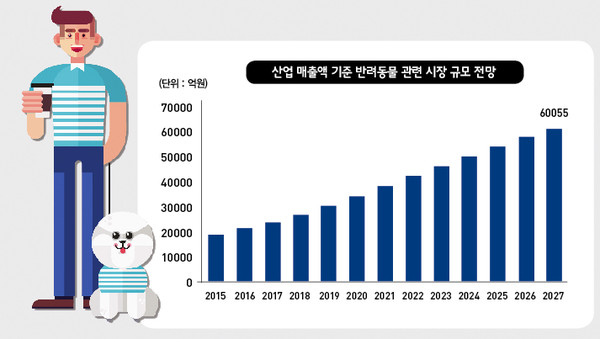
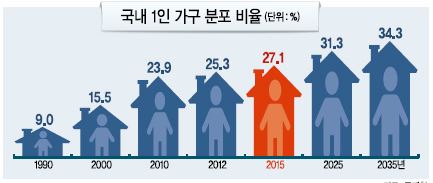
|  |
| --- |
| **한이음 ICT멘토링 프로젝트 중간보고서** |

|  |  |
| --- | --- |
| **프로젝트 정보** | |
| **프로젝트명** | IOT를 활용한 반려묘 스마트 화장실 |
| **프로젝트**  **소개** | 현재 반려동물인구가 천만이 넘었지만 그와 반대로 반려동물용품은 보급화가 어려울 정도의 가격대를 형성하는 경우가 많다. 그중 대표적인 것이 반려묘 자동화장실이다. 현재 시중에 있는 수십, 수백만원대의 자동화장실에는 사용빈도가 낮은 부가기능들이 많이 적용되어 있고 이로 인해 가격대가 높아진다고 볼 수 있다. 우리는 이 프로젝트를 통해 핵심기능만을 지닌, 기존 제품 대비 상대적으로 보급에 유리한 반려묘 자동화장실을 소개해보고자 한다. |
| **구성도** |  |
| **개발배경 및 필요성** | 1인 가구의 증대로 현대인들은 외로움을 겪고 있다  이에 따라 반려동물에 대한 수요는 점차 증가하고 있으며 그중 고양이와 개가 가장 친숙하면서 큰 시장이라고 볼 수 있다.  그중 실내에서 더 키우기 적합한 고양이에 포커스를 두고 애묘인들이 가장 힘들어하는 것이 화장실 관리라는 것을 보고 해당 제품을 기획하게 되었다 |
| **특・장점** | 기존 타제품의 다양한 기능 중 핵심기능만을 적용하여 저렴한 가격형성이 가능해진다. |
| **주요**  **기능** | 배변 처리 : 제품의 주요 기능으로, 모래 속에 있는 배변을 자동으로 걸러서 하부 배변 봉투로 분리해주는 기능이다.  모래 평탄화 : 배변 처리 이후 배변용 모래를 평탄화 한다.  고양이 무게 확인 : 반려묘와 변의 무게를 확인한다.  IOT : 제품의 원격제어가 가능하다.  라돈 측정 : 배변용 모래의 라돈 수치를 확인한다.  탈취 : 반려묘의 변 냄새가 외부로 새어 나가는 것을 방지한다. |
| **기대효과 및 활용분야** | 자동제어와 원격제어를 통해 외출 등의 이유로 보호자가 직접 제품을 관리할 수 없을 때 화장실 관리를 가능하게 한다. 핵심 기능만을 적용하여 원가 절감이 가능해 자동화장실의 보급화에 유리하다. |

I. 프로젝트 개요

1. 프로젝트 소개

ㅇ 반려동물 시장의 성장은 1인 가구의 증가, 소득수준 향상, 저출산, 고령화 등 다양한 사회, 환경적 요인이 복합적으로 더해져 생긴 현상이다. 국내의 반려동물 시장은 매년 15%씩 성장하고 있고 미국, 영국, 일본 등의 선진국들의 예로 볼 때 국내 반려동물 시장의 관심은 더욱 커질 것으로 보인다.



<표 1> 1인가구 증가비율(통계청) <표 2> 반려동물 시장규모 전망(농수축산신문 안희경,송형근 기자)

ㅇ 우리나라의 경우 특히 2006년 이후 반려동물로 급증하고 있는 고양이 관련 산업이 강한 성장세로 반려동물 상업 매출 증가에 큰 영향을 미치고 있다. 2012년 기준으로 국내에서 개나 고양이를 반려동물로 기르는 비율은 17.9%로 약 359만 가구, 인구수로 환산하면 천만 명에 달하며, 동물의 수로는 556만 마리로 추산되며, 그중 고양이는 116만 마리이다. 고양이의 양육 비중은 2006년 47만 7000마리에서 2012년 116만 마리로 240% 급증했는데, 이는 사회적 요인과 고양이에 대한 의식구조의 변화에 의한 것으로 볼 수 있다. 결혼과 출산율 감소, 고령화 등의 이유로 1인 가구가 늘고 그로 인한 외로움을 반려동물을 통해 해소하려는 경향이 높아지고 있으며, 고양이에 대한 부정적인 인식 개선, 고양이의 적은 채취, 소음, 적응력과 독립적인 성향이 현재 반려인들의 라이프 스타일에 잘 적응할 수 있는 점이 고양이 사육 개체수의 증가에 큰 영향을 주고 있다.

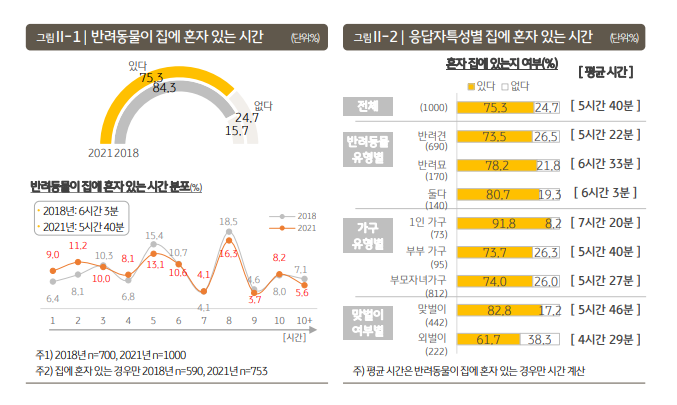
테이블이(가) 표시된 사진

자동 생성된 설명

<표 3> 반려동물 양육 시의 애로사항(KB금융그룹 2021 한국 반려동물 보고서’)

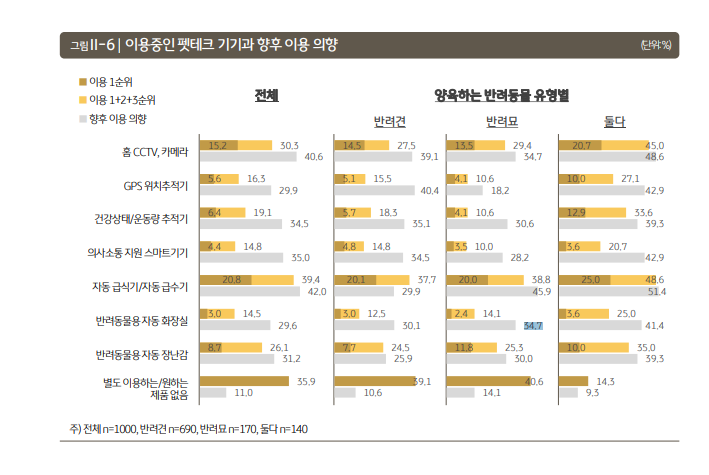
2. 추진배경 및 필요성

ㅇ 반려인들이 국내 고양이 사육 가구의 수가 급증하고 있음에도 불구하고 고양이 관련 산업 관련 제품에 대한 국내 연구는 찾아보기 힘들며, 국산 브랜드의 인지도는 현저히 낮은 상황이다. 현재 시중에 나와있는 고양이 자동화장실의 가격대는 수십만원대에서 수백만원을 호가하는 제품까지 있으며, 이는 고양이 반려인들에게 큰 부담으로 다가온다.



<표 4, 5> 반려동물이 혼자 있는 시간(KB금융그룹 2021 한국 반려동물 보고서’)

ㅇ 반려인들이 반려동물을 키우면서 생기는 문제점 1순위가 위생과 비용적인 문제점인데, 1인 가구가 증가하는 추세인 현대에 반려동물이 홀로 있게 되는 시간이 길어지는 것은 불가피하며, 이는 고양이 화장실에 방치되어 있는 변에 의한 세균증식으로 이어진다. 이는 집 안의 악취와 고양이의 건강에 직접적으로 영향을 주는 문제이며 반려인들이 뽑는 문제점 1순위와 크게 연관된다. 그렇기 때문에 자동화장실의 필요성이 부각된다.



<표 6> 펫테크 기기와 이용 의향(KB금융그룹 2021 한국 반려동물 보고서’)

텍스트이(가) 표시된 사진

자동 생성된 설명텍스트이(가) 표시된 사진

자동 생성된 설명텍스트이(가) 표시된 사진

자동 생성된 설명

<표 7> 고양이의 대변과 건강상태(헬스경향 김보람 기자)

3. 국내・외 기술 현황

ㅇ 고양이의 습성상 배변을 할 때 개방된 공간을 선호하지만 냄새 억제, 사막화 방지 등을 이유로 현재 대부분의 자동화장실은 폐쇄형으로 디자인된다.

ㅇ 현재 주류인 폐쇄형이면서 구형 디자인이 주를 이루는 고양이 화장실은 구조적, 경제적인 이유로 인해 고양이가 선호하는 공간 크기인 고양이 체장의 1.5배를 만족시키기 힘들다.

ㅇ 어플과의 연동으로 인해 실시간 모니터링, 응급 시 자동연결 기능 등 자동화장실의 편의성을 높이는 부가기능들이 많이 적용되는 추세이지만 반대로 자동화장실을 고가로 만드는 원인이기도 하다.

4. 개발목표 및 내용

ㅇ 최종 개발목표

- 필수 핵심기능과 최소한의 부가기능만 적용해 고양이 자동화장실의 경제성 확보 및 보편화 증대

ㅇ 주요 개발내용(기능중심)

- 모터와 기어의 동력전달에 의한 회전운동을 이용한 배변처리와 모래 평탄화

- Wifi 모듈과 컴퓨터 모듈의 연결을 통한 앱 연동으로 사용자에게 핸드폰 등을 통한 제품의 원격제어 및 센서에서 산출된 정보의 가시화 제공

- 무게센서, 라돈 센서의 측정을 컴퓨터 모듈에 전달하고 그것을 신호로 하여 제품의 자동제어 수행

ㅇ 기존 기술 활용여부 및 차별성

|  |  |  |
| --- | --- | --- |
|  | 기존제품 | 반려묘 스마트 화장실 |
| 외형 | 운송, 항공기, 옅은이(가) 표시된 사진  자동 생성된 설명  (<https://catpre.com/product/38384>) | *컨테이너이(가) 표시된 사진  자동 생성된 설명* |
| 특징 | 폐쇄형  제품 회전 | 개방형  상단면 일부 회전 |
| 기술 | 고양이 배변 자동처리  무선 연동  UV 살균  체중 측정  고양이 출입 시 일시정지  LED 표기 | 고양이 배변 자동처리  무선연동  라돈 측정  체중 측정  고양이 출입 시 일시정지  LED 표기 |
| 가격 | 고가 | 저가 |

![텍스트이(가) 표시된 사진

자동 생성된 설명](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAYABgAAD/4RDQRXhpZgAATU0AKgAAAAgABAE7AAIAAAADSFAAAIdpAAQAAAABAAAISpydAAEAAAAGAAAQwuocAAcAAAgMAAAAPgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFkAMAAgAAABQAABCYkAQAAgAAABQAABCskpEAAgAAAAMwMwAAkpIAAgAAAAMwMwAA6hwABwAACAwAAAiMAAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAMjAyMjowNzoxMSAxNTozMjoyNgAyMDIyOjA3OjExIDE1OjMyOjI2AAAASABQAAAA/+ELFWh0dHA6Ly9ucy5hZG9iZS5jb20veGFwLzEuMC8APD94cGFja2V0IGJlZ2luPSfvu78nIGlkPSdXNU0wTXBDZWhpSHpyZVN6TlRjemtjOWQnPz4NCjx4OnhtcG1ldGEgeG1sbnM6eD0iYWRvYmU6bnM6bWV0YS8iPjxyZGY6UkRGIHhtbG5zOnJkZj0iaHR0cDovL3d3dy53My5vcmcvMTk5OS8wMi8yMi1yZGYtc3ludGF4LW5zIyI+PHJkZjpEZXNjcmlwdGlvbiByZGY6YWJvdXQ9InV1aWQ6ZmFmNWJkZDUtYmEzZC0xMWRhLWFkMzEtZDMzZDc1MTgyZjFiIiB4bWxuczpkYz0iaHR0cDovL3B1cmwub3JnL2RjL2VsZW1lbnRzLzEuMS8iLz48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOnhtcD0iaHR0cDovL25zLmFkb2JlLmNvbS94YXAvMS4wLyI+PHhtcDpDcmVhdGVEYXRlPjIwMjItMDctMTFUMTU6MzI6MjYuMDI2PC94bXA6Q3JlYXRlRGF0ZT48L3JkZjpEZXNjcmlwdGlvbj48cmRmOkRlc2NyaXB0aW9uIHJkZjphYm91dD0idXVpZDpmYWY1YmRkNS1iYTNkLTExZGEtYWQzMS1kMzNkNzUxODJmMWIiIHhtbG5zOmRjPSJodHRwOi8vcHVybC5vcmcvZGMvZWxlbWVudHMvMS4xLyI+PGRjOmNyZWF0b3I+PHJkZjpTZXEgeG1sbnM6cmRmPSJodHRwOi8vd3d3LnczLm9yZy8xOTk5LzAyLzIyLXJkZi1zeW50YXgtbnMjIj48cmRmOmxpPkhQPC9yZGY6bGk+PC9yZGY6U2VxPg0KCQkJPC9kYzpjcmVhdG9yPjwvcmRmOkRlc2NyaXB0aW9uPjwvcmRmOlJERj48L3g6eG1wbWV0YT4NCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgCiAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAKICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgICAgIAogICAgICAgICAgICAgICAgICAgICAgICAgICAgPD94cGFja2V0IGVuZD0ndyc/Pv/bAEMABwUFBgUEBwYFBggHBwgKEQsKCQkKFQ8QDBEYFRoZGBUYFxseJyEbHSUdFxgiLiIlKCkrLCsaIC8zLyoyJyorKv/bAEMBBwgICgkKFAsLFCocGBwqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKioqKv/AABEIAJICyQMBIgACEQEDEQH/xAAfAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgv/xAC1EAACAQMDAgQDBQUEBAAAAX0BAgMABBEFEiExQQYTUWEHInEUMoGRoQgjQrHBFVLR8CQzYnKCCQoWFxgZGiUmJygpKjQ1Njc4OTpDREVGR0hJSlNUVVZXWFlaY2RlZmdoaWpzdHV2d3h5eoOEhYaHiImKkpOUlZaXmJmaoqOkpaanqKmqsrO0tba3uLm6wsPExcbHyMnK0tPU1dbX2Nna4eLj5OXm5+jp6vHy8/T19vf4+fr/xAAfAQADAQEBAQEBAQEBAAAAAAAAAQIDBAUGBwgJCgv/xAC1EQACAQIEBAMEBwUEBAABAncAAQIDEQQFITEGEkFRB2FxEyIygQgUQpGhscEJIzNS8BVictEKFiQ04SXxFxgZGiYnKCkqNTY3ODk6Q0RFRkdISUpTVFVWV1hZWmNkZWZnaGlqc3R1dnd4eXqCg4SFhoeIiYqSk5SVlpeYmZqio6Slpqeoqaqys7S1tre4ubrCw8TFxsfIycrS09TV1tfY2dri4+Tl5ufo6ery8/T19vf4+fr/2gAMAwEAAhEDEQA/APpGsubxHp0DziRrnbblhLItnMyKV6/OE2/rWpXMazp95a6bfJ9vgWyvJsFfsZeRTKwX73mgEAsD06UdRSvbQ3bLUYL/AH+QlymzGfPtZYc59N6jPTtTYNUgubtraOO6Ei5yZLOVE49HZQp/A802K0u5reaHWZLK9ikXAjS1MakdwwZ3yOnpXJ6T4eEmoQvJo1o6rKy3TNb2Zt1xkERFF8zIbGN/bOeaa3sS3JI7Gwvo9RtftECuqeY8eHAByrFT09wagvtc0/Tp/JupmDhN77IXkEa/3nKghB15bA4Poao+E4JE02WVrqWRJLmfbCwTbHiZ+mFB59yahOoWWj6lrK6tKsbXTrLAjnmdPLVdqf3juBG0c8j1FS2O+hufbovt0NqMs00TTKwwV2qVHX/gQqk/ibR4by5tbzULa0mt5AjLczJGWyobIBOSPmxn1BrO0W2ntJ9Et7kbJ49KkVlPO07ouD9K5vXLq4sdYuVa9thctIpm8u7NqrcKN2z7cpztA6qM4H1qra29fzJcna/9bHeabrFlqzXP9nzLOlvII2ljYMjEqG+UgnPXH1zSajqn2Ce2gSzuLua5LBEgKA/KMkkuyj9awvBUz3IvJILiKSITYmyrSO77FwfN+0SggDAx/KrHiZ3E0BmtIJFVj9nZNQuIZ2JHzBUhjLHjrgnjk0noNSbjc1bXULm4uBHLo97aqQcyzPCVH/fMjH9KtXV1DZ2z3F1II4oxlmP+eT7VyOlXNwdSRbe0ZLjBKR3ur3y7x3ISaIB8ewOOOldFrkUk2lukcUDjId2muTAI9vzBwwVuQQD0xQ9EOLuOttasrt5EiaZZY08wxT27wuV9QrgEjtkcU8anB/ZcOoFJzDMiuqxwNI4DDI+VAT3rloLnVLbdf6pbTXO4SW6StLJKyJnllSK2VcNgEM2MgDkVdeXTB4X0iG/06PVLl7WP7NaGFZGY7FBIyMKORljgCjo/l+oub9f0NyTVII9OW9KTeUzKoV4mjfLMFGVcAjk9+1WpJEijaSVlREBZmY4CgdSTXF2EUVj4ZuLF4VtL8XkU1zbLGEVC0y4KAcFMAAEenODkV11/Zxahp89pcbvKnjKNtOCAR2oeiHF33K9prlhezrDBJKsjqWjE0EkXmAdSm9Ru/DPUUh1u2Hh/+19kv2fy/M24G/GcdM4/Wsae9S3tbDVtW1W3u4I/ns44kS1MpKldxMsgBIVjwNvU8HjDNPs7JfB4TTLbTbmGdNl5I90sG4/7TxBwW5/vcetMXM9jraK5b+xdS/58/wDy5b3/AOIroIvtj2GJVht7raQArtMinsckKW7en170hp3K0uqXccromhahKqkgOklvhvcZlB/MClt9btpNLnvrlZLOK3d0mE5XKFTg/dJB/AmsrUYdRj1HTJb7W9NhmEzJbL/Z74kdkIwf33pn05xRe6TqVto8i77e6WO5S7MFtbOjSESiR/vStknnA9cUCuzS/wCEhsGtZZ4zM3kyxxSRNC0ciF2AUlXAIHzZz9cVds7yO+tzNEGCiR48MOcqxU/qK5HWUl1G8l1SEXVrao1pDtlh8s3DCcE5V13ALuGDxk56iuh8Pf8AIKb/AK+rj/0c9PpcaepZXU7NrYXAm/dGbyA20/f37MdP73GelR2esW97cRwxJIGkSVwWAxiOTYe/r09q5SKK4G23M2rB/wC1fM+y/YD5G37Tu3eZ5XTHzZ3/AOFXPDa3A1uMzSxvEYbvylSMqyj7SM7juO78AKFrb5/lclyd2v63sdTb3MV3EZLd96B2TOCOVYqRz7g1LXIyz6xo7atBZ3Vi0NlA18oltHLN5jSNsJEoHG3rjv0rpdP+1mzRr+aGWVvm3QwmNQCOmCzfnmkXfWxJNcxW7RCZtpmcRoME7mwTj8gabJdxx30FowbzJkd1IHAC4zn/AL6Fc74lFrayC41qaSZXYizEU0Nv9lIAO8GSRdz5784HGACcx6Lr0OrazZRtKZru3tpdzI9uwlyU5IjlfaeB7Hnp0oWonKzsb+q6vaaNbRz3z7UklWJcY6k9eewGSfQA1erlnuV0+4e/v9C1aeaZxCJbiS2fYHYKEVRLhQSQOAM9WJ61a0yG6t2mgsbLUNPjdcxLetDNBCR2VUlLgf7IIUdsUdA5tSCfxzp9vcSQvF80blD/AKdZjkHHQzAj8RmtrStTh1jTIr62V1jl3YDkE8MQeVJB5HUEivOpL5baaWJb+OLbI2UivhGoJJJwo1EY5zxgV2vhKea60RLhrlZ4HLCLKNvGGIbLtLJu5HGD0pr4bkKT5rGheapBYyrHNHdMzDIMNnLKPxKKQPxp4vo21NrEK/mrCJicfLtJI/PiuT17Q0n1yYQ6VDI0kXmxfZYLMu7ZO5pfOG7GSvK++eavWGmtb+JoYomSw8nT42lgso0WJ2MjbhgqSBnPTBpLW39dym3d/wBdjTt/EVhdSItuLyQO2xXFhPsJzj7+zbjPfOKnTVbYx38jlo47BykzMOOEDkjGcjDVj6Hq0dhosNrcWmoi4jLgounznJ3Ej5tm38c496itbS91JfEkEcsUUVzI8YikiO9XaCMZLhiMDPTafrR/l/kO+q9f8zSPirSI2jFzPLaLIcJJeWstujHGcb5FC9Per2nahBqlkt3ZtuhZmVWyCG2sVyCCQQcce1YUcOqa1JZNvt7GKxmkV57S4Mkm5VaMqFkhC9e/PtWn4dt5bbR/KuPMMgnnJaVQrMDKxDEAAcjngAc09BRcnuTX2oT2cmI9LurqMLuaWJ4VVfY75FP6YqLRNci1yGWW3tbiGONtokkKMknrsZGYMB0JB68etc34jtHiu7iWZ7PVLvy2khsJNOuLrA7fIJWVM4A3bVzz71b8P2x+2s9hd2cXkjEthHYz2mMjg+U0u1c/39hzg0lsJt81jp/tMX2z7Lu/feX5m3afu5xnPTrTIbyOe4uYUDBrZgrkjgkqG4/A1y9/aQC6aXUbxpNYkQCWK2s5LqJYT/yxeNQcoeeTtJOSMdA62XSo9I1t7eLTbeyklAjivIxDCsgRRiRCAV+YDggHoe4NHS/9f1+pV9bHRWeqQXzusMd0pQZPn2ksI/AuoB/CpNPvY9R0+C8gVljnQOocYIB9cV594fuNDGuReWLENFxJ58dluMmAV8jyBuY5Pv3HWut8Hrcr4XsTcyxSIYEMQjiKFVx0JLHcfcY+lOxMZNl/VtVttF05729YiJSBheSSTjgfr9AauKwdQykMpGQQeCK5i4uhp91Lq2oaLq07RkhJJZbdlhViBhFEuB9cbjnk1Y02G4t7mRLHTtR0+KRDtjuHgkt4m67giyFx6bVIX2HWkVfU0NR1uy0u4toLuXa9w+1cfwD+83oucDPqwrQrzeXWZtIu7m1ifSXeSQx3bziEvIBkcl7ws3oFbGAe2MV0ngx2n02SeGWH7I0jKkMURURsDg7T50ihfQLgU1qhc3vWNa91VLS5S2itri8unXeIbdVyF/vFmIUD6nJ7ZpLPVVubo2s9rcWVzsMiw3AUl0BALBkZlPJAxnI9ORWTrdwY9RikXT9WguWf7PDd2klviXOTt2u5BHBPzLx2xmmaTcu+qSySadrF3dwN9ne4untR5AIViAEcDGCCSFJPTJxgJf1/X3A3Z/1/Xc021x2vLmC00m+uxbSeXJJE0Kru2hsDfIp6MO1Tafqq30lzFJaz2ctsV8xLgpkAjIOUZhj8a568lurCW5vUt/EFjHczKzrEbFl3ttQY3Fjzhe9WrWPyIdQOqxalBHdx4nvr+W1VUAXaP9U3HX0/Gj7IJ+9qatpr+m3twkNvO5aXPlM0Lok2OuxyAr8c/KTxz0qxYX0eo2v2iBXVPMePDgA5Vip6e4NchBrtpc3FtY32r6PHa6a8cgnhuwWuSo+UKv8AD7gFvQdc1teEhcf2XK8k0T27XM/lIsRVl/fPnLbiG/IfjTsJSbZcn1+xgu5bZhdySwkCQQWU0oUkAgZRCOhB61YXUInvILcLIHnhaZSyFcKCowQcEH5hxj1rIjvV07WNYW5ivk+0So0UkFjLKCPKRcgqjDIIPX0qPTlnbxHbSyXd9OHs59gvoY42UB4+dqIpAPo3P0pLW39dCmzQfxNo8N5c2t5qFtaTW8gRluZkjLZUNkAnJHzYz6g1Pp2s2WrG5NhMk0du4RpUdWRjtDcEE564+ua4PXLq4sdYuVa9thctIpm8u7NqrcKN2z7cpztA6qM4H1rR0IXOpaFrSafcxSGRHjbIZ3eUxgKfN+0SgjGBjPHtR9m/kSpNz5TqrPW7C/uPJtpmLsCyFonRZQOpRmADjpypPUetWLS7jvI5HiDARyvEdw7qxB/DiucmubbW/wCx7TSbox3NvKJJTCFMloojZSGVgQpJO3DD19K0/DcbRafOjyvMy3k4MjgBm/eHk4AH5AU7alJtpf13Ld1qkFpcLBLHdM7AEGKzlkXn1ZVIH4mpFvY21OSxCt5scKzE4G3DFgPx+U1594in0Rdbud/9nM8j7YjbLYsN+CW88yjcDuByRxjHet3RiZPEAOkS6elvHp8IlW2hJic75MiJgQAN2ecN+YNJaq4ubVr+tzZ/4SCxFzHAy3iPJIIkMlhOqlj23FMfjmrVpfR3rXKxK4NtMYX3AcsADx7ciudvXLXgkvdSnXVLY744tPtJLmK23Aja6qp3ZB6ttJH3dvObGj2Jnj1K/sNQxPdztskBkKRcKCGhYgK4KnqMjjOelC/r8Au7/wBeZvRXMU8k0cT7mgfZIMH5W2hse/DCm2d5HfW5miDBRI8eGHOVYqf1FcYNZ03Q9XYWkkiSI7JeCW9tD9pIJ+chplKvnvgccFeBjpPDM0NzoST2zM0cs0zjdtyMysSPlZgee4Jz1p9Lj5tbFy51KC0uI4ZUuWaTGDFayyKOccsqkD8TSx30cupXFkqv5kEaSMSBgh92Mf8AfJrgdftEn1yWS00kypK5zINII2HByz7rSQvkjqrc5HA61u6HCsniO4eykltYYbO3U2yWv2dJDmXqjpuUZ5GCPxpLa5PM+axrf8JFYCeOJxeRtJIIkMthOilicAbigHX3q3FqEMhu87kWzfZKzdPuhsj2wwrmtTxdzNHrM0FxcxcpYw6fLewW+Tw0iqMs5XoTtHXC9zNoVs9vod++l3GnKHuWfbHZNHGgCKGQwl1KNlTwW75PWjo/67FXfNY0Rr0jwi4i0bUZLUrvWdRFhk67ghk39Ocbd3tnitO2uIru1iuLd98UyB0YDqpGQa8vbU4QhX7XbiHH+oS7QRY/uiMaht29tuMdsV6HoUks+i200rwsksavCsNuYQiFRhdu9uR7HFO2hMZNuxHceJdNtnnEjXRFuSsskdlM6IQMnLqhXj61dW9ja/e0AbekKzE44KkkD3z8prnbm21MHVtGtY7GQ34lmV5LmRGRHG3JUREcH/aq7ZWC6Trd1Kgu3h+xxkvJLLOSQz5C7ixzjHyj16Uuif8AWxV3d/11/wAi1H4gsJLqG3IvI5Jn2R+dYzxqzYJxuZAOgPftVu2vI7uS5SMMDby+U+4dTtDce2GFc1c/2veX8GsXVrNb2catHBbwqGuYN+B55XDKTjI2YJAJ6nIrU8OxPC2qRyTyXDLfHMsoUM37uPrtAH5AU1/X3oV3+P6Mv3uow2Gzz0uX35x5FrJNjHrsU4/Gl+3xf2mljtfzXgM4OMDaCBj1zz6VxHiv7Laa89y2mWBmnCI51NLVldFJ+eMNMjZ5wcjnAHGKn8MxWdxqlomi3P2WCztXWRIp7WRpSZFY7ghfCnnkYPHWiOv9eQpSabX9bnUNr+mpdGBp2ysnlNL5LmJX6bTJjYDnjBOc8dasx3kct/PaKG8yBEdiRwQ27GP++TXOtp17JHeeHIZLQ2zEyvMxfzUildmxs27WbIYBt3oSPXUSyE+taolzbiS3mt4EHmx7kfHmZGDweoyPel0Ku72LUGqQXN21tHHdCRc5MlnKicejsoU/geafYX0eo2v2iBXVPMePDgA5Vip6e4NcFaaXFaawv2/TIXiikIk8vRmkVsZ+6FtFI5xg+Y2P9qup8KWsEemPcwTSS/aJ5mO55do/eucBHxsIzg4A5Hen0uSpNuxNd+J9MsbiaG5a6R4F3yYsZ2Cr/eyExt4PPSrcWpwT3MEMazAzwtMheMphVKg5DYIPzDtXK+Lhc2lzPJcahapFqFs1qFMMaFEBJ6yXCZb5uoGPYVZ8P61Fq+uQB5lkuYLSUExGEoyl0/55zSFcYHB6888UR1/r1G5Wlb+uhu3Ou2NtdPbs0000ePMS2tpJzHnpu2KdpPocVatLy3vrcT2kqyxkkZHUEdQR1BHQg8isO2a/sda1Gx0uC1ukLLdN9omaEoZC2RkK+7lT2XHTmrPhlTLYS6jIwMuoTGaRVXaqEAJtHJzwnU9euB0CWw7u9jZooooKAjIweRWX/wAIvoB66Hpv/gJH/hWpRQFrlG00PSbCcT2Ol2VtKAQJIbdEYD6gVWTQpYXl+yazf20csrymJFgKqzEscboyep9a16KBWRDaQSW0HlzXc122c+ZMEDfT5FUfpU1FFAyBrON9RjvCW8yOJogM8YYqT+PyiqL6LJ9suJ7XV760+0OJHjiWEru2hcjfGx6KO9atFArXK1lazWqMJ7+4vSxyGnWMFfYbEX9ajv8ATI76SGYSzW9zBu8qeEjcm77wwwKkHHQg/nzV2igLGbb6NsvI7q8v7u/lhz5Pn7FEZIwSAiqCcHGTnHbGTV26t0vLOa2lzsmjaNtp5wRg1LRQ9VYa02MmPRbuKNY08QakFUBVHl23AH/bGtOFGihRHleZlGDI4AZvc4AH5AU+incSSWxBe2kd9beRKWC71fKnnKsGH6ipzzRRSGYUPhcQ2sEC6vqBjtSDbZEP7kgEZH7vngkfNnr64NXP7Eg/sSTTBLMEk3F5crvLM24t0xkkk9Me1aNFArIyv7Ivf+hh1L/v3bf/ABmtRQQoBYsQMZPU0tFAWsZiaBZnzWvt+oSzLseW6IY7c52gABVHA+6BkgE5IzVqyszZRtGLm4nTOUE77yg9A2Nx+rEn3qzRQFkQ3VrDeQeTcpvj3K+MkcqwYdPcCks7OOxtzDEWKmR5MsecsxY/qanooGFZ40SxEgPkho/KkiML/MjCRw7ZBznkfTmtCigDK/4RfQP+gHpv/gJH/hVqy0nTtNZ206wtbRnGGMEKoWHvgc1booFZFDUdL+3z206XlxaTWxYo8AQn5hggh1YfpS2mn3NvOJJtXvbpcEeXMkIU+/yRqf1q9RQFivfWUd/AkUzMqrLHKChAOUYMPwyKsUUUDMeHQZ7aPy7XXNRhiDErGqW5C5JOATET37mtK1hkt7dY5bmW6YZzLKFDH/vlQP0qaigVjOvtI+138d5Df3VlPHEYt0AjO5SQcEOjdx2xUlnY3FtMXm1W8vFK48udIQoPr8kanP41dooC2twqtaWMdnLdSRM5N1N5z7iODtVePbCirNFAzITQpYXl+yazf20csrymJFgKqzEscboyep9a0bWCS3txHNdS3TAn97MEDH/vhVH6VNRQK2tzOutHWe+a8tby5sbh0CSPb7D5ijoCHVhxk8gA80+x0tbO4luJLme7uZVCtNOVztHRQFAUDkngc55zV6igLGdc6P5t693aX11YzSqFlMGwiTHTIdWAI9Rj3zxU1hp0dgspEss80z75p5iC0hxgZwABgADAAFW6KAtrcDzVfT7KPTtPgs4CzRwIEUuckgeuKsUUDK9/ZR6jYyWs7MqSYyUIB4IPf6VYoooAyF0OaFpPsutahbxySvL5SLAVUsxY43RE4yT1NaFpbyW0Oya7mu2znzJggb6fIqj9KnooFbW5Xu7KO8e2aVmBt5hMm0jkgEc+3NFrZR2k91LGzFrqUSuGIwDtVePbCirFFAyvf2UeoWvkTMyp5iSZQgHKsGH6gVYoooAKrWFjHp1r9ngZ2TzHky5BOWYsenuTVmigAqBrON9RjvCW8yOJogM8YYqT+Pyip6KAMp9Fk+2XE9rq99afaHEjxxLCV3bQuRvjY9FHerllazWqMJ7+4vSxyGnWMFfYbEX9as0UCtrcKgtLSOzjkSIsRJK8p3HuzEn8OanooGFV1so11OS+DN5skKwkZG3CliPx+Y1YooAzJtF3Xk1zZaheWL3BDTLB5bK7AYDYkRsHAA4xnAzVmwsItPhdY2eR5XMksshy0jkAFj27DgAAY4Aq1RQKxkJoMsDzfZNa1C3jlleUxosBVWZixxuiJxk9zWjawyW9usctzLdMM5llChj/AN8qB+lTUUBbW5mXOjNNqT3ttqV5ZyyRrE4gERDBSxH30b+8elT2VlPauzT6ndXgYYCzrEAvuNiKfzq5RQFtbmbPo2+9lurPULuxknwZhB5bLIQMA4kRgDgY4xnvmpbbSobazngEksjXJLTzSMC8jEBSx4wOAOAABjpV2ijpYfW5kQ6HdQQpFF4g1JUjUKo2WxwAMD/llWpCjRQojyvMyjBkcAM3ucAD8gKfRTuJJLYzr3SDdagt5Bf3VlMsXlEwCMhlznkOjd/SpbOyuLWRmn1S7vARgJOsQA9/kRT+tXKKQW1uFV7azjtJLl4yxNxL5r7j0O0Lx7YUVYooGFVjYxnVFv8Ac/mrCYQMjbtLBvzyKs0UAZt1o7T6i97bajd2UskSxOIBEQwUsR99G5+Y9KnsrOe1LmfUrq93YwJ1iG36bEX9c1booFbW5zM3gTTZrqadpW3TStK2+0tZDliSfmeEsRz3Jrb0zT49L0+O0hYtHHnaTGidTnoiqo69hVuijpYOVXuZ+oaV9uu7e5jvbmzmt1dFeARnIbGQQ6sP4RS22mzRO32rVLq+jZSphuEh2nP+7Gp/XFX6KAt1Mr/hF9A/6Aem/wDgJH/hViz0bS9OmMun6bZ2shXaXggVGI9MgdOKu0UBZBRRRQMKwtSuNasGidLuwmWa5SJIPsbqxDNz83mnkLk529ulbtZdrp1zLqA1DV3jeaPcLeGHPlwKeM5PLOR1bAx0AHOTqJ7D7C6mm1jVIJX3R28kaxrgfKDGCfryaZe3l6+rJp2mtbwv5PnyTXEbSDG7aFChlyevOeMdDnitp1nbP4r1e7e3ia5jkjVJigLqDEMgN1ApfEyWrW8ZETS6mVZbJIZXjkZscjcjKwToW5A6Z7Udg6MbHq91Nb22/ZHOuofZLjy/mV8A5IzyAeDjqOme9WtRvL2WSSw0mCVbgjDXkseIoMj73P8ArD6BcjPDEVjxapp8K2EMFn5Wm2nz3UhVgLSY/dDnPXJbdnOMgsec1BrNx4d07XpItQ0PTJxLAk4lKWyMzMzhiTK67ug6Z757UeX9bf8ADsm+l/63/pHRadf3Uji01O0khukXJkRS0MoHG5XHAz/dbB+o5p+lXsl9FctKqgxXUsK7QeQrYH41zvh2bQtT1+VdN0TTrcW0KyrLHHbu4csRw0TMBwPY1rw6XqtnJcCw1GzWGad5gs1k7spY5IyJVB/Kn5/1uCemn9aBdalcW1zrJVlZbOzSaJGXgNiQnOOTnaO9TacNXkEM95eWUkLoGaOKzdG5HZjKw/SqMNlNc32s2V1cq801lFG8yx7RlvNGQuegz0z+NW7ex1qOOKGTVbTyowATDYsrkD3aVgP++fyo6sN0vmSaBdzXujRz3T75GklBbAHAkYDp7AVduneKzmkj++sbMvGeQK5/w82m6P4afUZ0htvMmk8+dY8M585lXcQMnrit+6hkuLcxxXMtqxxiWEIWH/fSsP0qXqiovucpYavZT6bbTXXjry55IlaRPOsxtYgEjBjyOa6qydJLGF4rv7YjKCtxlT5g9cqAv5CsOW21FNftrEeINQ8qW3llYmK33AqyAY/ddPmP6VtWVrLaxss99cXhJyGnWMFfYbFUVT11IimtGYU+p60dO1TULe4sEisnnCwvaOzMI89WEo649K0tPvp7nWr+GR/3UcMDxpgfKWDE89T0FUptA1NrTULO31O0S2vXlZg9kzOokzkbhKB39KLPT7aTxZqUkkETzwW8CRTPGC6ZVwcHqM+1L7JWvN83/wAArDxHIuoWcMWvaLqHn3KxNBbRkSBTnJB85un0q9JrE9rZ6tOyidre8EECMdoG5YwASB03Pknmm6ZDr+n6Xa2H2PTSLeJYvO+2yHOBjdt8r8cZ/HvTLSO4lt9YhW1tbx5L0rLFPIY42Bijz/C/5Y/Gn3X9br+vmLXR+f6Mkkv9TsJvs2oyWszT28kkUttC0exkGSCrM2Rz1yOmMc1paTPJdaLYzztullt43dsYySoJPFc5b6TqmnW95LJZ2bNIjqZ5NRmnkii67F3x9B9QCcE9K2fDNnbWfhuwFpbxQCS3jkcRIF3sUGWOOp96F1+X6gr3Xz/QqXeoapHqos7K+0+5mMq7rZbNy8MZIJLuJcL8vIJAyegqWLV549b1WG4hmktLbawmUJsiHlhiDyGJJ9jWHql9Npuv3NjY6lY6RaxxxyJE9zDahmYsWYBoX3cjk8Vq+HSmoWd+txqFrftMQsr211FMcFccskUeDj1B6daWvLoCa57MdBq+pxrp95fpbfY9QdUEUSMJLcuMpuYkh+wPyrgnvitLSrmW5S6MzbvLupI14AwoPArNh0jU5hYWmotamzsJFkEsTsXuCn3MqVATsTgtkjtmruh/6u+/6/pv/Qqel3bz/T/ggr2V/wCt/wDgEN9r8dprMFqCrW6nbeTYyLdmH7sMc8ZP17dMg1Wstann8QCxZ5SFnuFbMBClVxtAfbgkZ7HPrUmuXEenIlrHHY2lreGRri6u4swKeMhlBUFmz/Ew6HqeKpaNNDNrCQQTWGpRbJJPtOm70FuzYyG+dx83b5gRg4HcJA3rYgn8bSxasYzAyRo+xrJkg+0s3TAH2kE5PI+Q5HTPWtXT9bmlvNVgkt7qeW3n/dQpCBhfLQ7fMOE3ZY8Fs/hXI6rcW1pr91FFeyI9s3lBp75w4BCsQC98hI6fwgce1dL4Qf7bo99l4cyTlTLBOJGb92oDMRLLhuP73YHvQvhv5f5E3fPbz/zGad4k1C51iW1kgW48skNbwC3EsXOMt/pTHjofl/wq1BfahceC7m7gZpL8JP5RWMElldguFxgngcY5ptlo1/H/AGZbXKWcdvphzHNA7GSXClR8pUBMg5PzN6e9ULCysLbwbcaibdkkRp5pWtp3t3mKyPgM6EE8euab2HG9zbXxFZ7Rug1LOOf+JXc//G601cPGHXIDDI3Ag/keRXLibwmR/wAjH/5cEv8A8drorGCCCzRbSWSWFhuR5J2mLA853MSSPxoew4tmXo1xrWpWVtfS3dgsMwDtCtm+4LnoG83GffH4VNY6hO8OrySt5n2W5kSIEAYUIpA49yahsdJ1mwsYrKHVbMQRjarfYG8wD6mXGffbj2qtpFvFbT6zepp/228+2tEzxJGJXXYmRuYqMd8Zpb3S7fqh7Wfn+jLNg3iC9022u/7Q01PPhWXZ/Z8h27gDjPne9XdEvZdR0S1u7kIJZY9ziMELn2BJ/nXGy+Hg8N6qeDNrTXkcsJ2WnyRDy9y/6zjO1+Bxz7mu102QtaiMabLp0cWESGTy8Y9hGzAD8qej1JjfZmdq9zrWnxmeC7sJFeZI4oGs3DNucKBv83rz129ulW7S7ml8QalbO+YYI4TGuB8pYNnnr2FNh065uNSF7qzxsYGb7Lbw5KRZyN5J+85HfAAyQO5NS3sbW58ZapNPbxvNHDAscpX54wQ4O1uq59jS6FdSG71q903VYILvUbGWNpMSpFYyBkGCQoIkbLnjC4yeSBxU0XiBhpusX+ySWO1n2wxSxmFsbEOCGUEfMx5I6H0qjeXNvZTXGjtNpOlWUYXA1OIyC73DLN8zoGweCcsSeTjvd0uWe90m+eGys7p5pyrO0jpBdrtUb1yr4BXAwMg4PJ60Lb+vIV9SeK91Oz1SztdVks5xeBghtomjMbqu4ghmbcuAeeMHHHPFvRbmW70a2nuG3yOuWbAGeT6Vk2WlajZXAlt9NsYpNojE0upz3JiTPIRXQYHsCo4HpWj4c/5F20/3D/M02OO5S1u+1nT2H2K6sZ5p3ItbL7G3mSevzecBwOS2ABVnTNRurzWb2G5tZrRIoYmSGbyycsXycozcHA6ntWZqptdO1Sa3P9n2Md7F5k97qiNMs5zjyssyjgc7d2ADwvUh3hy3t3bUY9OWzgVljC6jpMIjil+9wFbcu5eQSC3UZwRgJbCfxWIk1ZZVd9X8T/2PdbiDZYgi8oDpxKhZv94HB7Vv6NdXV5pcc19F5cxZh/qzHuUMQrbTyuRg4PIzWVe22pW+q6dbJ4g1ApdPIrkxW+RtQsMfuvUVs2VnPa7/AD9Rub3djHnrENn02Iv656U+gK9zC8Q+JLvS75Yo/JtUIOGuvIPm+67rmM4+oq/balc3GvwQyRSW0T2TymCXYTuDqAcqWHQnoe9UNU0rXptUmutINvZmYqkri8yZo1zjKtAwU4J6HHPOaisdKRfElhb6hY2YFpYMbeNWMwi2yIAQ7KDu98DH60R3Xz/Jile7+X5os6rq1/peoQxyanpqpLKuUe0ceVGT95383C9MAkDLcfS3ZasW17VLK5aTbBIpjPkN5aL5SscyAbRyScE5rNu7mDS76405JtN0m3dfMebUkaT7Yzfe5Z13Y6HLMeRwBjNrw9HbXtjfJJa2k0DyiMywIfs90oRQCqMSAAAFwCRlevolsO/vFjTtfivtTltz8kUnzWUjDAukA+ZlOfmwf0weQc0R6he/2HqNzDH9quYJZ1hj2/e2sQowOvT6mua1HVJbjVLqJ9ZsrZbW6Ijiu9Qt42Qr0ZVa2YjrwdxPvWpAyHwbPeXl4l6bdpZzJp18Yw5yTgyRBATg8/L15xRurhza8vn/AJkD6yI7Fp7HxV9v1AJuSw8qI+Y+PueUqiVfpuyvfODXXRszRI0i7GKgsuc4PpXLibwmR/yMf/lwS/8Ax2uhs4YrexUWUjzRkb42luHl3Z5HzsWOPzp9Aje5i32u6lY6xGkljN9klk8uONYYmklPqp+0Zx3+5wOvrWrZ3Msuq6jDI+Y4WjEYwPlygJ/Wuel8OXst8Lh9E0l/lbe0l/I8xckbXExh3rtwQMHjPGMCrtissbatHd2X218RJJbROH3jywMbpSN3HUtjP6UugL4ia48QFZ1uLWNbjSYsrdXaZO09iuPvKuDuI6Z9mxswzRXEKTW8iSxONyOjBlYeoI61gveaoNUs5INB1GO0hhkR4VltwCTt2/KJccAH6ZrT0sjypAulSaaC5Yo4iG9jyW/dswz655p9Bp6lLWb7VdMt7jUQ1kbO3wxtyjmSROM4fIAb0G09ueeLOsTX1taSXdpd2tvDDE0kguLVpCcDPUSLj8jWXd6kl5rTR6ha36WVnJ+7jXT55BcSDo5KoRtB6DPJ57CtK/0+fVbuKO4dF0xNsjxDO+dwchW9EHBxzk9cDgrdBfVmaNX1EyoJmELt9g3xBBhDI5Eg557Y9q2NXv203TzNFGJZndIokYkAu7BVyewyefasLWLCNvERvZrRS6z2KwztHyP3rbgrfiM4re1ewbUdPMMUixzI6SxOwyA6MGXI7jI5p7q/n/kKN07eX+ZSiv8AULbUJLDUmglke2a4gnt4mjU7SAylWZuQWU5zznoMcvXVJIPCMGoSkSXL2iMoI/1srKMKAO5YgYHrUa2N9Ney6lqq28TxWrwQw28jSABsFmLFV5O0DGOMdTniqNln4U03VktPtN1a2cSxbixWIMFDPtGegJJIGcAjNLo/l+v/AAA2a+f6f8ElvfEA/sWzvrSVjuu4YrhY4i7rlgHQpgsG7YxmnXGq6ldXF1/Yy26xWcKu63cTh5WYbtgGVMfy45IPJ6cGs1L2G51O32Xmi6w81zG0qadEUmUr92Visj5C/wC1gY79Adi90W5lvbifT78Wi3kax3IMG8nGQGQ7htbBIyQw6ccUO9tP60QLV/13Zl2XidtV1FX0+6R7R5LUBF2ts3o5ZSR3yBn0xW5d6ibfWrGyBjC3CSu5fqAgHTn1P5VhPY/YdeSOKF0tlms44WIOCFSQYB744q7PoN3eSTahcTxJqayA2bJkxwKpO1T0J3And0+9gdBT01t3/RBHmsr72/Vlmx1q31LXpIdPv7e7t47ZXbyJFcK5Yjkj27VdvY7+QJ/Z1zbQYzv8+3aXPpjDrj9apwmQ+Jv3wUSfYE3hDkA7znB9Kk1iXTTGlvq1lJeRsdwQWElyoI7najAH60ui/rqyu9/60RFp19e6npk/lSW0dzDO0InETPDJtPLKu4HHUY3cEEZOKpwarqTXgguJoHEeoi2MsEBjWQeSWIwzN0bjIPan6fBqv9iTJZAWfnXBNst3lmtoDj+H16kISAAQDjGKW+0O2Sx0ywFr9qtku90wmTzN/wAjku+epLHJJ7mj/gfoTrb7/wBSexl1S/0OwuLa8to5ZIg0rT2xk3E+gV0x+tU49X1F9Lgnllh3Pqi2wkhiKrLH5mwnaxbGcHvS6Za3t34Z0y1tJo7W0a3AmkTPm4/up2XIz83Udh3EniCxtV0nTrEW8ZtRe28fksuVK7wMEHqKf2vmvzB35X6P8jauRO1s4tJI4pv4XljLqPqoZSfzFc5o+saxeXem/bLiwEN5aG6ZY7V1ZcFRtBMhH8fXHbpzXQyWFnLYiyltYHtQoUQNGCmB0G3pgYFebrFYJqE01tcaLYPDcyKiS3NpDJGUcgHH2QlemRyTjHNJfEE3ZXO0i1ia38MSahcL9olSWRAuQmf3xRQTjgdMnHTnmm3l1relafLqF5Np9xDAhklt4oHjbaBk7ZC5BI7ZUZ/2c8R2Us3/AAikSC3j1ozCRXaxaBomyzdd2xW64OByc8VjxaZex2WmK2hapLPbvE1ws17HJC20fNtjaYqOenyjHbFPrYV9EbviHW59LtY3gjEauR/pE/leWM5+XDzRndxmqC+Jrl9P0+5eOTy3u1jkmgjjlWZSHyEWKSU8YGec1N4lvI49Is7+9spoCtyqMrXIhljVsg/vEkCjOB1fHTNZlrr2kzX2m2On2uXkvRIzzX8U752MNxKTM5OMD5sjHHpRHV/P/IJO3Xp/mdRa6i9xrVxa7QIY7aGZCUKvly+QQen3RxgHrTrq5lj1mwgRsRzLKXXA5wBj+dQXOm341iW+069t4TNCkTpPatL90sQQRIuPv+/Sq/lXsev6d/aF1DcOwmK+TAYlUbV4wWY/rSK1uLp9xrWpI9wl3YQwi4ljEZs3ZtqSMv3vNAydvpVuwupptY1SCV90dvJGsa4Hygxgn68mqttpWr2MckNnqdksLTSSqJbF2Zd7lsZEoBwW9Ki0iwgHiTVLi4jjnu4WiRbp418zHlDPIHGe+MChBrc6CuafU9aOnS38dxYLGLloEia0ckfvvLBLebz69BW5aX8F/p63li32iF1JQqMb8cYGcdxjmua1GyW5kWW38FkTPOr3EksNmTImfnGTIckj/wDXR1CT0udBG2o2tpLJeeXqEoI2R2cHkkj/AIHIQfXqKw9H8T3l9qT27pHdADmO2+zhouQNzYunOB3wv+FaOl29uqzWsPhyTSoJUPmELAiv2x+6cnOD1x+NY2j3uhxi2mv9fRJLIyRQ2d3eQr9nwSnZVYnaP4s9fXmjqS9kbfhrVk1bRYZDdxXNyqgXARlJRueGA6Hiteszw4kcfh2zjhuYLpUTb5tvJvRiCc4PetOm9y1sFFFFIYUUxZo3keNJFZ4yA6hgSuRkZHbin0AFFMimjnj3wSJImSu5GBGQcEcehBFPJwMngUAFFMWaJ4BMkiNEV3iQMCpXrnPpVW01rS9Qm8mw1KzupcbtkM6u2PXANArou0UE4GTwKzP+El0IqzDWtO2qcMftaYH60D2NOiobW7tr63WeyuIriFs4kicOpx7jipiQqkscAckntQG4UU2ORJY1kidXRwGVlOQwPQg0SSxwpvldY1yBuY4GScD9aAHUUUUAFFRG7t1t2naeIQoSGkLjauDg5PTg8VLQAUUUUAFFNSWORnWN1YxttcKc7TjOD6HBB/GnUAFFFMlmjt4WlnkSKNRlndgAPqTQA+imPNHG8aySKjSNtQMwBY4JwPU4BP4U+gAoopskscQBldUDMFBY4yScAfUmgB1FNjljmTfC6yLkjcpyMg4I/MYpJZo4E3zSLGmQNzsAMk4A/EkCgB9FFNeWOPb5jqm9tq7jjcfQe9ADqKKbJIkUbSSsqIgLMzHAUDqSaAHUUisHUMpDKRkEHgimyzRwqGmkSMMwUF2AyScAfUnigB9FFNeWONkV3VWkO1ATgscZwPXgE/hQA6iimmWMTCIuvmFSwTPJA4Jx6cj86AHUUU2SWOFN8rrGuQNzHAyTgfrQA6iimGaNZliaRRI4JVCwywGMkDvjI/OgB9FFNEsZmMQdfMChimeQD0OPTg0AOoopqSxyM6xurGNtrhTnacZwfQ4IP40AOooJCqSxwBySe1NilSaJJYXWSN1DK6HIYHoQe4oAdRRRQAUUUyWaOFQ00iRhmCguwGSTgD6k8UAPoopryxxsiu6q0h2oCcFjjOB68An8KAHUUxZo3meJZEaSMAugYZXPTI7ZwafQAUUUySaOIoJZFQyNtTcwG4+g9TxQA+iimGaNZliaRRI4JVCwywGMkDvjI/OgB9FFNEsZmMQdfMChimeQD0OPTg0AOoopskscQBldUDMFBY4yScAfUmgB1FV7y/s9OiEuoXcFrGx2h55AgJ9Mmizv7PUYTLp93BdRq20vBIHAPpkd+aAuWKKKaJY2laIOpkUBmQHkA5wSPfB/KgB1FMeaNJEjeRFeQkIpYAtgZOB34oeaOOSNJJEV5DtRWYAucZwPXgE0APopgmjMxhEimVVDFNw3AHIBx6cH8qfQAUUU1ZY3kdEdWdMb1ByVzyM+lADqKKKACiiigAoopqyxu7ojqzRnDqDkqcZ59ODQA6iimxyxzJvhdZFyRuU5GQcEfmMUAOoopizRvM8SyI0kYBdAwyuemR2zg0APoqjd63pVhP5N9qdnbS4z5c1wiNj1wTVyKVJoklhdZI3UMrochgehB7igL9B1FFFABXnWoGGPXprh7hWuoJwoEptFvZCMAGOM2xLf7Pzcj0r0UjIxWQ3hjTnmWV31AyICFc6lcZXPXB8zjOKFvcmSbVkU7CdrfXNYhmtrm6i/dmS42I2cQjgoDuJPoqkc1Wt9GMGq2urWXh2ytoo9yrbRpHFcLuwPMJHyk4yNmehzkn5RtaXpX9m3l8ybfJndGjG4s3CAEsTySTk5ySeprKn8OzG9uZJ9J0nWPOlaRZ7+QiRFPSPBjfhe2CB7dydRNaD9HXV7DR5tsEczPdTeTC6GExAyud7sWOVwc/KucevWquma5YaZ5tjca5pl3BJvlW6F3EhWRjllZd3QsSQRnjg9MnodIsZNO0mG0mnMzxg/NzwCSQoyScAEAZPQVz1voOrx2qR3UX2mULh5f+EivE3n12hMD6UNboNUk0SXaRt4L06xmMhcwQsPKtJLuJym07X8sEFTj15HTNV7zU59YSGC/sJLSKKaObzYbK7mcFGBwoMCbSem7JwMjBzW9PZXiaDbW2nJFbzwGLEX2h9m1GBKb9u4ggEZI57igXGv7hu03TQM8kajIf8A2jVXu2/MVnZehbkvbYaabqeUW1uUyZLgGLaDx8wbBH44rjotZWKz0uH+0fDhOmlSD/bP+txGyf8APP5fvZ713VUbuykn1fT7pGUJbeZvBJydy4GKkpptGc9/Fr2ivHBb6TqtxvAeBLpbiCLJOGclQccZwFz2HrWXa+HJreYPpENtZ/YoHga4mssveOfvEAMpCjGF5I54GADXZkZBGce9cgvhadbb7PNpWkXc+CDqksridif+WhGwtuHXiTtwR2T1uFtmyf7N9ot/DemahH/oz2+6e3lXh3SNcIwPXBJO0/3faoHRLSLV7C1G2zt7y1MUaj5YizIWRfQZ5x23V0MmlQ3OmQWmoM9yYQhE28pJvUffDKQVPXkHuahn0WJNINlpyrHunSVmkdmLkSKzFmOSxIHU57Vbd5NkxjZIsavHdS6NeR6exW6aFxCQ2CGxxg9vrWDp9ta/2tp7aHpVxYGPcb53tmgDLsICuSP3rbsHILYwTnnnqW3BTsALY4BOATXP/wBj6uJrm4W7txPqCCO5GDttwOAY+MsQCR82Mk54xtM9SpK5DNEo8J3NjeLdQtczXCq0dnLOVzKxBKoCcYwe2fWm/wBtal/z+f8AltXv/wAXV5NN1K30GfTbeaLMKLHZTeYyMVGMB8DgjGMjOeuB0qb7R4g/6Bmm/wDgxk/+MU+otS/a3KXVqs6CQKwPEkLxtx/ssARXMjQrfU7yK503RrPSo7eTzY7ieyCyzSA8fINrBO/JDE44x16tclRuADY5AOQDWRdaVd6tMRqc6w2sUm+CG1Y7tw5V2c45B5CgYz1LUuo2rqxUs4ro6f4ijuHSe4aVxmCIoGJgTAClmP6ms+HXL9LeO0N8FmEAPknw7eFsAAf3/XjPSuhS21SWCS3u71YipHl3doqh3HcMjqyj6gnPovSq58PTm+F2de1Lz1jMQfZb/dJBIx5WOoFHl6fghO/T+rmY9ksnhnwxZ6jbK482BJYJ48jIibIKn37GrHiKy0zSvC+oxWFpaWkk0JPlwRpG0u0jsMZxn8M1rDSYZrM22qudWQvvH22KJsceioB+meaqX/hqyOj3lrpFjZWc1xHt3xwrGDz3KjNO+r8xW0+RW1e8ac2Mnl3lhd20pmVJNNkul5VkwTCSvRs8N6ZpkGuXqzobm5eSIH51j8O3iMR7Escfka19Ui1BmtJdM8pmhlLSRSzNEsilGGCQrdyD07U2GfW2mQXGn2CRE/OyXzswHqAYRn8xSQ3uXJ4re7tGjuoklgkX50mTKke4P9a4xbe3htZ9T0qwWO0uNQtVtoLaNY/OVHHzgEgfMzNgnGQAehrsb2yt9QtWtryPzIWILJuIDYOcHHUeo6HvUd9YC7ggiVhEsM8cowuRhGDY9umKFvf0/McldfJ/kc1FBe3WgaZPZQ3ayRX08ki25h82MFpR/wAtDsPLAHr7VHJp2rNYapJJFeedcXFoYWu1idztdckrCcYHXscVurpFz/wjc2nLdfZ55GlKzRE/LukZh0wehwcEfWsyPw3KZrcxaPpGlPFIrm7spGMuAeVA8tPvDIOWIweQaa3Js0kR+K4naGzi1O7gIcEs1wsMNoGHfMsUpDnPAzyAapafdyhtItYxJJam8G19o8pdu8fumjhRGQ9ckg+grrtWtrq7sGisLjyJdwJOSu9QeU3DlcjjcOR1FZdhpOqQ38Uu77JGhzJ/xNJ7zzV/ubZVAX13DkYx3NEd/mEk76di74jYpoNy+6cKq/MsCIxcHggh1YbeeTjgA1yGmpFFY6tDZ3MDx/YZJH/s57eSFvlIAkaOCMhucgZ5wfTnu7yyivohHO06qDuBguHhP5oQfwrKuPCliNPuorP7QJJkfaJr2Z4y7A/MysxBOTnOCc89al7Muzck+xE7R6hotlFd+Hmu5ioEUN3HGyJhR87OCyqOf949lNZ76Pf6fpJsLawt43OoQ3C3NrF+6b96vJiBBXaAMjOMDO7Oa6C+02e68PmwhuPIm8tF8wE4OMZHBBwcYOCDg1lQeHZPtltJFpGk6OYZVkNxYSEyMAeUwI04YcHJI9j1Fv47+f6mfK+VLy/Qfrsl00McGoX1npsETJIb2ZlRZ5l+ZVVCxwoIBOTnjA9abb61ba1e6SI7qxN1FcO0sMN7HLwInG5cHJBJHbOOoFaOvWN7fW1utg+DHOHlT7XJb+Ym1ht3xgsOSD+FUrDR7uLUoJ7myQCJiQ7a3c3BQlSMhHTaTg4696SKle+hE2nWmrXeuTarGryW0vlQSP8AetkESsGQ/wAJyxO4YPT0FP0a4mu73R7i6yZpdILuSMZJaIk4rUvdC0/ULgzXULM7KEk2SuiyqOgdVIDjk8MCOT6082T/ANuQ3ilBFHbPDt75LKRx6YU0o6Nf10f5hJb/ANdV+RV137O0Si90F9WhjBkJ2QusePaRwc49BXKR39pbrPBFp8WmRajPbT2sJlgQsmY8ERo5bJIY9Og69q7PWba7utPCaeyCVZY3KySFFkUMCyEgHgjI6HrVN4tWmtktpdH0wW6lcImoyALtIIwBCOmBxREJbkWuadDq9zJbQ6Ray3Qj2m/vbRXSIHOAu4Zc+w4Hc9jVgstSjv8ARorazj04WcE0LZQzxbcx42kMpG7HBbB4PBrU13S5dSW3MawXCQuWks7liIrgEYAYgHoeRlWGR07ivpGiSWeq/a1srHS4xEY2t7ByyzEkEM3yIMrzjgn5jyOhIhJanO6jbQnXJpo7CG7S7uC0sl54buJmgAjA4bjcMqOAP4s10uknzdWM0cMiQixiiBNq9uu5WfICOMgdOPTFQatpesya8b7SLhYke2SFh56xsSrMf4oZAR83bFS6JpurW+p3N3rE6zeZCkafvlkIwWJ+7FGMfN6GiOy/ryFa0n5/8OTeFv8AkWbX/gf/AKG1ZGpGOfQ/ERG2SKS7j91YFIfzFbb+GtCkkZ5NF053YkszWiEk+p4pbXSY0GoRXUMEttdTB1hKhl2+Wi4KkY6r0+lC/T/IrXYY2l6PpMMktrY2NlJIhiDxwpGzZH3cgDOcdPao/Cc8k3hbT/MtZbfZbRqvmFDvGwfMNrHj64PtU8fh/SrXe9hpdjbTFCokit0QjI9QM0lnaX9homm2lv8AZmlgWKK4LltpQABtuB144zTXX5fqK2q+f6GhPBFcwPDcxJNE4w8cihlYehB61y+qaV4dGnazHDodik1lbFi4tIxyUJG0gZz+VdHeW0t1GqwXs9mQcl4FjJPt86sP0rMj8OzRXM06a9qQkn2+Y2y3O7aMDjyqncrrsRatb/udM+320t5p8akXMMcZly20bWaMZLqDnjBwSDjjIyrjT55tGuY9MsJ4rN9Qga0tm3wFVDrvYADdEucnoCOTjmuivdLubnQpbFNRmeZ+lxKAGPIO0+WF4IGOMHBrLg8OyfbLaSLSNJ0cwyrIbiwkJkYA8pgRpww4OSR7HqK3d/MhrS3kPTTodR1z7FrFtHPFa2MTR280jToHZnDNl+XICgbiM89s1X0yR3j0dGkaVIdSuYYpHOSyKsqrz34GM+1dBfaTaak0b3KSCSMELJDM8TgHqNyEHB44zjgVFLparJpi2aRwwWUpbyxxhfLZQB+LChDa/r5GNcXskOs3V3p9xcReeqJIk2g3U3KbuQy7eOfetDSdWnnuTDeSySs/3Cuj3Nsq4yTlnJH8qlmXWYNUuJbOG1ubeVU2LPdvGYyAc4AjYc/WrVlJqMjP/aNrawKB8pguWlJPvmNcfrSQdTB8ZrG62sdzMqQyMf8Aj68hbZSB1Z5IpMMc4AxzzWdazNFpWnPbia7SHU1jjhgMHlNhHyYWVI1ZTnqccgj69Xf6NaamxN210QybGSK8liVh6FVYA9fSqcnhuGKaxksTJm3uFdjc3MspCBWGF3lsdRwMZwPQULT71+YSi27+T/Ig1iwi1qUwx6Lbtd+UA15f2qOsAIJCjOd7D0U7Rzk9jXgstSjv9GitrOPThZwTQtlDPFtzHjaQykbscFsHg8GtTXdLl1JbcxrBcJC5aSzuWIiuARgBiAeh5GVYZHTuK+kaJJZ6r9rWysdLjERja3sHLLMSQQzfIgyvOOCfmPI6EQNalLVtQmttSjv7u8sbCW2DC30+6uY0a4QnDMWJ+UnA24yBjk8kLoaXf2up69PdWNzbzx/Y4lYRTpIUbc5wQrHHXr09DTdZ0zUbvVI57X97brDsMP8AaU9ph92d37sHPHHNSaLps9ndTS3NokTSIF8z+05rtiASQP3ijA5PShbA73aGapbxah4ksbG+jWaz+zzTGGQZSRwyAZB4bAYnB+vYVmR4ht7izhJNtaa3BHAOyLujYoPYFiAO3TtXS32m2uooi3SMTG26N45GjdDjGVZSCODjg1Vn0eNdPtrTT0SJIbmOYhmJztcMxJ5JY88nqepojo1/XVMJJtP+ujRk6zeND4ggutNjuxcgG1mkfSp54kj5bcNqgk7go+Vsc9DjhNHvWl8Qz3WpJdtcFVtoJI9JngjeM4bLblJBDZGWbAA4Ayc6Gs6PNfX8dz9ntNRhWLy/sN8xWNWznzB8rDdjjlenQjkFNG0aax1CS5+zWenQtHs+x2LFo2bOfMPyqN3bhenUngAj/X9f1uKV+b+v6/4YgvNTiXxraKwzDBE1vJNn5Y5pdpRT9Qn5svqKv23/ACNWof8AXrb/APoUtT/2PYf2bNYG3U205YyoxJLljkkknOc985ot7F4dYubrKmKSCKJRklgUL5zn/eHf1oW1itbmJ4rnsnvLFX1KwhmtZGd4J9TNm5VkIBDJlh19OaxtK1PT7nUtP1CbUbCzjt5JCyT+IJLlz8rIMJJgDJOc56fWux1KPUTcWs2mCGTymbzYpp2iVwVwOQrZweelFvNrDXCi7sLGKE/eeK9d2H0UxAH8xTRMldmRf3jR65Ld2E9xE5hWCRZNEup1O1mIKsu0fxH1FWtM1i4kuhHezSTBxhAmiXVvg+pZywx+X1o1fRZrzUxdG2s9Th8oRizv2KxxMCSXX5WGTnByueOvan6JpEun3dxOYLSwhlUKtlZMWiBHV+VUbj04UcDknslsN35jLu9HF9Kuo6VoFlAYJvOXz7dY57lhkhuxUBsNhiCxGDtHJ1dEhvkvtRk1HaZJGjIdITGp+QcYLN06HBNWrrQtIvrgz3ul2VxMwAMk1ujsfxIzVez0NLB9QTT/AC9PhuWRo/skaKUIUAnaVK5OPQ0dLDtrcx4rTS47Yp4h0W4vNT582c2L3BkPYpKFIUegyu30FX2jv7fwROt3a/bLpY3K29wPPLLuO1XA++QuAcE5I6nrVv8Asi9/6GHUv+/dt/8AGaeNLvPKKf29qBYsDv8ALt8jrx/qsY/DtR0sLrc4yax065Wa0W305JTH83leErkSRhsgMPm46HB9q7+BkisI2LkRpECXkBUgAdSD0/GstfD06Xkl0uvakJpUWN22W/KqSQMeVj+I/nWpawSW9uI5rqW6YE/vZggY/wDfCqP0p9AirPY8/N5pQURJNpg1Xztx1v7fB65353+Z93jZjb/D93mupsZFvZtaksbliskiNHNbFGJ/dJ90sCp/Hir0ljI/iGC/DJ5UdrJCRk7ssyEfh8pp9paSW9/fzuVK3MiugB5ACKvP4il0sCTUmziNItb+C+eTT7S5tpyhJaOxjXdjna++2hBBPGBJnP5jrfDMdxH4fhF7E0U5klZ0ZNpBMjHpk46+p+p61kRaP4ltGnS0vFWFp5ZUVLpFADuW6NauQef7xrc0GyuNO0aG2vXV51Z2dlbcCWct12rnr6D6U90TFWkc1qmm61Ja6va28WqlbqSUxrC1n5DBumS58wA9+/pWvBDqEHibUbmJM23kQ5j8nLTEK/COXVQQcZznr2pmq6FJd64962laXqcT26RKt85UxFWcnH7t+DuHp0q9ounmx84f2Rpumh8f8eL7t/X737tOnbr1NJbWKa945T/hJTpdzdQ2E1vbq87yyRXb2jyLIx+YEi7Tv2IJHTPTHQeEp4301lt4ZTEztK1wXgaN3Y5YKInYKM9v1J5qs+i6qbidnj+0B5ndH/t66g+UsSo2KpVcAgcelbGi2T2FgYpLdLdjIzlUunuNxPJJdwGJJprYVnzGhRRRSNAoorN1nWo9IhjPlPcTyMAlvECXZQfnbABOFXJ6eg7igDSopkM8VzAk1vIssUihkdGyGB7g1UvdVW0uY7aG1uLy5dS/kwBchAcbiXZVAzx1yew4NAr6XL1FZia3DNb200EbHzrn7M6P8rQvzkEeoI+h6g4qwl/v1qWw8vHl26TeZu67mYYx/wAB/WgLluiimyOsUbSOcKoLE+wo2GOorNm1mNNDt9TgiMkdx5JRSwBxIygHjPTdn8KbrHiKw0XatzNE0zYIg+0wxvt5+b946jHHrRsK6tc1KKx7fxHaXs9glk0U4umZH8udHMJCFsHYWBPHrSzeI7eC7kja2uTbxTLBLeBV8qNzjg/Nu6kAkAgZ5PWjrYOZWua9FZVrrf2nUzafZ9v72aPfvz/q9vOMd934Yq6L2NtTexCt5qQrMTgbcEkD8flNAyxRVW2vPtF5eQeXt+zSKm7Od2UDZ9uuKztT8V6bpN5Ja3Jczxru8tCu5l2M+QCQcYQjPqRQBt0VgJ4x0uS6hVbiFbaSSSL7TJOqoWQKcKc4Od/r2NW9R1qXTVnkk0e+lt4FLtPE0O0qBkkAyBv0oEmnsalFVI78S6kLVY8A26zhyfUkYx+FRatqE9gLRLS3juJrqcQqssxjUfKzZJCsf4fSgLmhRWM+qara3Vol/p1mkVzOId8N6zspIJzgxLnp61Pf6nNDqEVhY20c91LG0oE83lIEBAPIViTkjgD6kcZAujSorLs9VuH1Y6bqNrFBcmEzr9nuPNUoCF5JVSDk+mD68EVNq+qDSLL7U9pcXMakBvIKZXPAJ3Mvc9s0BcvUVir4iZl1APpd3A9hCZZBO0WD8uQuUduSPan6n4lsNKhiNzLEZpFDC3+0wxuFP8X7x1GOMUBdWua9FYtv4osrwWf2J4pnuJxDJGlxG7QZV2BbYWHOz1/lW1QCaYUVkjxBbNrx04D5ANn2nPyed/zxz0345xmtajzGFFY7+JLeMySm1ujZRSGOS+Cr5SsDtPG7fgHjIXHvjmr0N752qXNn5ePIjjffu+9v3cY9tv60Cur2LVFU9Kv/AO09OS68vytzuu3dnG1yvX8M1coGFFZ95q6W139kt7W4vboKHaG3C5RTkAszMqjJBwM5PYcGnWWqR3k8lvJBNaXUah2t5wN209GBUlWHHYnHfFArl6isW41bVU1iaxttOs5BHCJhJJesm5SSOgiODweMn61b0W/uNT0mC9ubeO3+0IJESOYyfKQCMkqvPPT9aN1cL62L9FZlzrLQ6k9lbabeXkscayuYDEAoYsB991/unpUn9psL6xtpLSSFrpJHKyOu6Pbjg7SQc57GgL62L9FZVzr0cFxPHFZXd0lqQLiaBVKxHG7HLAsQCDhQ3X14qxHqcc+oW8EAEkVxbNcJMG4IBUDj33ZzRuF0XaKxx4kgLCT7Hd/YjL5X27YvlZzjON2/bu43bcd845q9bXn2i8vIPL2/ZpFTdnO7KBs+3XFAXLVFYureKdO0i4EE0kcs38ca3UEbR9xkSSKec9qmt9etb29tIbJ4riO4jkcyxTK4Qpsyp25BPz+vajcLq9jUorKvtblsHbzNHvpIw4jWWNoMOSQBgGQNyT6Zqzb3/n6reWXlbfsyRtv3Z3b93btjbQF1excoqrHqNvLqk+no2Z4I0kcZHAYnHfP8P6imQ6iJDf7oyq2UhQlTuLjYr5x/wLGPagZdorCTWtTl04alFp1kbFo/OVm1DD+XjOSPL2A47b8e/etezukvrGC7iDLHPGsihxggEZGfzp2EmmTUVWe/iTVIrA5M0sTyjGMBVKg55z1YfrTVvwdSubV1CLbwpKZC3BDFvyxs/WkMt0Vz9z410eC6SKK6t7lGxmaK+tgq8990gbjrwDV+TX9JTT2vV1Gzkt1YoJFuY9rPjO0MSBn2JoFzJuxo0VzsHjTTbm1uXjeJZoY2kSB7yBmmwpJC+W7+la0t9KljDcQWM900gBMUDICuRnOXZRQCaZcorGbxDix1GZtPuIJdPUM8M7IN2RkYKMw6Vo6hex6bp1xezhmjgjMjBBkkAds0AmmWKKw5fEjxxXjHR7xGtIDNJ5rwhV+UsASrsedvYHrUr69s0jU777Nn7Bu+TzP9ZiNX644+9jv0oC60NeisO81TXLLT57yXS9PMcMTSsF1B8kAZOP3PWrt3qqWsduBbzXFxcjMVvAAWbAyTliFAA7kj8yBQF0y/RWUdejNhLOtvIk0EyQzW02FeNmZQM4yDwwIIJB9au/bo/wC1PsG1vN8nzs4G3bux+dAX0uWKKq3V79murOHy932qUx53Y24Rmz7/AHcfjVMa7JLPPHaaPf3KwSmJpI2gClh1xukB/SgG7GtRVOG/87V7qx8rb9nijk37vvby3GO2Nv61coGFFc/L400iLUPs32iBk3AG4F7bBB65BlDcf7taNnqiX1xeJAgkS32bHjcMJQyBgR27+tHS4rq9i/RWXDrUkmowWc+kX1s8wZleRoWUBRyTskYgcgdOpFWNLv8A+0rH7R5flfvZI9u7P3HZc599uaAui5RVSy1K31Gye5tG3xo8iZyOSjFT0z6flVb+3YxpVhdG3lkmvkUw2sOGdiV3EAnAwBkkkgcUBc1KKyTr6fYbmU2s0U9s6JLbTkKy7iADlSwIIOcgkcEdQa1JZUhheWVgkaKWZj0AHU0bDWuw6ism319JZIPPsLy1huWCwXE6oEkJ+6MBiy57bgPTrgVKNZgTTbq9utkEdvLJGd8qqGKsVHzMQASR3PfrQK6Zo0Vk6X4js9Xgne12h4Blo/tEMjYx1/du2B9aedYxpumXfkf8f7xLt3/c3jPXHOPwo/r7w5la/wDWhp0UUUDCiqM2r2sGrQ6dIzCaZSytj5Qeyk9icMQO+1vSn6pqMWk6ZNezqzRwgEhcAnJx1JAHXqTQBborEu9Y1LTbY3epafaLaqRvaC+LyDJwMK0agnJHG7Ppk8Vt0CTTCiiigYHpx1rmJpNQ0RZr8aLp5knlRZJRqMjyMWcKAS0OdoLdM4A6CunqG6tYbyDyblN8e5XxkjlWDDp7gUdRNXMzS7K6ttRmmfTLKzWfLSm2vpHDN/e8sxquT3br9aTXY3sRJrdvdrbPbwFZRJD5qyIOQNu5Tuz0+bvj6bVQXFjb3U0EtxH5jW7b4wzHarf3tvQkdiRkdqAtoYMCWkMulWTXrTXV3M1/5pC4lIGTwD8oIbgDPC9+tOv9Jk1XVJI7ltEuJYkDKtzpDSskbFto3GXB5U9MfQVo/wDCPaWIZohaKFmZWYh2BUqcrtOcoAckBcAEnGM0660SzvLkXEpukl8sRloLyWLKgkgHYwz1PX1oFZ21KWmaDPpl4JYBosCtxJ9k0owu6+m4Sn+RqzrqIbMy3t00OnxgtcxJGWaYdlyOdp7gDJ6ZxkGez0q3sZTJBJdsxXaRPeTTD8nYjPvVmeCG6t3guYklikG10dcqw9CKGEVY5K6toPsclrcabqOn6feTxErOsMtvE3mBsbFcsoc8H+EE5wOal8SQXWn+Q2ipa6e8aGG1eKRt5BwWQQCFww+UH5eeM8DNbMXh7T4pY3IuZvLYMiXF5NMikdDtdiuR2OOO1Wr2wt9QjVLlGOxtyOjsjoemVZSCvBI4PQkUeguV2OP0+3Go31jbXivaGOeWdmM1xDNcuyNuIJhi56Ehe2eK0LnTNRezv9FjtGa3vLlpFvfNULHG7bmyM79wO4DAI6cjmtq20SytbhZ0E8sqZ2Nc3Mk+zPB272O0kcZFX6egKLtqcfo0aWeubF81kinvfvM0jkDyu5yzH8zUgh1B7ttauILoQX2IJbOIss0MH/LN/lOdwJYsAcgOf7vPSCxtVuluEhVZV3EMoxktjcSB1J2jk+lWKS2Q7bmNodrHZ6hq0MTSsonQgzTPK3+qX+JiT+tZPi7T4hdRzF55Wu9yG2VmwSI2XcAkEj5CufQdOtdVFbRQzTSxrh52DSHJ+YgAD9AKgv8AS7XUjEboShoSTG8M7xMuRg8oQaB200OX8OCc65CLiyuy376VrqQSgbmCDDBreIdFGMehqaWO0mvtTj11NakD3DLGkAvDE0RRcACL5COv9a37XRrazuBNFLesyg4E19NKv/fLOQfyq/TJUXaz7mLYzCfxEXSGWFPsKhVmXa2N5wcdRkdjg+oB4qDxSlw620Qt7O9imlCR2s9gs5L7WbdlpkUcA+/51ufZovtZudv74p5ZbJ+7nOMdOpqK+0631KONLoSfu38xGimeJlbBGQyEHoSOvel0X9dSrb/10OI03TLvSL63/wCJVZWclxcsIrqXSYSY2bc20FLosABkDjpxV7xTDcNcxWs08l8si+cbc2yyKhHGQotZSBz1Zs8966CPw9YR3EU5N5K8L74/Ov55VVsYztZyO57VLe6PaX9wk8/2hZUUoHgupYTtJzg7GGfxo7Ectk7HLeFre7j1M20SXdjbbfOcxWqRRuwIG1t1pEckHsc4Haug8TJdT6LJbWNlNdySkDEbIu3DA5O9h6ds1atNJt7GbzYZLxmxjE17NKv/AHy7EfjV2mxxi0rM5O4bUCuvTz6TcW0F1akiSaWI7dsTDojsc5x+Geexn8TF4tBtLhbx7ZIyoYCYRK2RxlvOiPHpv79DxjoZ4I7m3kgnXdHKpR1zjIIwRxUF5plrf20cFwr7ImDoY5XjZSBgEMpBHX1pf8Aq2n3nE2OoadqzaZpN/Ib4/bDIBLLb3CN8j/KR58j45zli3PoMAdpqVtJLphtrO3ikDAIY2uHtwF9mRSR9AKjg0O0t50ljlvyyHIEmozuv4qzkH8RWjTexMYtbnMb73f8A2D/wj2keR5Hm+T9sbytu7GMeR689K2tJgnttPWC4gSAxnCKl09x8v++6g/h2qf7LD9t+17P3/l+Vvyfu5zjHTrU1HQdrM5W7sPs93FoLansstRklkWAQDzQv33QSbhhSSf4CcEjPcaFjIl9fatc6XcosqstofNi3qjR5JOAwLA78dR0q5Jo1hN9oMkG57hg8km9t+R93DZyuO2CMZOOtOh0mxtriKa2t1heGLyk8slRs9CBw2O2c4ycdaS2t/X9f8OFtbo5+Lw2uoIbpI/DswlZiZG0M5Y5IJOZc9c1uaRYT6dbtBI1iIR/q47KzNuq9c8b2Bz+FRDw3p6ZEb38akltseo3CKCTk4AfA5Par9rax2duIYWlZQSczTPK3/fTkn9afQSjrc5rXNY0+wnvNR03XtOiv44CktrNIkgl2biF2hlYNkkcHvyDxibStR06a++1ya9p1/qc8QiihimREUddiqGZuTjJJY8cY6V0tFJDadzlBpo1CeeU+FvDs8qylZneYli/U5Jt+Tz1rW0e0nsS8Q0jTNOt2+Y/YpidzcdV8pB0757U6Tw/YyXEs268jeZ97iG/njUt67VcDt6VasrGKwjZIHuGDHJ8+5kmP4F2JFNbC5Xe5hanp8zeJJ7ptP1K6hktokRrG9EGGVnJDDzUJ+8Mde9MkhnuNY0eJft2llEnC+ZLHNKVAT7zN5g5+pPuK6moZLWGS6iuXTM0IZY2yeA2M8fgKS0G463Od1Vk0rVJoRrkGlw6mGmc3Ma/KwCq3luXXaxBBwQ3IJ9qm0670dtYtotKvo7pbPTnj227ibCBk6lSTnjpjnmtW+0m11CaOW489ZIlKq8FzJCQDjIyjDI4HX0ptno1nY3RuYftDzFDHvnu5ZsKSCQN7HHIHShaf16pCad/68mc43ktbjT/tOo/2UH3fZxolz5pXO7y/M2425/2c44z3ra0SY3GoapKYpId80Z8uUYZf3ScEVsVFFbRQzTSxrh52DSHJ+YgAD9AKBpanLeJby4TUgYINQvI41CG2gF3bhWJ5cSRIQ4wehPG3jJOKbafabzVNFie8vY5obe43ztb+W0nMfy4lTJAGBuwCcZznNdhUL2sMl5FdOmZoVZEbJ4DYzx0/hH5ULQHG7uc/qMEU+ovb30V7q92qiaOO02wrZqWIVlJdcOcddxbg4wCRS6RY211q15c3CzLqUUUcW67gi+0QDawDh1yp3ZP3eOMH0rYvNIs7+dZ50kSZV2CWCd4XK5ztLIQSM84PFSWWnW2nq4tkYNIcvJJI0jue252JY46DJ4FC2sFveucleyLYagbXT7KSWeykDNeI9y0zMyqW8wpbup3DGQSeMYxgY09Oe5vNL1K6IudKme4MhYA/NiNRkebCCF4x9wnIOK0Z9AsZ7uW5Y3ccsxBkMF7NEGIAAOEcDoAOlWLfToLa2kt0aeSOTO7z7mSU8jHV2JH4Ua28wSfN5HnJtpZpftosnllc+aJhYZZj13bv7O6985r0HRRcnSoZbya5kmmRZGW5VA8RIHyfKijj3GagTw1YRoqRy6iqqMKq6ncgAen+srThiWCFIkLlUGAXcu34sSSfqaelrImMWndnPSaTHdanPFNcs+rpGs4uzCPLWNi6iIJnlMBgVJ5znOcYs2en2eg6lf3SQWunWDQQ5dAkSbgX3E4xjqvJq5eaLZ3139pm+0JNsEZeC6lhJUEkA7GGeSevrUllpkFgztBJdOXGD593LMPwDscfhSWxTWpxOoavbDU2X+2bK9F1K5inTX5LVYFxkKyR5UYxgHqx610Iv5LvwzLFo+rwapqMMSiSa0eMsTnkhclQSAcZ4zXQUUdLAk73ORl3fYtT/s/+0fsH9nS+b/aHnZ83Hy7PO+bpuzj5enfNatvPcaXodqqLd6rcSqoiBVBg7ejMqhVUep5+pwK1Z4I7m3kgnXdHKhR1zjIIwRxTo0WKNY0GFUBVHoBR3/ruFtvn+hz+o2D2Hg7VDcSCW6uEea4kHQuQBgeigAAewrR8QWs194dv7W1TfNLAyouQNxI4GTxVy6tory1kt7lN8UqlXXJGR9RUtA7anIanLfLY65LNo95FFdWRAdpICI9sbA7gJCfyzTrCOaHQ9VD3sLRx3JNxJfWvnB08lMgohQfp07V1ckaTRPFMiyRuCrIwyGB6gjvVZtMs3tbq3MP7q7JMyhiN2VCnvxwAOMUdWLl28jmE8MSNqclt/Z3h0RLCsiz/ANhnaxJYFf8AW9RgHr3rT1aK4s7CLVLq/hiurEkedHbYiKOQCGQyZx0Od46Z9qtf8I7Zf89tS/8ABpc//HKu3FjBdWBs7gO8JUKf3rBuOnzZ3Z465zR0Eo2OXa+0b7FMsniGzvr28uoXc28iHJDqFVI9/AAA7k9Tz0rWvReWviNb2DTri9ha08k+Q8YKtvzzvde3pmpf+EbsCyl3vpArBwsuo3DqSDkZUuQeQOtatPz/AK2sNJ2szAnu7i61bSjcafPZKt023z3jLMfJkzwjMAOnf8KLKW/0ye/jOi3lwst3JKkkMkG1lOMfekB7elbUttFPLDJKm54HLxnJG0lSufyJqWl1uOxzunpc3HjC8nmkktGW1tzJbRsjq2TLgMxXPH+yR+NdETgZqFLSGO8lukTE0yqjtk8hc4GOn8R/OksrK3060S1s0McKElVLFsZJJ5JJ6k0AlY4m9vL59Uk8kao3myl471Yr2NbZeMKbcR7Hxz/vd8Vs6Wtxea5q91bXM9tkxhYZoV2kmIYZlIDjscbl9wDmukqGK1hhuJ54k2yXBDSNk/MQMD6cCjpYXLrc5kQxvctPaW2r397BIY5NSgeGMswPzR4dlBQYxtClc5I+bJqxpGjadc6G72jPH9qmkkuJYo/Ill/eMTE5xuGCSpwc8cda0pdAsJZ5JgLiBpW3OLa7lgV2/vFUYAn3xmrtvbQ2lslvaxLFEgwqIMAUdA5dbnE22rypN9r0zSdkMsQQx24u/KlAGFbH2TGQBgEY44OQBjUl8uDRtGZVvbO7toVaHFjLc7PkCskgRR2/3TkZ4rQj8MadDEscL38UajCompXCqo9ABJxWpDEsEKRIXKoMAu5dvxYkk/U0xKLucfNMpsryST7bc3d00Rmnewktoo1VxtVRIOnJ7sckk8V1t4jyWU0ccMU7OhXypXKK+eCCQDgfgaW5toruAw3C742IJGSOhyOnuKlpPUqOhxdpa6sdY+ySwR3K6csc0UE+pkxx7twQgi3DMV2n75PXPJ5Gvp141lpVzL9mmuJTfTKsNuu4sxkPGeAB/tHArXS0hjvJbpExNMqo7ZPIXOBjp/EfzpYLaK1V1gXaHdpG5JyzHJPPuaBKNjndPTUbe/vp9btCLi/izHLAxkihRVOIicDaRknd0Yk89BQLeS68M6PA8un/AGea3hQQ3tg1wHfZkdHUDp3H410zKHQqwyrDBFU59Is7iwhsnSRYbfb5QjmdGTaMDDKQ3T3o/wCB+ocv6/jb/IxYvCkkEySww+HY5EYMjpomCpHQg+dwa3LydLXS2fUL+Oz+QK91lY1Vjxkb8gc9Ac/jVePQLOKRZFm1AlSCA2pXDD8QXwfoa06HtYIxscg2q+Go7iPSv7R06axuIZJbieS8DO0qlApMm7O7GcHqNoxjFXJNQEGgtNomsw6jHbna7Oq3TtkgKmVkQZ56sST3PeujqG8tIb+0e2ulLRSAbgrlT1zwQQR07UdAs7nDmK+0YHUP7AsbPyRk3EekQBkB4Jyt3nv2rubZZ1t1F5JHLN/E8UZRT9FLMR+ZrNk8MadNGY5mv5Y2+8kmpXDK31BfBrXp30FGNmFFFFIsKKK5ie+1OTTb/Wre8aOOzkl8uy8tNkiRMQ25iN247WwQQBxwecgHT0Vl2dw0/iC7AdjF9lgdELcAsZMkD3wPypNak8vydup3drK+Vit7RImedvQB0bp68ADkkDmh6CvdXNWiuRs9avJl060nF49wl2q3U7+XHtJDHy2VSG4GBnYA2Mjg1vajbSEtcHWrnT4UX5ggh2D3JeNj+tAuY0KKxrL7XbeIXs5tRnvYvsol/fpECjb8cbFXqAevpSeJbq8tobBLB7hXnuxGwthEZGXY5wPN+UcqOtHb+vId9/L/AIc2qK5i4l1GDw7qktxJqsbpATG14bYEHnlTBz+ftjvV7XbqaO5tLa0k1ETyq7BLEW+WC7cljNxxuHT1oEpGzRXN2P8Abn9rWu/+1fsu5vtH277Ht27TjHlfNndj2qXxDHfWlnNc2etXkU0jCO3twkBQyMQFXmMsRk5POcZoDm0vY36KxBqMdv4wezu71EMtnF5ULyBd775MlVJ5PA6e1HiXUrvT7aEW3lwpM+x7uS4ES2/GQSWjdQDjbyOpA78HQd9zboril12+bT43mkM0EF/Av221uPtH2gFssoEcSBgBwQAfStu81a5i1ayW0tLm7hntZJDDGqI4IZMEiQqRgMRjrz0p2/r5XFzL+vWxtUVhf2vey69p9s+n3VjDKJS/nmFhJhcgDY7EY/CqV7qM0WtXcN9qerWSmYJaR2mniVJF8tWOG8l8nO/jPbpS6hzK1zqqKybSd31xE86aSM2COPOUoSdx+YrgYb14H0p+tSrDFEx1O5snJKpHbLGzzt/dCujZP0x3J4oHc06K49dXu0sbFJJry51CPUAtxakJHMFKuVQj5FYYA+b7rYJBrdu9VJ/0OxRm1F0B8vAIt8jhpCMgAemctg4zR0C6NOisnTtUdJY9M1g+XqIBCuV2pdAD76Hpkjkr1HPGME5TarqCaf8A28b12tvtnlmxWFWUReZ5XGFLl/4uuO2KBc2h1dFcv4dv57vUIS887xul4wWUsDxcgLlW5BA4wenSrXiDVIrO5sxHqmn288MvmSW13fC3EqFGXngnqQemOKOiYcy18jeorlNP8bw3bK1zPodtF5jI+dXBcBWI3BTGMg4yORkEVfaa91XUL1LDUDaR2W1E8tEcSuUD5bcD8uGUYXB689MAKSexuUVzWlatqWpajpc13BDbQXFrK4SG5Z9xGz7ylFAxzjk9a0Nbu54ZbC1guPsgvLjymuNqkp8rMAu7I3EgAZB+lA7q1zVorlru/u4dO160+3NctZQqyXQAWRWYElWKADcMA8AcMPqdXVjfRXmn3Flbz3MUUj+fDBIilgUIHDMoODjvQLmNSis+31K6nuFjl0W+t1brLK8BVfrtkJ/IVneJ55dOtHu49ZuraWUiK2tkEG15Two+eMnryeeBmgd9LnQ0VkGWa31qyiurksq2ErTMTtVmVo8uR0HU/TJrjtU1pJtYu3h1SHyDJ+6MOqfKy4HOPtsYHOeAo/Gj+vxsS5WVz0iiuZ8G6hBPaTW7amt1cGUyCJrlJWRMKOMTSnbn1bqfpV/UdSurPXLWC3tZ7yOS3ldooDGDkMgDZdl45I4PfpTtrYaldXNeisL+172XXtPtn0+6sYZRKX88wsJMLkAbHYjH4UX2tzC/T+zoZLi0s5CL+SJd2OMbV4yxUncwXkBcdeKQ7m7RWVHeC58Q2htrjzLWWxkkXY+Uf50w3oeCefeqXivUhp5stuuf2a0s6IyboRujLAM/zqTwO/Qd6O3n/nYXMrN9v8rnRUVxllrJutJvfL11r+aO9RF2vFlIxMqg/u1H3ge/Xt3rb1O6uW1qz0yG7FilxE8nnqqmR2Uj5E3AqDgknIPAOAOoOwcys2bFFYsFxc2XiCHTZL9tQWaF5X81EEsGCACdgUbTkjkZz3PQQ63Hf2ipJZ61drPcXCRwW5jgKZZuR/q9xAXJ65wOtA76XOgorEttRjTxfqFjcXiK7RQmC3eUAnhyxVSfYZxUmqXNw+sWWmw3hsVuI5JDMiqXYrtwi7wR/ESeDwv40BfQ16K5kajdSafNG115xtdUhtluY/lMq7487sYGfmKnHHB4HSpNX8R263Uumwalp9k+3bLdXF5Gpiz2VM7i3+9tA4PPSjp/Xk/1C66nRUVzOk+I7aK5h0yfVdPv1OEgu4r2Mu/YCRC2dx4GV3ZPOF6Vq6PdTXX27z33+VeSRJwBhRjA4piUkzRorFubqeHUdYMcrDybCOSME5Ct+95APHYflT9ItLxre0u7nWLy43xK7QukAQkr/sxg9/WkNv8Ar+vU16KxPDGox3thLEbxLi5huJhKhlDPGPNcKCM5HA4z2rboBO4UUUUDCiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigArDuPD08q3FpFfiPTLqQvNb+TlxuOXVX3ABWOc5Unk4I4xuUUA9TNtoXTxHev5bLEbaBUbb8pIMmQD7ZH51Pd6etwxlgmazuSApuYI4zIVHO3Lq3GTnpVuigVjDuNPvre6sZP7TvL5BcrvjmhgKquD82VjBGPXNN1q31zUtPurGGz09Y5gVWV7184zwSvlfpn8a3qKAaMm2TVf7S+0XGnWMfmKsckiX8jsEBJGFMQHVj3FSazpkuqQpCv8AZ7RKdzJfWRuAT2IG9cHr69a0qKAscafCtxpPhu6gtms3P2YoRZ6d5UtwcYG9tzFuueADn8jtavZXF/MEk0TStQgj5ja9nIYE9fl8pgPzrYopt3EopbHJaN4fu9Ihg2eH9Ca5iJxcrcFX5J7+Rnocda3ItKZtUa/v7g3MiE/Zo9m1LdSMcDnLHux+gwCQdGigFFIy4oZB4tuZjGwiayiUPtO0kPISM+vI/Ol1nRzqsIEVxJBIBtz5swQr3BSORM/UmtOil0sUch/wj17pkliwmS9gS5hXyALoiNQw+YBrhlG3H939K1dWsLjULjEuh6RqEUf+qe8nO4Z6/L5LY/A9q2qKN1qTypbHK6Fod7osFssWhaIJ44xG93FcMsjjuf8AUZ59M0ajYWUGuqL6HVpIBH50UsE17KVlJYEDYxC/KfQdTXVUU763DlVrGFo62Z1R5LNtRwINm29guB/FnPmTDnr0zVnW1uIbRrvTbdWuxiNpliDyJEWG8qD1IHIXnJHQ9K1KKQ7HMW8tzPqlmLe41HUI1kzKupacIViXB+dWMUfzA8YG7OTwOo0r861KtxBbWNg0TqyJJJeurYIxkqIjj6ZrVoodmrAk1qYulprlnZ2dnNY6eY4Y0ieRL5ycAAEhfJ68dM/jTx4dthd+Ybi5a3Fx9pFmWXyhLnO7pu+982N2M84rXopt3dxKKSsc5o1hdWmsRm4hZBsuzu6j57gMvI4yV5xV/wARNqSaRI+khHkH30aN2ZkPDbdrqQwGTwcnGBzWpRS6JDtq33OS0EaqmrCO3nklsim64lu7S7Qgg8KonmPUFuVBxgZHIrYutKujeTz6bfLafalAnDweZyBgMh3Da2OMncOBxxzq0UPUSjYwLbQbLSdc086Zp8cKLbypJNHEAW+5jewHJOD19609VaEac63Fi1+khC/ZhEJPMOeAQeAM9zgD1q5RQ9RpJbHJQJqdtpEGlRaTGJYZC92sUKLbyxZyVT5QpZs4xgYwc44Jtaoml3E1lfXmhJdR3GRM8ultLMgC/KCoUsOeORXR0UC5Tmrey8K3NwkMfh2NWY4Bk0R41H1ZowB+JrTbQrKa8nub1WvHmUxgXGGWKMjBRFxgA9+57k8VpUUAkY1vp72Wt2KI1xPDFaTIJZjuIy8ZClu/AIGecDv1rB1BLmXVrwyXN/bATEIsdpqMqsuByGilCevAArt6KP6/G4OKasYvhiJ4rCcSXd1dFpiwNzbzxFBtHygTFmI4znJ6mjVrC41C4xLoekahFH/qnvJzuGevy+S2PwPatqih6glZWOV0LQ73RYLZYtC0QTxxiN7uK4ZZHHc/6jPPpmpPFIuWvrNImuoYTHIXmgiu5cMCuFKwOvXJ5OeldNRQ9XcOXSxy/huGSPVJHe/vp18kjyprS8iTO4fNundhntgYPJrW8QtOnh+6a0SSSYKNqxeZu6jp5ZDfkRWlRQ9UEVY4SG3m+0wn+1dTXbIrHGnanyAwOPnlK4PTkEc1u65Y6pqcsMK2GnT2UU4kZLi6YeeApG1k8ogckHqfuj8N6imJRtc5vS9N1XS9RnktdL0q1tJxGDb292yqhXO5wBCASQR6fdHNadrpRTUGvr+4N3c8rESm1IEJ+6i84J4yxJJx2HFaNFIajYyrKGRPE2qytG6xyRwBHKnDYD5we+Mina8iT6cbY6et/LMdsMckIeNXxwzkghQOuT9Bk8Vp0UPUpaHLJNqENrY266U3k6cAb2NYFAkKjC+SMYbn5/lxjAHX5as6trOoWOo27WdnJc2stuWIaGYbWyMZ2ROwOOxAroKKd9bk8tlZHO6TrOqalryxz2T2tots5b93MFZ9y4+aSKM5xu4Gauf2FJHPPJaaxfWqzymVoo1hKhj1xujJ7eta1FILdzEttMcalqMFxJcTRTWcUZuJcbnJaXdyABkbugGBxxUkGhTQxRwnW9SeCMBREfJXIHQbljDduxrXooHZGHpUsml+G5JZ7S5dkuJ28mKItIwMzYwvfgg/StyiigFoFFFFAwooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooAKKKKACiiigAooooA//9k=)

(참고 자료 - <https://blog.naver.com/animalandhuman/221152328930>, 나응식 수의사)

- 밀폐형의 구형 구조를 지닌 기존 대다수의 제품은 디자인적 측면과 악취 예방에 좀 더 효과적이지만 개방형 구조를 선호하는 고양이에게 악영향을 줄 수 있다. 또한 복잡한 구형 구조로 인해 설계 및 제작의 난이도가 올라가 제품의 가격을 상승시키는 요인이 된다.

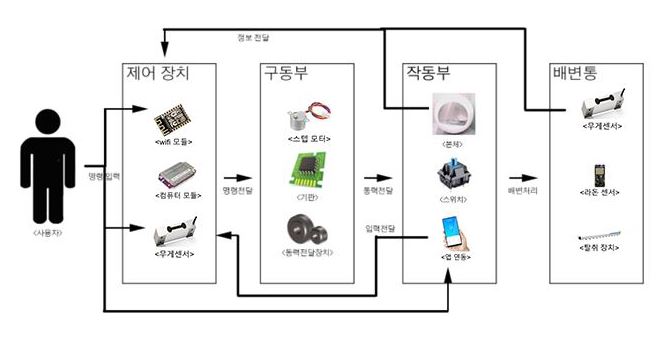
그에 비해 우리 제품은 개방된 판형 구조로 고양이가 받는 스트레스를 줄일 수 있고, 단순한 판형 디자인과 단순회전운동을 통한 배변처리방식으로 작동해 제작의 효율성이 높아져 제품의 가격을 절감시킬 수 있을 것이라 예상한다.

(참고 자료 – <https://www.quora.com/Do-cats-prefer-open-or-closed-litter-boxes> , https://www.litter-robot.com/blog/why-do-cats-use-litter-boxes/)

II. 프로젝트 내용

1. 구성도

ㅇ



- 제어장치

|  |  |  |
| --- | --- | --- |
| **명칭** | **기능** | **설명** |
| Wifi 모듈 | 네트워크를 통해 사용자의 입력, 출력을 담당 | 네트워크를 통해 사용자에게 입력을 받고 컴퓨터 모듈로 명령을 전달함  컴퓨터 모듈에서 받은 정보를 네트워크를 통해 다시 사용자에게 전달함 |
| 컴퓨터 모듈 | 정보 취합 후 출력 | 해당 기기의 본체에 해당  모든 정보를 받고 취합하여 각 모듈로 전달  모든 명령과 정보 처리를 담당 |
| 무게센서 | 무게 측정으로  고양이의 출입 감지 | 고양이의 출입 감지 시 제품 작동 시작 및 종료 |

- 구동부

|  |  |  |
| --- | --- | --- |
| **명칭** | **기능** | **설명** |
| 스텝 모터 | 전원을 받고 동력을 생성함 | 전기를 통해 동력을 생성하는 역할  컴퓨터 모듈에서 받은 명령을 단순수행 |
| 기판 | 제어창에서 명령을 받고 구동부를 작동시킴 | 제어장치를 포함, 명령을 전달하는 기판  모터를 돌리게 하고 동력전달장치를 가동시킴  또한 정지를 관여함 |
| 동력전달장치 | 모터에서 발생된 운동에너지를 작동부로 전달함 | 모터에서 받은 동력을 작동부로 전달시킴 |

- 작동부

|  |  |  |
| --- | --- | --- |
| **명칭** | **기능** | **설명** |
| 본체 | 동력을 받아 회전 | 동력 전달 장치로부터 동력을 전달받아  회전함으로써 내부의 배변을 걸러냄 |
| 스위치 | 사용자의 직접 입력을 받음 | 외부에 돌출된 기계식 버튼의 스위치  사용자의 입력을 직접 받아 컴퓨터 모듈로 전달 |
| 앱 연동 | 라돈 수치측정 | 앱 연동을 통해 핸드폰 등의 기기로 제품의 배변처리 등을 제품과 떨어져 있을 때 원격으로 제어하게 해주며, 산출된 무게와 라돈 수치 등을 가시화 |

- 배변통

|  |  |  |
| --- | --- | --- |
| **명칭** | **기능** | **설명** |
| 무게센서 | 무게를 측정 | 고양이 및 변의 무게를 감지하여 화장실의 내부 상황 파악 및 간단한 검진 가능 |
| 탈취 필터 | 배변의 악취 억제 | 배변의 악취를 억제하는 필터 |
| 라돈 센서 | 라돈 수치측정 | 모래에서 발생하는 라돈 수치를 측정함 |

2. 주요기능

ㅇ 전체 기능 목록

|  |  |  |  |
| --- | --- | --- | --- |
| **구분** | **기능** | **설명** | **현재진척도(%)** |
| S/W | IoT | 원격으로 제품에 대한 접근, 조작을 사용자에게 제공 |  |
| H/W | 고양이 출입 감지 | 고양이의 출입을 감지하여 제품의 작동 제어 |  |
| 배변처리 | 판이 회전하면서 모래 속에 있는 배변을 분리하고 배변통으로 배출함 |  |
| 모래 평탄화 | 판 안의 배변용 모래를 판의 회전을 통해 평탄화 |  |
| 라돈 측정 | 배변용 모래에서 검출되는 라돈의 수치 측정 |  |
| 무게 측정 | 고양이와 변의 무게를 측정 |  |
|  | 탈취 필터 | 배변의 악취 억제 |  |

ㅇ S/W 주요 기능

|  |  |
| --- | --- |
| **기능** | **설명** |
| IoT | Wifi모듈, 컴퓨터 모듈과의 연결로 핸드폰 등의 기기를 통한 제품의 자동제어, 원격제어 부여. 무게와 라돈 수치 등 산출된 정보를 가시화 |

ㅇ H/W 주요 기능

|  |  |
| --- | --- |
| **기능/부품** | **설명** |
| 컴퓨터 모듈 | 제품의 구동부, 센서와 결합하여 고양이의 출입을 통한 제품의 작동 자동제어 |
| 모터 및 동력전달장치 | 모터의 동력을 통한 제품의 다양한 각도의 회전운동을 통해 배변처리 및 모래 평탄화 진행 |
| 무게센서 | 무게측정을 통해 고양이의 출입을 감지  고양이와 변의 잔류를 무게 측정을 통해 확인할 수 있으며 그 신호에 의해 반복 작동 필요 판단.  고양이와 변의 무게 측정을 통한 간단한 검진 가능 |
| 라돈 센서 | 배변용 모래의 라돈 수치를 측정하여 모래의 교체 필요성 확인 및 사고 예방 |
| 탈취 필터 | 배변의 악취를 억제하여 외부로의 유출 방지 |

3. 적용기술

ㅇ 모터와 기어의 동력전달에 의한 회전운동을 이용한 배변처리와 모래 평탄화

ㅇ 무게센서, 라돈 센서의 측정을 컴퓨터 모듈에 전달하고 그것을 신호로 하여 제품의 자동제어 수행

ㅇ Wifi 모듈과 컴퓨터 모듈의 연결을 통한 앱 연동으로 사용자에게 핸드폰 등을 통한 제품의 원격제어 및 센서에서 산출된 정보의 가시화 제공

4. 예상 결과물

|  |  |
| --- | --- |
| **예상 결과물 이미지** | **설명** |
| 별첨1. | 제품의 완성품으로 구동 시 상단의 판의 회전으로 첫 회전 시 90 ° 각도로 회전하여 변을 하단의 배변통으로 거르고 모래를 홈 뒤편의 공간으로 분리시킨 뒤 다음 회전 시 90 °미만의 각도로 회전하여 모래를 다시 판으로 가져온다. 마지막 회전 시 모래를 평탄화 한다.  (참고 동영상 https://www.youtube.com/watch?v=ReGhS7GVbm0) |
| 별첨2. | 제품의 구동부로 위 완성품의 회전운동을 담당하는 부분이다. 모터와 수직으로 배치된 기어들이 힘을 전달하고 마지막으로 회전판 측면의 기어 이빨이 힘을 받아 판을 회전시킨다. 기어의 규격 및 개수는 완성품의 정확한 규격과 모터의 출력 등을 기반으로 하여 결정할 예정이다. |

III. 프로젝트 수행내용

1. 프로젝트 수행일정

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **프로젝트 기간 (한이음 사이트 기준)** | | **2020.04.12. ~ 2020.10.28.** | | | | | | | | | | | |
|  | | | | | | | | | | | | | |
| **구분** | **추진내용** | **프로젝트 기간** | | | | | | | | | | | |
| **1월** | **2월** | **3월** | **4월** | **5월** | **6월** | **7월** | **8월** | **9월** | **10월** | **11월** | **12월** |
| 계획 | 조원 구성 및 역할분담, 일정 협의 및 일정표 작성, 제품 사전조사, 제품 사전조사, 수행계획서 작성 |  |  | ㅇ | ㅇ |  |  |  |  |  |  |  |  |
| 분석 | 구현여부확인, 제품 필수기능 설정, 제품디자인 외형 설정, 제품의 구동방식 확인, 시제품 비교군 탐색, 수정보안점 확인 |  |  |  | ㅇ | ㅇ |  |  |  |  |  |  |  |
| 설계 | 3D도면 제작 및 검수 |  |  |  |  | ㅇ | ㅇ |  |  |  |  |  |  |
| 2D도면 제작 및 검수 |  |  |  |  | ㅇ | ㅇ |  |  |  |  |  |  |
| 개발 | 3D프린터를 활용한 시안 제작 |  |  |  |  |  | ㅇ | ㅇ |  |  |  |  |  |
| 제품 검증 및 시제품 재료 구매 |  |  |  |  |  |  | ㅇ | ㅇ |  |  |  |  |
| 시제품 제작 |  |  |  |  |  |  | ㅇ | ㅇ | ㅇ |  |  |  |
| 테스트 | 시제품 구동확인 및 오류수정 |  |  |  |  |  |  |  |  | ㅇ | ㅇ |  |  |
| 종료 | 프로젝트 최종보고 및 종료 |  |  |  |  |  |  |  |  |  | ㅇ | ㅇ |  |

2. 프로젝트 수행 과정에서의 문제점 및 애로사항

ㅇ 제품의 구조와 구동에 필요한 지식 부족

ㅇ IoT기술을 접목시키기 위한 아두이노 코딩의 이해 부족

ㅇ 신청 자재의 품절 및 배송 지연으로 인한 일정 지연

VI. 기대효과 및 개선사항

1. 기대효과

ㅇ

<표 8> 반려동물 월평균 양육비용(농림축산식품부)

텍스트이(가) 표시된 사진

자동 생성된 설명<참고 기사-연합뉴스>

반려인들의 반려동물 양육 시 애로사항 1, 2위가 위생 관리, 지출 문제로 꼽히고 있는데 우리 제품은 언제든지 배변처리, 소결 등이 가능하기 때문에 위생 관리에 유리하다. 또한 반려묘 및 변의 무게 측정, 배변용 모래의 라돈 수치 측정을 통해 간단한 검진을 할 수 있어 반려묘의 병원비 지출도 낮출 수 있다. 이러한 점으로 가정과 요즘 많아지고 있는 펫 카페 등 다중시설에서의 구비가 손쉬워져 결과적으로 자동화장실 보급에 탄력을 줄 수 있을 것이라 생각한다.

2. 개선사항

ㅇ 초안의 음성인식기술 적용을 원가절감과 제작의 용이성 등을 위해 배제시킴.

ㅇ 기존의 초음파센서를 통한 출입감지 방식을 제작의 용이성 등을 위해 배제시킴

ㅇ

별첨.

II. 프로젝트 내용. 4. 예상 결과물

별첨1.

*컨테이너이(가) 표시된 사진

자동 생성된 설명*텍스트이(가) 표시된 사진

자동 생성된 설명

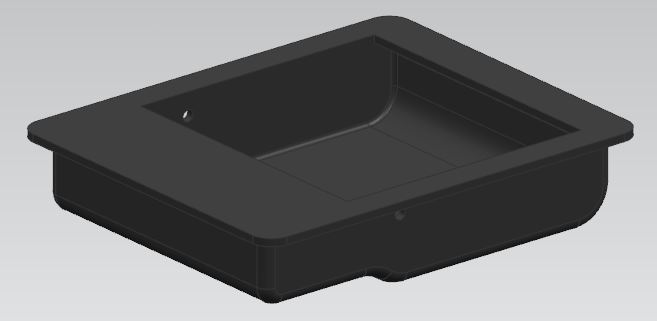
완성품

테이블, 손수레, 작업대이(가) 표시된 사진

자동 생성된 설명실내이(가) 표시된 사진

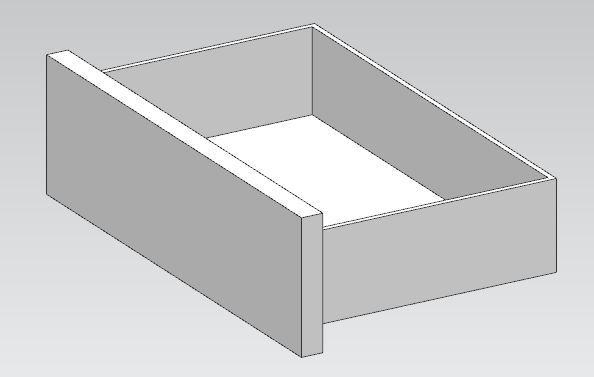
자동 생성된 설명

본체

실내이(가) 표시된 사진

자동 생성된 설명

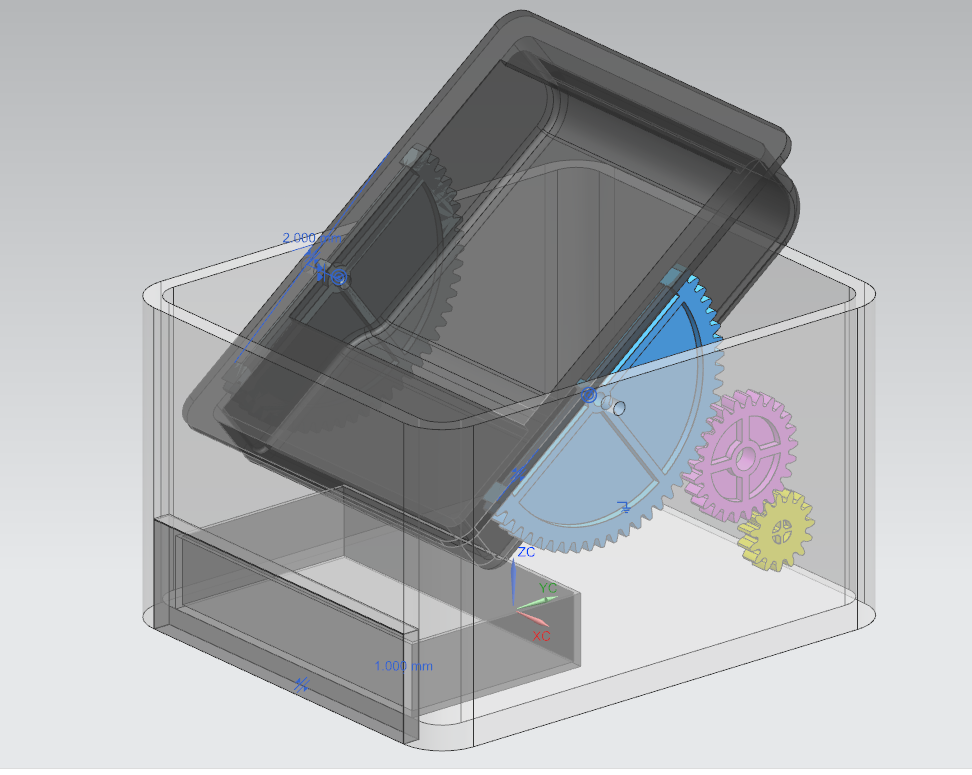
모래통

욕실, 실내, 하얀색, 싱크이(가) 표시된 사진

자동 생성된 설명

배변통

별첨2.



**2**

**3**

**1**

제품 내부 배치도(1 – 상단기어 2 – 중간기어 3 – 하단기어)

전자기기이(가) 표시된 사진

자동 생성된 설명

하단 기어+모터